MAY 2010

Stanford University Medical Center Facilities Renewal and Replacement

Draft Environmental Impact Report

Prepared for
The City of Palo Alto

SCH # 2007082130

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Summary

S.1 PROJECT OVERVIEW AND PROJECT LOCATION

This Environmental Impact Report (EIR) addresses the Stanford University Medical Center Facilities Renewal and Replacement Project (SUMC Project). The SUMC Project involves demolition, replacement, and expansion of existing medical facilities at the SUMC Sites, which are comprised of the 56-acre Main SUMC Site and 9.9-acre Hoover Pavilion Site. The SUMC Project would demolish approximately 1.2 million square feet of existing buildings at the SUMC Sites and construct approximately 2.5 million square feet of hospital, clinic, and research facilities, for a net increase of about 1.3 million square feet of hospital and clinic uses (research space would not increase). In addition, other existing buildings would be renovated to meet seismic standards, and approximately 2,053 net new parking spaces would be added to the sites. The SUMC Project sponsors are the Stanford Hospitals and Clinics (SHC), the Lucile Packard Children's Hospital (LPCH) and the Stanford University School of Medicine (SoM).

The SUMC Sites are within an area that is generally bounded to the north by San Francisquito Creek, to the east by El Camino Real, and to the south and west by unincorporated Santa Clara County (containing Stanford University lands). Regional access to the SUMC Sites are via: Interstate 280 (I-280), roughly 1.9 miles to the west; US Highway 101 (US 101), roughly 1.8 miles to the east; and State Route 82 (El Camino Real) just east of the SUMC Sites. Access to the SUMC sites is also available via Caltrain; the nearest Caltrain station is about 1,200 feet east of the Hoover Pavilion Site and 3,400 feet east of the Main SUMC Site (with connections via the Marguerite shuttle). Figure 2-1, in Section 2, Project Description, depicts the location of the SUMC Sites.

S.2 PROJECT OBJECTIVES

The SUMC Project sponsors have identified various objectives for the SUMC Project. In this EIR, the following objectives were considered when developing mitigation measures and alternatives to the SUMC Project. These objectives are divided into three categories: Program, Siting, and Circulation. The Program objectives are further sub-divided by entity (SHC, LPCH, and SoM).

Program Objectives

SHC and LPCH. The Program objectives of SHC and LPCH are listed below.

- Optimize delivery of healthcare and services to patients.
- Maintain each hospitals' position as a leading provider of complex care.

- Achieve timely compliance with the requirements of Senate Bill 1953[1] and other applicable code requirements:
  - Replace the SHC portion of the 1959 Hospital Building complex (the 1959 Hospital Building complex is also referred to as the Stone Building complex), comprising 188 beds, in its entirety;
  - Meet SB 1953's 2013 non-structural criteria for all 66 intensive care beds at SHC, the Emergency Department (ED), and the 21 operating rooms at SHC in the most efficient manner;
  - Complete required non-structural renovations[2] to critical areas at LPCH;
  - Provide sufficient space for patients and families during construction of required renovations or replacements;
  - Meet SB 1953's 2030 criteria in the most efficient manner; and
  - Design new facilities to comply with applicable ventilation and structural requirements.
- Meet existing and projected future demand for patient care:[3]
  - Relieve the existing shortages of beds at SHC and LPCH;
  - Provide additional patient rooms and facilities at SHC to meet the projected needs of an aging population;
  - Provide additional patient rooms and facilities at LPCH to meet projected growing demand for LPCH services;
  - Size the ED to provide adequate patient waiting and triage space, and trauma rooms consistent with contemporary facility standards;
  - Meet existing and projected demand for clinic and other outpatient services that are important to the core academic and translational discovery process,[4] or that otherwise should remain co-located with inpatient services; and
  - Provide sufficient space to replace medical offices removed due to demolition, and to accommodate increased space for both medical offices and support services due to existing and projected future growth in need for patient services.

[1] Please see Section 2.5, "Seismic Safety," for a description of SB 1953 and its requirements.

[2] Non-structural renovations consist of securing interior fixtures, ceilings, sprinkler systems, bracing, and duct work in the event of an earthquake. Such renovations are required for all critical care areas by 2013.

[3] A description of the existing demand for healthcare and the current deficit of available space to accommodate those demands is presented in Section 2.5, under the "Spatial Constraints" heading.

[4] Translational Resources: To improve human health, scientific discoveries must be translated into practical applications. Such discoveries typically begin at "the bench" with basic research — in which scientists study disease at a molecular or cellular level — then progress to the clinical level, or the patient's "bedside." Scientists are increasingly aware that this bench-to-bedside approach to translational research is really a two-way street. Basic scientists provide clinicians with new tools for use in patients and for assessment of their impact, and clinical researchers make novel observations about the nature and progression of disease that often stimulate basic investigations. Source: SoM, April 2008.

- Provide modern, state-of-the-art facilities, designed to deliver high quality healthcare services and related teaching and research:
  - Size facilities to accommodate advanced medical services, state-of-the-art imaging, modern diagnostic and other medical equipment, and to provide sufficient space for high quality patient care and associated support services;
  - Design facilities to enhance the comfort and healing of patients and the productive care-giving and general welfare of staff and visitors;
  - Meet current hospital planning guidelines by providing space to accommodate patients in single-bed rooms as appropriate, including adequate space for treatment by healthcare providers, equipment and support by family members;
  - Minimize the distance of travel from procedure room to patient room;
  - Provide a safe, secure, and efficient route from operating rooms or the ED to patient rooms; and
  - Minimize patients' risk of infection.
- Meet regional needs for emergency and disaster preparedness:
  - Design facilities to take into account needs identified in the region's Disaster Preparedness Program, such as the ability to quickly add or convert beds and procedure rooms to manage critically injured patients for mass population events such as earthquakes, pandemics (influenza), or man-made biological/chemical exposure (bioterrorism, etc); and
  - Design facilities to maintain and further SUMC's role as a Level 1 Trauma Center for daily and extreme-disaster healthcare delivery.
- Maintain relationships with community physicians:
  - Identify replacement space for community physicians who must relocate their medical offices to accommodate demolition of facilities due to the SUMC Project.
- Provide responsible and sustainable design for the hospitals' operational systems, water systems, and use of physical materials, while meeting applicable requirements and hospital planning principles, including those applicable to infection control and patient safety.
- Allow sufficient design and entitlement flexibility to be able to adapt to changes in healthcare needs, changes in technology, and changes in delivery practices.

SoM Objectives. The Program objectives of the SoM are listed below.

- Optimize the SoM's ability to translate medical research discoveries into treatments and cures.
- Replace outmoded research buildings with state-of-the-art research facilities to support contemporary translational research:
  - Design facilities to comply with code requirements for strong and reliable fire separations;

- Design research facilities to efficiently meet current building requirements, including those pertaining to: seismic safety; heating, ventilation, and air conditioning; mechanical, electrical, and plumbing (MEP) systems; and provision of emergency power;
- Design circulation and access to laboratories and offices to enhance handicapped accessibility, and to allow for safe and efficient access to a diverse array of laboratory and support functions; and
- Employ best available design techniques to provide for efficient, high quality facilities.

- Provide sufficient faculty offices, research laboratories, and administrative support space to meet the SoM's projected needs.
- Provide responsible and sustainable design for the SoM's operational systems, water systems, and use of physical materials, consistent with Stanford University's existing sustainability practices.
- Allow sufficient design and entitlement flexibility to be able to adapt to changes in medical research needs and changes in technology.

Siting Objectives

- Site facilities to maximize highest and best use of SUMC and Stanford University lands.
- Site SHC and LPCH facilities to efficiently use a single, shared ED.
- Locate patient beds, ED, and SoM facilities in close proximity to each other to maintain and enhance program synergies and connections.
- Locate outpatient healthcare facilities that are important to the core academic and translational discovery process in close proximity to inpatient facilities.
- Site parking facilities for patients and visitors to provide clear, safe, and convenient access to SUMC facilities, with sensitivity to the needs of elderly, limited mobility, and ill patients.
- Site parking facilities for staff with consideration of safe paths of travel after dark.
- Locate new clinical, medical office, and support facilities for hospital staff and community physicians within reasonably close proximity to SHC and LPCH facilities.
- Optimize department adjacencies that ensure the healthcare facilities are clinically safe environments, promote safe and efficient patient flow, and provide access to state-of-the-art technology.
- Use the existing SUMC Sites in Palo Alto for all components of the SUMC Project.
- Arrange the buildings, open space areas, and infrastructure within the SUMC Project boundaries to create a highly functional medical center environment.

Circulation and Parking Objectives

- Provide clear, safe, and convenient access to SUMC facilities for patients and visitors.
- Provide efficient access to SUMC for healthcare providers and staff.
- Provide sufficient convenient parking for patients, visitors, healthcare providers and staff, with sensitivity to the needs of elderly, limited mobility, and ill patients.
- Enhance the pedestrian and bicycle connections within and between the SUMC, the Stanford Shopping Center, the Palo Alto Intermodal Transit Station (PAITS), and nearby open space areas.
- Provide improved way finding to minimize unnecessary circulation.

Cost Objective

- Select methods of construction to minimize the initial cost to the greatest extent feasible while producing facilities that are cost effective to operate over the long term.

City Objectives

In addition to the SUMC Project sponsor's objectives, the City has identified the following objectives for the SUMC Project:

- Provide high quality employment districts, each with its own distinctive character and each contributing to the character of the City as a whole.
- Employ state-of-the-art urban design principles and ensure adequate design review of the SUMC Project.
- Create a more walkable, bikeable, mixed-use, transit-oriented, and well-connected urban environment that captures the potential travel behavior, air quality, and greenhouse gas reduction benefits associated with the performance of well-designed urban villages.
- Create walkable and bikeable connections that link together Stanford University Medical Center, Stanford University, PAITS, downtown, Stanford Shopping Center, and surrounding residential neighborhoods.
- Promote sustainable development and green building design principles through thoughtful urban planning and site design, building design and construction, energy production and conservation, and utility and transportation infrastructure design and construction, in a manner that improves the City's economic health, and improves the quality of life in the City.
- Promote development that contributes to the design and implementation of comprehensive solutions to traffic problems near Stanford Medical Center and key connections.
- Encourage employment districts to develop in a way that encourages transit, pedestrian and bicycle travel and reduces the number of auto trips for daily errands.

- In conjunction with new development proposals, create new park, open space, recreation, plaza, or other public gathering spaces.
- Provide for long-term utility and public infrastructure demands generated by the SUMC Project.
- Address project-induced school impacts not mitigated by school impact fees.
- Minimize environmental, financial, and municipal infrastructure impacts of the SUMC Project on the City.
- Assist Stanford University Medical Center in responding to changes in the delivery of healthcare services. Work with the SUMC to plan for changing facility needs, but within the context of City of Palo Alto planning goals and policies, as well as the goals and policies of other relevant jurisdictions.
- Support Stanford University's historic campus identity as "a place apart" with a "sense of higher purpose" as well as Stanford's commitment to innovative, high quality of design through their "interpretive approach to contextual design" in the architecture of campus buildings and the landscape.
- Identify and implement strategies for accomplishing housing with a focus on below-market-rate residential units that would be available to help accommodate employment generated by the SUMC Project.
- Locate work force housing close to SUMC Sites and train station in order to reduce traffic trips of both employees and employee household members.
- Encourage public and private upkeep and preservation of resources that have historic merit.
- Optimize delivery of healthcare and services to patients and meet regional needs for emergency and disaster preparedness.

S.3 EXISTING SITE DEVELOPMENT

The approximately 66-acre SUMC Sites (the Main SUMC Site and the Hoover Pavilion Site) currently contain buildings used for hospital, clinic, and educational purposes and employs about 9,729 individuals. Approximately 70 percent of the total site area within the SUMC Sites consists of impervious surfaces, while 29 percent of the site area consists of pervious surfaces with an additional 3 percent of planted rooftops.[5]

Most of the Main SUMC Site and all of the Hoover Pavilion Site are within the jurisdiction of the City of Palo Alto; however, a 0.75-acre area at the northwest corner of the Main SUMC Site, just west of Pasteur Drive, is located in unincorporated Santa Clara County. Figure 2-2 in Section 2, Project Description, provides the existing land use designations for the SUMC Sites, per the *City of Palo Alto*

[5] Existing impervious/pervious area within the SUMC Sites is approximate.

1998 Comprehensive Plan (Comprehensive Plan). As shown in the figure, most of the Main SUMC Site and all of the Hoover Pavilion Site are within the Major Institution/Special Facilities land use designation, which allows institutional, academic, governmental, and community service uses on lands that are either publicly owned or operated by non-profit organizations. The southeast corner of the Main SUMC Site plus a strip of land between Sand Hill Road and Welch Road are under the Comprehensive Plan's Research/Office Park designation, which allows office and research establishments, as well as educational institutions. The Research/Office Park designation also allows manufacturing establishments whose operations are buffered from adjacent residential uses.

Most of the Main SUMC Site and all of the Hoover Pavilion Site are within the Public Facilities (PF) zoning district, which allows development of governmental, public utilities, educational, and community service or recreational facilities.[6] The southeast corner of the Main SUMC Site plus a strip of land between Sand Hill Road and Welch Road fall within the Medical Office and Research (MOR) district in the Zoning Map. The MOR district allows medical offices, medical research facilities, and some medical support services. A half-acre area at the northwest corner of the Main SUMC Site, just west of Pasteur Drive, is located in unincorporated Santa Clara County, and falls within the A-1 district in the County of Santa Clara Zoning Code. The A-1 district is an agricultural district, but academic uses are conditionally permitted in the A-1 district and the SoM has been granted a use permit allowing academic use of the site.

Main SUMC Site. As shown in Figure 2-5 and Table 2-1 in Section 2, Project Description, there are several structures, including three parking garages, currently on the Main SUMC Site. Of the 2.27 million square feet within the Main SUMC Site, about 1.39 million square feet are used by SHC for hospital and clinic purposes; 274,700 square feet are used by LPCH for hospital and clinic purposes; 467,200 square feet are used by SoM; and 132,600 square feet are jointly used by the hospitals and community practitioners located at 1101, 801, 701, and 703 Welch Road. The existing building footprints cover about 29 percent (approximately 686,000 square feet or 15 acres) of the Main SUMC Site.

Structures within the Main SUMC Site vary in height from approximately 15 feet to approximately 50 feet. Building heights do not include the height of roof-mounted mechanical equipment (e.g., heating and cooling units, vents, etc.).

Parking at the Main SUMC Site is provided in surface lots, above-ground garages, and underground garages. The on-site parking facilities that would be affected (demolished) by the SUMC Project include Parking Garage 3 to the east of Pasteur Drive and the Falk parking lot north of Quarry Road (see Figure 2-6 in Section 2, Project Description). As shown in Table 2-2 in Section 2, Parking Structure 3 contains 699 spaces, 671 of which are needed to meet current demand based on recent surveys. The Falk lot contains 130 spaces, 115 of which are needed to meet current demand. Thus, the

[6] City of Palo Alto, *Palo Alto Zoning Code, Section 18.32.030, Permitted Uses,* http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=8708, accessed February 10, 2010.

Main SUMC Site's parking facilities to be demolished include a total of 829 spaces, 786 of which are needed to meet current demand.[7]

Hoover Pavilion Site. As shown in Figure 2-5 in Section 2, Project Description, existing buildings dedicated to medical offices and clinics and other uses occupy the Hoover Pavilion Site. The site contains approximately 84,200 square feet within the Hoover Pavilion building; approximately 7,400 square feet within the Arboretum Children's Center; and approximately 13,800 square feet of miscellaneous shops and storage outside of the Hoover Pavilion building. The existing building footprints cover about 9 percent of the Hoover Pavilion Site.

Existing building heights within the Hoover Pavilion Site range from approximately 12 feet to 65 feet. Building heights do not include the height of roof-mounted mechanical equipment (e.g., heating and cooling units, vents, etc.).

Parking at the Hoover Pavilion Site is provided by Lot 1A, a surface parking lot that surrounds the Hoover Pavilion building. Lot 1A contains 273 spaces, of which 85 occupied surface parking spaces would be replaced.

S.4 CHANGES PROPOSED UNDER THE SUMC PROJECT[8]

Background

Seismic Safety. Several existing buildings at the SUMC Sites require structural retrofit or replacement to comply with health and safety codes, particularly California Senate Bill (SB) 1953, Safety Retrofitting. SB 1953 requires hospitals to retrofit or replace facilities that do not meet State-designated safety criteria. In addition, many of the facilities within SHC and LPCH require nonstructural renovations or replacement. Hospitals have the option of replacing or retrofitting designated non-compliant facilities to meet a January 1, 2013 deadline, with opportunity for extension.[9] Further requirements must be met by 2030. If a hospital does not comply with these mandates, the State can revoke the hospital's operating license. The Stanford Hospital, composed of buildings built between 1959, 1973, and 1989, does not meet the 2013 and 2030 safety requirements; therefore, significant portions of its facilities must be replaced or renovated. The SUMC Project sponsors have determined that in many cases it is more cost efficient and physically practical to demolish older, non-compliant buildings and to replace them with new facilities. The 1959 Hospital Building complex, comprising 188 beds, must be replaced in its entirety. All 66 intensive care beds, the ED, and the 21 operating rooms at Stanford Hospital do not meet 2013 non-structural criteria, and it is more efficient for the SHC to replace these facilities than to retrofit them.

7 Fehr and Peers, SUMC Trip Generation and Parking Demand Study, October 2008.

8 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended.

9 SHC has applied for the maximum two-year extension of the 2013 deadline provided by law. However, the extension is contingent upon meeting specified interim milestones, which cannot be met until construction is allowed to commence.

The LPCH facility meets the structural performance criteria for the 2030 deadline under SB 1953, but significant non-structural renovations to critical care areas are required by the 2013 deadline. In order to accomplish these renovations, LPCH needs replacement space for patients and families during construction.

In addition, the portions of the SoM that occupy the 1959 Hospital Building complex must either be physically separated from structures used for hospital purposes, or replaced, in order to comply with SB 1953 requirements. The SUMC Project sponsors propose to demolish and replace the SoM buildings occupying the 1959 Hospital Building complex.

New or replacement hospital structures must meet standards specified by California's building code for hospitals. Compared with the existing hospital buildings at the SUMC, compliance with these standards necessitate increased square footage and height to accommodate seismic structural requirements, air handling systems, and mechanical duct work.

Spatial Constraints The SHC is currently licensed to operate 613 inpatient beds; however, with current spatial constraints, it is only able to keep 456 beds operational. Spatial constraints restrict the SUMC's ability to serve new patients and expansions needed to provide the optimal level of care for existing patients. In fiscal year 2005, SHC had to turn away 500 adult patients because of a shortage of beds. Furthermore, due to an aging population, along with modest overall projected population growth in the surrounding community, the number of patients turned away is expected to increase unless additional patient beds are provided. With implementation of the SUMC Project, the SHC would strive to maintain 600 operational beds.

The LPCH is licensed to operate 257 beds, and all 257 beds are currently in use. The LPCH has an acute shortage of beds. In fiscal year 2005, the hospital was forced to turn away 200 critically ill children due to lack of beds. Similar to the SHC, modest population growth is expected to increase the number of children turned away unless additional patient rooms are provided. With implementation of the SUMC Project, the LPCH would seek to increase its licensed inpatient beds to 361 beds.

SHC and LPCH both suffer from an outmoded ratio of semi-private patient rooms to single-bed patient rooms. Approximately 60 percent of the patient beds at the SHC and LPCH are semi-private, yet the American Academy of Healthcare Architects recommends that all beds be in private rooms to ensure patient safety, privacy, and family centered care.[10] Currently, most SUMC rooms have two beds, but some rooms have three to four beds. Expansions thus need to be made for adequate space to provide sufficient beds and to meet current standards for bed and room provisions.

Outpatient Treatment. The SHC and LPCH current outpatient facilities (as well as administrative functions) are located on campus and at off-site locations. In order to accommodate the growing demand for outpatient services, the SHC needs to increase outpatient treatment areas off campus and over time on campus. There has been a relative shift of therapies and treatments to the outpatient setting due to advances in medical delivery technologies and the ability to treat and manage patients

[10] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 3.

with chronic conditions (asthma, cardiac conditions, etc.) as outpatients. This trend continues to grow as advances in medical technology allow for life-saving procedures such as heart and lung transplants, which often require monitoring and treatment of complications over time. To address this issue, the hospitals propose to construct approximately 479,000 square feet of new and replacement clinics on the Main SUMC Site (for an net increase of 50,924 square feet), as well as renovate the existing Hoover Pavilion building for use as clinics and medical offices. Further, the hospitals propose approximately 60,000 square feet of medical office/clinics for community practitioners and SUMC users at the Hoover Pavilion Site.

Modernization of Research Facilities. SoM proposes to replace, but not increase, its existing facilities in the 1959 Hospital Building complex to address seismic safety requirements and to bring the current facilities up to current industry standards for similar research facilities. To meet current industry standards, the research facilities of the SoM would need to provide (1) stronger and more reliable fire separations between laboratory and office areas, (2) greater volume of air for laboratory heating, ventilation, and air conditioning (HVAC) systems, and (3) increased ADA accessibility and enhanced support functions (e.g., tissue culture rooms, equipment rooms and computational facilities) in laboratories.

Entitlements

Changes to Comprehensive Plan. Existing Comprehensive Plan land use designations are provided in Figure 2-2 in the Section 2, Project Description. The SUMC Project sponsors have requested the following changes in land use designations at several locations identified in the City's Comprehensive Plan. The resultant land use designations are depicted in Figure 2-7 in the Section 2, Project Description.

- Change in land use designations at 701 and 703 Welch Road from the Research/Office Park land use designation to the Major Institution/Special Facilities land use designation.
- Annexation to Palo Alto of a 0.75-acre property within Santa Clara County jurisdiction with a Major Institution/Special Facilities land use designation to be applied to this property.

In addition, the SUMC Project sponsors have proposed changing the text associated with Program L-3 of the Comprehensive Plan. Program L-3 states that the City will maintain and periodically review height and density limits to discourage single uses that are inappropriate in size and scale to the surrounding uses. The discussion following Program L-3 refers to the City's historic 50-foot height limit. As proposed, some portions of the SUMC Project would exceed the current limit by approximately 80 feet. Accordingly, the SUMC Project sponsors propose that, in the event the SUMC Project is approved, the applicable Comprehensive Plan language be modified to identify the hospital zone as an exception to the 50-foot citywide limit due to the Medical Center's unique needs.

The City of Palo Alto staff has proposed an additional change to the Comprehensive Plan to clarify Policy L-8. Policy L-8 directs the City to maintain a limit of 3,257,900 square feet of new non-residential development within nine planning areas evaluated in a 1989 Citywide Land Use and Transportation Study. On a citywide basis, there is 1,944,090 square feet of development potential remaining under the Comprehensive Plan policy. However, non-residential development in the planning area in which a portion of the SUMC is located (Planning Area 9) has exceeded the anticipated growth for that area. However, as discussed further in Section 3.2, Land Use, City staff has suggested a modification of the text of this policy to specify that it is not meant to apply to hospital and treatment center uses.

Changes to Zoning Map and Ordinance. Existing zoning designations are provided in Figure 2-3 in Section 2, Project Description. The SUMC Project sponsors have proposed zoning changes to all of the Main SUMC Site (with the exception of the footprint of Durand Way) and all of the Hoover Pavilion Site. The SUMC Project sponsors also propose creation of a new zoning district that could be applied by the City to land uses specifically for hospitals, associated medical research, medical office, and support uses. The proposed boundaries of the new district are depicted in Figure 2-8 in Section 2, Project Description. The new zoning district would have its own name, such as "Hospital District," and would include development standards that accommodate hospital-related uses like the SUMC Project. Specifically, the SUMC Project sponsors have identified the following proposed standards for this new Hospital District.

- The new zoning district would have its own name, such as "Hospital District" or "Public Facilities/Hospital District."
- Permitted uses would include: private educational facilities; private universities; hospitals; outpatient medical facilities; medical research; medical offices; medical support services; retail services in conjunction with a permitted use; eating and drinking services in conjunction with a permitted use; and accessory facilities and activities customarily associated with or essential to permitted uses, and operated incidental to the principal use.
- As long as proposed uses are consistent with the zoning requirements, projects developed on these sites would be subject to design review and approval by the ARB, but would not require a conditional use permit.
- The maximum FAR for the area for the Main SUMC Site would be 1.5 to 1. FAR would be calculated based on the total contiguous area within this zone, rather than on a parcel by parcel basis. The maximum FAR for the Hoover Pavilion Site would be 0.5 to 1. Rooftop, basement, interstitial space, and interior areas used to enclose mechanical equipment would be excluded from floor area calculations.
- The maximum site coverage for the inboard Welch Road area would be 40 percent of the site area. The maximum site coverage for the Hoover Pavilion Site would remain at 30 percent. Parking facilities would not be counted in determining site coverage. Site coverage would be calculated based on the total contiguous area within this zone, rather than on a parcel by parcel basis.
- The maximum height on the Main SUMC Site would be 130 feet and the maximum height on the Hoover Pavilion Site would be 60 feet (for new structures). Helicopter pads on top of buildings would be excluded from height calculations.
- No yard adjoining a street would be less than 10 feet, measured from the curb to the base of the buildings and not including any awnings or other projections. This setback requirement would not apply to below-grade parking facilities or portions of buildings that bridge a street.

- No standards would be specified for the site area, including width or depth.
- Regulations governing accessory facilities and uses, and governing the application of site development regulations in specific instances would be established by Chapter 18.42.
- Parking requirements would be performance-based, as established during review of project design. Parking would be provided to meet projected needs, with consideration given to the potential for reduced parking demand due to the proximity of the PAITS.

Prior to annexation, the 0.75-acre area to be annexed would first need to be pre-zoned to be consistent with the rest of the Main SUMC Site.

Development Agreement. A Development Agreement would be approved as part of the SUMC Project if the terms of such an agreement could be mutually agreed upon. The terms proposed by the City to be included in the Development Agreement are as follows:

- Establishment of two new programs for the exclusive benefit of residents: a $3 million fund to assist qualified low-income residents and a $4 million fund to subsidize community health programs within Palo Alto.
- Construction spending and associated use taxes of $8.3 million and provisions to obtain a use tax direct payment permit that would generate approximately $26,000 annually.
- Purchase of Caltrain GO Passes (Transportation Demand Management [TDM] Measure) for all SUMC employees at an estimated annual cost of $1.3 million (currently, only Stanford University employees are entitled to this benefit).
- Expansion of the Marguerite service by purchasing additional shuttles in the amount of $2 million and by funding additional annual operating costs of $450,000.
- Funding a range of improvements to encourage use of transit and enhance bicycle and pedestrian connections between the hospitals and downtown: $2.25 million for bicycle and pedestrian connections are PAITS; $400,000 for right-of-way improvements along Quarry Road; and $700,000 for a pedestrian connection between the SUMC and the Stanford Shopping Center (the Stanford Barn area).
- Payment of housing in-lieu fees in the amount of $23.1 million, which is equivalent to what a commercial project would pay.

Agreement terms will be developed and negotiated following the release of the Draft EIR review process, and Council and the public will be provided additional opportunities to comment in detail on both the high level community benefit priorities as well as the specific deal terms. Supplemental Development Agreement Terms include:

- Healthcare:
  - Extend financial assistance subsidy to qualifying residents ($3 million) form 10 years to life of Development Agreement.
  - Extend community health programs payment ($4 million) from 10 years to life of Development Agreement.

- Continue appropriate hospital privileges for community practitioners.
- Continue SUMC's current community health/wellness/disease prevention programs.
- Fund co-located Emergency Operations Center (EOC) facility in new buildings within Palo Alto.
- Explore innovative healthcare initiative/partnership in area of broadband/fiber to the premises.

- Fiscal:
  - Ensure that the SUMC Project is at least cost neutral by guaranteeing revenue projections to offset expenditures, funding extra public safety Fulltime Equivalent's (FTE's), and fully funding mitigations.
  - Payment in lieu of property tax.
- Transportation: Explore re-defining TDM program (GO Pass) and re-directing funds toward expanded shuttle program and other Citywide infrastructure improvements.
- Bicycle and Pedestrian Linkages Benefit: These items are covered as SUMC Project mitigations and explained in more detail throughout the document.
- Housing Benefit: The Hospital District would include additional measures to address the jobs to housing impact, as identified in Section 3.13, Population and Housing.
- School Fees Benefit (PAUSD): Work with the School District and the City to minimize impacts to schools.
- Economic and Community Vitality: Contribute $30 million to help fund needed Citywide infrastructure such as a Public Safety Building, EOC, roadways, and expanded shuttle programs.

However, it is not anticipated that the Development Agreement would result in physical environmental impacts beyond those disclosed in this EIR for the SUMC Project. As such, the Development Agreement component of the SUMC Project is not discussed further in this document.

Other City Approvals. The SUMC Project sponsors have requested the following permits or approvals in addition to changes to the Comprehensive Plan and zoning ordinance.

- Annexation of the 0.75-acre site shown on Figure 2-5 in Section 2, Project Description.
- Architectural Review.
- The zoning ordinance proposed for this district by the City includes an Inclusionary Housing requirement. This component of the zoning ordinance is analyzed in the Village Concept Alternative, Section 5, Alternatives, of this document.
- Regulations in this district would include applicability, preservation, and exemptions for removal and replacement of Protected Trees. The Hospital District would create a procedure to permit the removal of approximately 48 Protected Trees while preserving approximately 23

Protected Trees that are considered both biologically and aesthetically significant. The existing Protected Trees that are considered both biologically and aesthetically significant are discussed in more detail in Section 3.9, Biological Resources, and Section 5, Alternatives. The Hospital District ordinance would include provisions for an applicable timeline (development vs. non-development) and for specific Protected Tree retention and preservation through development standards and regulations. Some Protected Trees that qualified for exemption to the regulations could be removed, providing that they are replaced per the City Tree Technical Manual (TTM) standards (TTM, Section 3.00). In addition, the Hospital District ordinance would require a minor amendment to the Tree Ordinance (PAMC 8.10) to recognize and cross-reference with the Hospital District ordinance.[11]

- The City of Palo Alto, in collaboration with Stanford University, SHC, and LPCH, prepared the SUMC Area Plan Update in 2007, as specified by the City's Comprehensive Plan Program L-46, which would be accepted by the City Council during the entitlement review of the SUMC Project.
- While the SUMC Project sponsors have requested that the SUMC Project components be deemed to be "permitted uses" under the proposed new Hospital District, it is possible that the City would only make these uses conditionally permitted. In that event, contrary to the proposal of the SUMC Project sponsors, the SUMC Project would also require one or more conditional use permits from the City.

Development Program

Hospital, Medical Office, and Medical Research Uses. As shown in Tables S-1 and S-2, the SUMC Sites contain approximately 2.37 million square feet of developed, occupiable space. To meet the needs and objectives provided above, the SUMC Project sponsors propose to demolish approximately 1.2 million square feet of the existing buildings and construct approximately 2.5 million square feet of replacement hospital, clinic/medical office, and medical research uses, resulting in a net increase of approximately 1.3 million square feet of hospital and clinic/medical office. The SUMC Project would result in an increase of about 824,000 square feet of SHC facilities within the Main SUMC Site, about 46,000 square feet of new clinic/medical office facilities at the Hoover Pavilion Site, about 442,000 square feet of LPCH facilities at the Main SUMC Site, and no increase in SoM facilities at the Main SUMC Site.

[11] Dave Dockter, Environmental Planner, City of Palo Alto Department of Planning and Community Environment, "SUMC Environmental Impact Report Strategy: How the City will approach evaluation of the Tree Resources in the SUMC Project Area," memorandum, July 28, 2009.

Table S-1
Proposed Changes in Floor Area within SUMC Sites (square feet)

Category of Use	Existing Floor Area	Proposed Construction	Proposed Demolition	Net Change (Construction Minus Demolition)	Post Construction Floor Area (Existing plus Net Change)
SHC Facilities at Main SUMC Site					
1959 Hospital Building complex (East, West, Core, Boswell)	441,201	0	(441,201)	(441,201)	0
1973 Core Expansion	223,850	0	(223,850)	(223,850)	0
1101 Welch Road Medical Offices[a]	40,100	0	(40,100)	(40,100)	0
Entry	77	0	(77)	(77)	0
Other portions to remain in place, some of which would be renovated (see Table 2-1)[b]	741,887	0	0	0	741,887
New SHC Hospital	0	1,100,000	0	1,100,000	1,100,000
New SHC Clinic/Medical Office	0	429,000	0	429,000	429,000
Subtotal	*1,447,115*	*1,529,000*	*(705,228)*	*823,849*	*2,270,887*
Facilities at Hoover Pavilion Site					
Hoover Pavilion – misc. (shops and storage)	13,831	0	(13,831)	(13,831)	0
Hoover Pavilion – main building	84,230	0	0	0	84,230
Arboretum Children's Center	7,375	0	0	0	7,375
New medical office for community practitioners	0	60,000	0	60,000	60,000
Subtotal	*105,436*	*60,000*	*(13,831)*	*46,169*	*151,605*
LPCH Facilities at Main SUMC Site					
Existing LPCH Hospital	274,700	0	0	0	274,700
New LPCH Hospital	0	471,300	0	471,300	471,300
701 and 703 Welch Road Medical Offices	79,800	0	(79,800)	(79,800)	0
New LPCH Clinic/Medical Office	0	50,000	0	50,000	50,000
Subtotal	*354,500*	*521,300*	*(79,800)*	*441,500*	*796,000*
SoM Facilities at Main SUMC Site					
1959 Hospital Building complex (Grant, Alway, Lane, Edwards)	414,977	0	(414,977)	(414,977)	0
Other portions not to be affected (Falk Building)	52,226	0	0	0	52,226
FIM 1, 2, 3	0	414,977	0	414,977	414,977
Subtotal	*467,203*	*414,977*	*(414,977)*	*0*	*467,203*
TOTAL FLOOR AREA in SUMC SITES	**2,374,254**	**2,525,277**	**(1,213,836)**	**1,311,441**	**3,685,695**

Source: SUMC, 2010.

Notes:

a. SUMC plans to construct an additional 14,200 square feet of medical office space at 801 Welch Road. As indicated in the Application, that project is not part of the currently proposed SUMC Project, but is expected to be pursued in the future. As such, it is not included in the total floor area in this table.

b. Includes Hospital Modernization Project, Blake Wilbur Clinic, Advanced Medicine Center, and 801 Welch Road. These structures would not be demolished under the SUMC Project.

Table S-2
Proposed Changes in Floor Area Per Land Use[a] Within SUMC Sites (square feet)[b]

Building	Existing Floor Area	Net Change	Post Construction Floor Area
Hospital Inpatient Use – Main SUMC Site			
SHC portions of 1959 Hospital Buildings	133,025	(133,025)	0
1973 Core Expansion	223,850	(223,850)	0
Existing LPCH	274,700	0	274,700
New SHC Hospital (456 beds)	0	1,100,000	1,100,000
New LPCH Hospital	0	471,300	471,300
Entry	77	(77)	0
Other hospital uses not to be affected[c]	431,280	0	431,280
Subtotal	*1,062,932*	*1,214,348*	*2,277,280*
Clinic/Medical Office Use – Main SUMC Site			
SHC portions of 1959 Hospital Buildings	308,176	(308,176)	0
1101 Welch	40,100	(40,100)	0
701 and 703 Welch	79,800	(79,800)	0
New SHC Clinic/Medical Office	0	429,000	429,000
New LPCH Clinic/Medical Office	0	50,000	50,000
Clinic uses not to be affected[d]	310,607	0	310,607
Subtotal	*738,683*	*50,924*	*789,607*
Clinic/Medical Office – Hoover Pavilion Site			
Hoover Pavilion – main building	84,230	0	84,230
New clinic/medical office	0	60,000	60,000
Subtotal	*84,230*	*60,000*	*144,230*
Other – Hoover Pavilion Site			
Misc. shops and storage	*13,831*	*(13,831)*	*0*
Arboretum Children's Center	*7,375*	*0*	*7,375*
Research/Laboratory – Main SUMC Site			
1959 Hospital Building (Lane, Grant, Alway, Edwards)	414,977	(414,977)	0
Falk Building	52,226	0	52,226
FIM 1, 2, and 3	0	414,977	414,977
Subtotal	*467,203*	*0*	*467,203*
TOTAL FLOOR AREA in SUMC SITES	**2,374,254**	**1,311,411**	**3,685,695**
Total Clinic/Medical Office in SUMC Sites (Main SUMC Site + Hoover Pavilion Site)	***822,913***	***110,924***	***933,837***

Source: SUMC, 2010.

Notes:

a. Identification of uses is approximate.

b. Rooftop, basement, interstitial space, and interior areas used to enclose mechanical equipment shall be excluded from floor area calculations.

c. Includes SHC Hospital Modernization Project, which would be renovated.

d. Includes Blake Wilbur Clinic, Advanced Medicine Center, 801 Welch Road.

Categorized according to use, the approximately 1.3 million square feet of proposed additional space would include about 1.2 million square feet of hospital space and about 100,000 square feet of clinic/medical office space. There would be no increase in research space.

Right-sizing. Right-sizing refers to increasing floor area per inpatient bed or service without substantially increasing the number of patients or employees. Right-sizing is a trend that many hospitals undergo to conform to modern healthcare standards. As described under the discussion of existing conditions, the SHC and LPCH Hospitals suffer from an outmoded ratio of semi-private patient rooms to single-bed patient rooms and treatment space, and an inadequately sized Emergency Department. Replacing these areas would increase floor area, but would not involve an increase in operations. Approximately 34 percent of the building program would be attributable to right-sizing.

Parking. To accommodate the increase in floor area, the SUMC Project sponsors propose to replace the occupied spaces that are being demolished, build additional spaces in the same amount needed to meet new parking demand associated with the SUMC Project, and maintain a 10 percent vacancy rate to ensure that drivers are able to locate parking spaces without excessive recirculation through the parking area. As shown in Table S-3, there are currently 871 occupied spaces in the existing parking facilities that would be demolished, including Parking Structure 3 and Falk Lot 5 on the Main SUMC Site and a portion of Lot 1A on the Hoover Pavilion Site. The expansion components of the SUMC Project would create a demand for 2,053 additional new spaces in 2025. Thus, the total new and replacement parking provision would be 2,985 spaces, which would be allocated as 2,053 for SUMC expansion and 932 as replacement parking for existing spaces demolished during project construction. The replacement parking (932 spaces) is calculated in 871 spaces removed plus a 10 percent vacancy factor. The calculated vacancy factor is slightly less than 10 percent because some of the new demand would be met through existing vacant.[12,13]

Site Plan

Figure 2-5 in Section 2, Project Description, shows the existing layout plan at the SUMC Sites, including both the Main SUMC Site and the Hoover Pavilion Site. This figure also shows the structures to be demolished. Figures 2-12 and 2-13 in Section 2, Project Description shows the post-construction site plan and identifies the new structures, which would hold replacement and expansion facilities of the SHC, LPCH, and SoM. A further discussion of the proposed structures is provided under the succeeding subheadings.

12 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 3, Table 3-5.

13 AECOM Transportation, *Stanford University Medical Center Environmental Impact Report, Transportation Impact Analysis*, Appendix C, March 2010.

Table S-3
Proposed Changes in Parking Supply at the SUMC Sites (number of spaces)

Parking Facility	Replacement Parking Demand	Proposed Construction	Net Change
Main SUMC Site			
Existing Parking Structure 3	(671)	0	(671)
Existing Falk Lot 5	(115)	0	(115)
New SHC Structure (Underground)	0	970	970
New LPCH Structure (Underground)	0	430	430
New Clinics Structure (Underground)	0	500	500
Subtotal	*(786)*	*1,900*	*1,114*
Hoover Pavilion Site			
Existing Portion of Hoover Lots	(85)	0	(85)
New Hoover Structure	0	1,085	1,085
Subtotal	*(85)*	*1,085*	*1,000*
Combined Replacement Subtotal	**(871)**	**2.985**	**2,114**
Vacancy Factor (10%)[a]	**(61)**	**0**	**(61)**
TOTAL SUMC SITES	**(932)**	**2,985**	**2,053**

Source: SUMC, 2010.

Note:

a. A 10 percent supply buffer would ensure that drivers are able to locate parking spaces without excessive re-circling. Calculated vacancy factor is less than 10% because some new demand will be met through existing vacant spaces.

In terms of site usage, the total post-construction impervious area within the SUMC Sites would be about 44 acres or about 63 percent of the total site area. As such, about 18 acres or 26 percent of the total site area would consist of pervious (landscaped) area with 8 acres of planted roof.[14] Impervious areas within the SUMC Sites would include roadways, building footprints, parking lots, and paved pathways.

Stanford Hospital and Clinics. As shown in Figures 2-12a and 2-12b in Section 2, Project Description, the SUMC Project would involve demolition, construction, renovation, and reuse of SHC's Hospital and clinic/medical offices. Also, the SUMC Project would build a new, additional heliport and associated helicopter parking spaces. The existing heliport may remain in order to enable landings associated with organ transport to be closer to LPCH when needed for LPCH surgeries. This would not increase the total number of future helicopter flights nor increase impacts. The SUMC Project would also expand and relocate the SHC Emergency Department. A description of the new facilities is provided below.

[14] Total pervious versus impervious area is extracted from the SUMC Project application and does not exactly correspond to the total 66-acre combined area of both SUMC Sites because sources for the acreages differ. However, the sum of the pervious versus impervious area is 70 acres, which is approximate to the 66-acre combined area of both SUMC Sites.

SHC Hospital. As shown in Figures 2-12a and 2-12b in Section 2, Project Description, 133,025 square feet at the East, West, and Core portions of the 1959 Hospital Building complex and 223,850 square feet at the Core Expansion (containing 213 beds) would be demolished. To replace the demolished hospital space, a new 1.1-million-square-foot SHC Hospital building would be constructed where Parking Structure 3 and the clinic/medical office building at 1101 Welch Road are currently located. The main core of the building would be 40 feet tall and the hospital would also have five towers, or modules that would be up to 130 feet tall and a sixth module that would be up to 64 feet tall (see Figure 2-11 in Section 2, Project Description). The new hospital would house 456 beds and would replace shared patient rooms with single patient rooms. Operating and treatment suites, imaging and diagnostic services, a new ED, and associated nursing and support space would be housed in the new hospital building.

The Hospital Modernization Project (HMP) building (see Figure 2-5 in Section 2, Project Description), which was added in 1989, would be renovated and reused to house diagnostic and treatment space and other supporting functions such as materials management, clinical laboratories, and physician and administrative offices. Nursing units D, E, and F, which currently house 243 hospital beds, would be renovated. The transition from shared patient rooms to single patient rooms would reduce the bed capacity of these buildings by 99 hospital beds. As such, this facility would have 144 beds after construction, and the entire SHC portion of the campus would have 600 beds.

Clinics/Medical Offices. As shown in Figures 2-13a and 2-13 in Section 2, Project Description, 308,176 square feet of clinic and medical offices in the SHC portion of the 1959 Hospital Building complex and 40,100 square feet at 1101 Welch Road would be demolished at the Main SUMC Site. To replace and expand the demolished clinic space, four smaller clinic/medical office buildings totaling 429,000 square feet would be constructed where the 1959 Hospital Building complex is currently located. These buildings would range in height from 64 to 112 feet tall with a center platform at 40 feet.

In addition, as shown in Figures 2-13a and 2-13b in Section 2, Project Description, about 60,000 square feet of medical/clinic office space would be constructed in a new building at the Hoover Pavilion Site and the existing Hoover Pavilion building would be renovated, with portions converted to medical office uses. Health care providers who currently lease space at 1101 Welch Road would be offered long-term leases in the Hoover Pavilion. The Hoover Pavilion would also continue to be used for SHC clinic-related uses, as it is used currently. The new clinic/medical office structure would be 60 feet tall (see Figure 2-11 in Section 2, Project Description). About 13,831 square feet of shops and storage space at the Hoover Pavilion Site would be demolished to accommodate the construction.

Overall, the SUMC Project would result in a net increase of 50,924 square feet of clinic/medical office space at the Main SUMC Site and 60,000 square feet of clinic/medical office space at the Hoover Pavilion site, or a total net increase of 110,924 square feet of SHC and community practitioner clinic/medical office space at the SUMC Sites (see Table S-2).

Relocated Emergency Department. As shown in Figure 2-5 in Section 2, Project Description, the existing ED that serves both hospitals is at the south side of the Core Expansion, off Quarry Road. As shown in Figure 2-10 in Section 2, Project Description, the ED would be relocated to the west side of the proposed hospital building off Welch Road. Also, the ED would be expanded from 11,700 square feet to 47,892 square feet,[15] and the number of treatment spaces would be increased from 38 to 51.

New Heliport. As shown in Figure 2-5 in Section 2, Project Description, the existing heliport that serves both hospitals is at the roof of the HMP. As shown in Figure 2-10 in Section 2, a new, additional heliport would be located about 700 feet to the northwest, at a height of up to 130 feet on the roof of the new SHC hospital building. The takeoff/landing pad at the heliport would be designed to accommodate one helicopter at a time. The size of the helicopters regularly using the heliport is anticipated to be the same as under current conditions. However, in order to meet new requirements to accommodate larger helicopters in the event of a natural disaster or other large-scale emergency, the new heliport would be constructed to accommodate a helicopter size of 22,000 pounds deadweight (as compared to 12,000 pounds for the helicopters regularly using the heliport). The existing heliport would continue to be used on occasion, primarily for landings associated with organ transport to LPCH.

Lucile Packard Children's Hospital. As shown in Figures 2-14a and 2-14b in Section 2, Project Description, the SUMC Project would involve reuse, renovation and expansion of LPCH hospital space, and replacement of clinic/medical office space. A description of the new facilities is provided below.

LPCH Expanded Hospital Space. Two structures on the eastern edge of the Main SUMC Site, 701 Welch and 703 Welch, would be demolished to accommodate expanded hospital space for the LPCH. These two structures, totaling 79,800 square feet, currently house approximately 22,900 square feet of non-SUMC community health providers. The hospitals have leased approximately 40,000 square feet of existing medical office space on Middlefield Road in Menlo Park, and the majority of that space is dedicated to meeting the needs of the community health care providers who currently occupy the leased space in 701 and 703 Welch Road, most of whom (dentists and others) do not require hospital proximity.

In place of the demolished structures, a new 471,300-square-foot LPCH Hospital expansion would be constructed. The LPCH Hospital expansion would house 104 new inpatient beds, new surgical operating suites, new diagnostic and treatment suites, and associated nursing and support space. The addition would be approximately 85 feet tall (See Figure 2-11 in Section 2, Project Description).

In addition to the hospital expansion, two floors in the existing F Nursing Unit of the HMP building as well as the main LPCH Hospital facility would be renovated and reused. The portions of the HMP building to be renovated house the F Nursing Unit, including the Obstetrics program. The main LPCH

[15] The 36,192-square-foot increase in ED size includes 25,000 square feet of "right-sizing" or decompression space, which refers to expanded floor area to serve as treatment space. The right-sizing or decompression trend is typically seen in modernizing hospitals as modern treatment standards require increased floor area per bed or treatment space, compared to older hospital facilities. As such, only 11,192 square feet of the ED expansion would be associated with an increased level of operations.

hospital facility would continue to house the 257 existing inpatient beds as well as diagnostic, treatment, clinical, and support services

LPCH Clinics/Medical Offices. Clinic and support services would be integrated with the 85-foot-tall addition to the LPCH hospital facilities. The new clinic facilities would add about 50,000 square feet of new outpatient treatment area to the proposed hospital expansion, which would be in addition to the 471,300 square-foot expansion of the new LPCH Hospital. In total, the LPCH expansion would result in a net change of 441,500 additional square feet at the site (including the net loss of 79,800 square feet at 701 and 703 Welch Road).

School of Medicine. As shown in Figures 2-15a and 2-15b in Section 2, Project Description, the SoM portion of the SUMC Project would involve the demolition and replacement of existing research facilities to address seismic requirements and to bring the facilities up to current industry standards. In place of the four existing research buildings at the southwest corner of the Main SUMC Site—Edwards, Lane, Alway, and Grant—three separate, new Foundations in Medicine (FIM) buildings would be constructed along the southwest edge of the Main SUMC Site. The largest of the three buildings, FIM 1, would be 185,000 square feet. FIM 2 would be 120,000 square feet and FIM 3 would 109,977 square feet. All FIMs would be a maximum height of 66 feet tall. A total of approximately 415,000 square feet would be housed in the three FIM buildings, and no changes in floor area would result from the facility replacement.

As no net change in floor area would result from the SoM facility replacement, no additional parking facilities to support the FIM buildings are proposed.

Site Access/Circulation

The SUMC Project would involve alterations to the existing site access pattern at both the Main SUMC Site and the Hoover Pavilion Site; the proposed site access plan is depicted in Figure 2-16 in Section 2, Project Description. Pasteur Drive, a loop road that begins and ends at the site's northern boundary, would continue to function as an access road for patient/visitor parking, providing access to SHC drop-off and the new SHC parking garage. New access roads/driveways would be constructed and are listed below.

- Welch Road would be widened from two to three lanes to provide a dedicated left-turn lane in both directions, and it would continue to serve vehicle circulation within the SUMC, connecting Quarry Road to Pasteur Drive and to Campus Drive.
- Durand Way, a four-lane connector road, would be constructed between Sand Hill Road and Welch Road to provide additional Medical Center access from Sand Hill Road (at the current signal). No demolition of existing structures would be necessary to construct Durand Way. This connector road would extend into the Advanced Medicine Center.
- A new driveway would be constructed, with ingress and egress from Welch Road; this driveway would provide ambulance access to the new SHC hospital's ED and service access to the technology dock.

- A second new driveway would be provided for public access to the Emergency Department, along with a small area for patient drop-off.
- Two new driveways would be installed to the east and to the south of the proposed new LPCH hospital addition to provide drop off access and access to the new LPCH loading area.
- The existing Quarry Road extension to Roth Way would be improved, and a new loop driveway would be constructed near the new SHC clinic buildings to provide enhanced access to the proposed SHC clinic buildings. Ingress/egress into the SHC underground Clinic garage would be off the Quarry Road extension.
- A new drop-off loop, as well as ingress and egress to the new SHC parking structure would be provided from Pasteur Drive.
- New access driveways would be constructed at the Hoover Pavilion Site.

Site Activity

Hospital Beds. The SHC currently operates with 456 beds; with implementation of the SUMC Project, the SHC would add 144 beds for a total of 600 hospital beds. The LPCH currently maintains 257 beds; with implementation of the SUMC Project, the LPCH would add 104 beds for a total of 361 hospital beds. In total, both hospitals currently operate with 713 beds, and with implementation of the SUMC Project both hospitals would add 248 beds for a total of 961 hospital beds.

Patient Visits. Both hospitals would be constructed by 2015, although full occupancy of the hospitals would not occur until 2025. Annual SHC outpatient visits would increase from 403,885 to 470,923 at 2015 (an increase of 67,038) and to 572,949 at 2025 (a further increase of 102,026). Annual LPCH outpatient visits would increase from 107,363 to 138,893 in 2015 (an increase of 31,530) and to 153,349 at 2025 (an additional increase of 14,456). In total, the SUMC Project would increase annual outpatient visits by 215,050 upon full occupancy at 2025. [16]

The average daily census of SHC would increase from 362 to 413 at 2015 (an increase of 51 occupied beds) and to 465 at 2025 (an additional increase of 52 occupied beds). The average daily census for LPCH would increase from 194 to 236 at 2015 (an increase of 42 occupied beds) and to 301 at 2025 (an additional increase of 65 occupied beds). In total, the SUMC Project would increase the daily average number of occupied beds by 210 upon full occupancy in 2025.[17]

Employment. Full buildout and occupancy of the SUMC Project would result in an increase of 2,242 new full-time equivalent employees,[18] or an approximately 23 percent increase over 2007 employment. In 2015,

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16 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5.

17 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5.

18 Adjusted for part-time employment.

the SUMC Project would add 1,929 net new employees, or an approximately 20 percent increase over 2007 employment. Upon full buildout, SUMC would include approximately 12,123 employees.[19]

Heliport Activity. SUMC anticipates that heliport operations would increase by 10 percent upon 2015 and by 28 percent upon full occupancy of the two hospitals by 2025. That is, from the existing 2,120 annual helicopter trips (an average of six daily trips), the SUMC Project would increase annual trips to 2,332 (an average of six daily trips) by 2015 and to 2,714 (an average of seven daily trips) by 2025. These additional annual trips equal less than one additional trip per day at 2015 and about one additional trip per day at 2025. As is currently the case, trips would be permitted during both day and nighttime hours. About half of the trips (about one trip every other day) would be associated with refueling at the Palo Alto Municipal Airport; given the amount of additional trips, there would be no noticeable increase in the number of trips associated with the Palo Alto Municipal Airport. About five to six trips per year would be associated with maintenance trips to Moffett Field. All of the refueling and maintenance trips are included in the total of 2,332 trips projected for 2015 and 2,714 trips projected for 2025.

Emergency Department Activity. As previously stated, the ED would be expanded from 11,700 square feet to 47,892 square feet,[20] and the number of treatment spaces would be increased from 38 to 51. Based on this increase in size and treatment spaces, SUMC anticipates annual ED visits to increase from the current 42,522 (116 per day) to 61,200 (168 per day) by 2015 and to 72,675 (199 per day) by full occupancy of the hospitals in 2025. The proportion of ambulance visits is expected to remain fairly constant in the future (i.e., 19.6 percent of ED visits). Therefore, the SUMC estimates ambulance trips would increase from the current total of 8,331 trips (23 per day) to 11,995 trips (33 per day) by 2015 and 14,244 trips (39 per day) by full occupancy of the hospitals in 2025. The ED relocation would result in the continuation of ambulance trips along Quarry Road, Welch Road, and Sand Hill Road south of Pasteur Drive and rerouted. Additional ambulance trips would occur along Sand Hill Road between El Camino Real and Pasteur Drive.

Loading Activity. As shown in Figure 2-5 in Section 2, a single existing loading area, off Quarry Road, serves SHC and LPCH at the Main SUMC Site. As shown in Figure 2-10, the existing loading area would be maintained and two more would be added. A new loading area would serve the LPCH (truck access to the loading areas is depicted in Figure 2-16). A third technology dock would be added that would have access off Welch Road when major equipment would be delivered and, therefore, would have minimal truck trips. The technology dock would experience about two deliveries per month.

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19 Keyser Marston Associates, Inc., Final Proposed Stanford University Medical Center Expansion Housing Needs Analysis, prepared for the City of Palo Alto, September 2009.

20 The 36,192-square-foot increase in ED size includes 25,000 square feet of "right-sizing" or decompression space, which refers to expanded floor area to serve as treatment space. The right-sizing or decompression trend is typically seen in modernizing hospitals as modern treatment standards require increased floor area per bed or treatment space, compared to older hospital facilities. As such, only 5,600 square feet of the ED expansion would be associated with an increased level of operations.

Because the demand for deliveries is closely related to hospital inpatients,[21] there would be an incremental increase in loading trips proportional to the projected increase in inpatient discharges. Approximately 50 percent of the delivery demand would be met with existing trucks that would be filled to a greater capacity.[22] The resulting truck trips to the loading areas are shown in Table 2-10, which indicates an increase of five daily trips by 2015 (two at the LPCH loading dock and three at the SHC loading dock) and an additional nine daily trips between 2015 and 2025 (three at the LPCH loading dock and six at the SHC loading dock). The percentage of trips per vehicle type would remain constant to those identified in Table 2-3 for the existing conditions.

S.5 IMPACTS AND MITIGATION MEASURES

Table S-4 presents a summary of the impacts of the SUMC Project, proposed mitigation measures, and each impact's level of significance after mitigation. The environmental impacts are identified and classified as "Significant," "Less Than Significant," or "No Impact." According to CEQA Guidelines Section 15382, a significant impact is ". . . a substantial or potentially substantial adverse change in any of the physical conditions within the area affected by the project . . ." CEQA Guidelines Section 15126.4 states that an EIR ". . . shall describe feasible mitigation measures which could minimize significant adverse impacts. . ." In this EIR, mitigation measures are identified for all of the impacts labeled "Significant." The inclusion of these measures in Table S-4 provides a comprehensive listing in one place of all the impacts and mitigation measures recommended for the SUMC Project.

The City distributed a Notice of Preparation (NOP) on August 22, 2007, announcing its intent to prepare and distribute an EIR analyzing the impacts of the SUMC Project. Appendix A of this document contains the NOP and the written comments that were received are listed and attached to a separate Scoping Report,[23] which is available at the City's Planning Department and Community upon request. The NOP identified two separate projects, including the SUMC Project and the Simon-Properties Stanford Shopping Center Expansion. However, this application was withdrawn in April 2009. Given Stanford University's statement that it intends to focus its development efforts on the SUMC Project,[24] and due to the current economic downturn and changing retail trends, the scope of any future development at the Stanford Shopping Center is too speculative to analyze at this point. As such, this EIR addresses only the SUMC Project. (See Section 3.1, Introduction to the Environmental Analysis, for a discussion of the assumptions in defining cumulative scenario.)

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21 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5.

22 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5.

23 Trixie Martelino, Project Manager, PBS&J, Scoping Report memorandum prepared for the City of Palo Alto, December 4, 2007. Available upon request from the City of Palo Alto Planning and Community Environment Department, 250 Hamilton Avenue, Palo Alto, CA 94301.

24 Barbara Schussman, Bingham McCutchen LLP, Letter to Cara Silver, Senior Assistant City Attorney, April 16, 2009.

Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
3.2 Land Use			
LU-1. Conflicts with Adopted Land Use Plans and Policies. Without mitigation measures to ensure consistency with the Comprehensive Plan's policies adopted for the purpose of avoiding or mitigating an environmental effect, the SUMC Project could conflict with Comprehensive Plan policies that avoid or reduce impacts related to visual quality, cultural resources, pedestrian circulation, urban forest resources, groundwater and runoff pollution, air quality degradation, and noise incompatibility.	S	MITIGATION MEASURES. The mitigation measures identified below would ensure that the SUMC Project would have no conflicts with Comprehensive Plan policies adopted for the purposes of avoiding or mitigating environmental impacts. These measures include Mitigation Measure VQ-2.1, which requires compliance with the City's Architectural Review process and recommendations; CR-1.2 through 1.4, which involves measures to minimize the loss of the historic Edward Durell Stone Building complex; CR-1.1 and CR-1.5, which involve measures to minimize vibration impacts on the Hoover Pavilion; TR-6.1, which requires improvements for bicycle and pedestrian safety and access at intersections affected by SUMC Project traffic; BR-4.1 through BR-4.5, which require the preparation of a Tree Preservation Report, a solar access study, a Tree Relocation Feasibility Plan, a Tree Preservation Bond/Security Guarantee, and minor site modifications to the current site plans; HW-3.1, which requires a work plan to protect groundwater from contamination; AQ-1.1 through AQ-1.2, which would control construction dust and reduce diesel emissions; NO-4.1, which requires noise shielding or enclosure of equipment; and NO-1.1, which controls construction noise	LTS
LU-2. Conflicts with Established Residential, Recreational, Educational, Religious, or Scientific Uses in the Area. The SUMC Project would not conflict with residential, recreational, educational, religious or scientific uses.	NI	None required.	N/A
LU-3. Physical Division of an Established Community. The SUMC Project would not physically divide an established community.	NI	None required.	N/A

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
LU-4. Farmland Conversion. The SUMC Project would have no impact on conversion of farmland to non-agricultural uses.	NI	None required.	N/A
LU-5. Adverse Changes to Overall Existing or Planned Land Uses in the Area. Because the SUMC Project would intensify the planned uses within the SUMC Sites, the SUMC Project would have a significant impact pertaining to on-site character and views.	S	MITIGATION MEASURE. Mitigation Measure VQ-2.1, requires and ensures compliance with Architectural Review Board (ARB) recommendations for final design and would reduce impacts from increased intensity under the SUMC Project. Based on the SUMC Project design guidelines, the Architectural Review would consider, among other factors, whether the SUMC Project has a coherent composition and whether its bulk and mass are harmonious with surrounding development. Thus, implementation of Mitigation Measure VQ-2.1 would reduce the significant impacts on overall surroundings to a less-than-significant level.	LTS
LU-6. Cumulative Impacts on Changes to Overall Existing or Planned Land Uses in the Area. The SUMC Project, in combination with other reasonably foreseeable probable future development in the area, would have a less-than-significant cumulative impact on overall existing or planned land uses in the vicinity of the SUMC Sites.	LTS	None required.	N/A
3.3 Visual Quality			
VQ-1. Temporary Degradation of Visual Character During Construction. The SUMC Project would substantially degrade the existing visual character and quality of the SUMC Sites during construction. (S)	S	MITIGATION MEASURE. Mitigation Measure VQ-1.1, below, would reduce visual impacts during construction to less than significant. (LTS) *VQ-1.1* *Implement Construction Visual Improvements Plan.* The SUMC Project sponsors shall develop and implement a Construction Visual Improvements Plan that would make visual improvements to construction zones within a given construction phase and between phases if the zone is not scheduled for construction	

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		activity or would remain unused for a period greater than six months. Construction zones subject to this mitigation measure shall be defined by the Planning Director, and shall consider the size of the area, the nature and timing of the construction activity, and the proximity or visibility of the area to public vantage points or residential uses. The Construction Visual Improvements Plan shall be implemented by the project contractor(s) and must be approved by the Planning Director. The intent of the plan is to aesthetically improve portions of the project site that would remain unimproved for an extended period and screen the construction zone from view by passersby along the public streets and sidewalks. Possible improvements in the plan include, but are not limited to, the following: a. The SUMC Project sponsors shall conceal staging areas with fencing material to be approved by the Planning Director prior to commencement of use of the staging area for construction equipment and vehicles. b. The SUMC Project sponsors shall frequently remove construction debris and refuse from the SUMC Sites. c. The SUMC Project sponsors shall install all landscaping as early as feasible to decrease visual impacts of construction. Existing landscaping within the SUMC Sites that would not be removed by the construction shall be maintained.	
VQ-2. Permanent Degradation of Visual Character Post Construction. The SUMC Project would have a significant impact pertaining to degradation of the existing visual character or quality of the SUMC Sites and their surroundings.	S	MITIGATION MEASURE. Mitigation Measure VQ-2.1, below, requires and ensures compliance with ARB recommendations for final design. Such compliance would ensure that impacts on on-site visual character and quality would be less than significant because the ARB's recommendations, through the Architectural Review process, would address massing, layout, landscaping, and architectural design impacts from the SUMC Project, as described further below.	

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		VQ-2.1 Adhere to City's Architectural Review Process and Recommendations. The SUMC Project sponsors shall submit final building and site plans to the ARB prior to issuance of any development permits. Architectural Review shall assess the appropriateness of proposed demolitions, proposed building heights and massing, siting of buildings and structures, architecture and façade treatments, landscaping, circulation plans, and parking. The ARB may require alterations to any of the above project features, or the ARB may suggest new features, such as new landscaping or public art, to improve the proposed SUMC Project design. Any recommendations made by the ARB with respect to the design of the SUMC Project shall be implemented by the SUMC Project sponsors.	
VQ-3. Alteration of Public Viewsheds, View Corridors, or Scenic Resources. The SUMC Project would result in significant impacts on views.	S	MITIGATION MEASURE. Mitigation Measure VQ-2.1, above, requires and ensures compliance with ARB recommendations for final design and would reduce impacts on views from the proposed buildings under the SUMC Project. The Architectural Review of the SUMC Project would consider, among other factors, whether the SUMC Project has a coherent composition and that its bulk and mass are harmonious with surrounding development. The ARB's recommendations regarding these factors will be forwarded to the City Council for consideration. The City Council would then review the recommendations and make findings, as appropriate, that natural features are appropriately preserved and integrated with the SUMC Project; the design promotes harmonious transitions in scale and character in areas between different designated land uses; and the planning and siting of the various functions and buildings on the site create an internal sense of order and provide a desirable environment for occupants, visitors, and the general community. Implementation of Mitigation Measure VQ-2.1 regarding the Architectural Review process would ensure that impacts on views would be less than significant.	LTS

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
VQ-4. Terrain Modifications. The SUMC Project would not require substantial terrain modifications that would degrade the visual character of the SUMC Sites.	NI	None required.	N/A
VQ-5. New Sources of Light and Glare. The SUMC Project could increase light and glare nuisance from exterior lighting, resulting in a significant impact.	S	MITIGATION MEASURE. Mitigation Measure VQ-2.1, above, requires compliance with ARB recommendations for final design and would reduce light and glare impacts from the proposed buildings under the SUMC Project. The Architectural Review of the SUMC Project would consider, among other factors, whether the SUMC Project incorporates quality materials, harmonious colors, appropriate ancillary features, a cohesive design with a coherent composition, and an appropriate lighting plan. The ARB's recommendations regarding these factors will be forwarded to the City Council for consideration. The City Council would then review the recommendations and make findings, as appropriate, that the design is compatible with the immediate environment of the SUMC Sites; is appropriate to the function of the SUMC Project; promotes harmonious transitions in character in areas between different designated land uses; and is compatible with approved improvements both on and off the site. This Architectural Review process would ensure that exterior treatment would not emit substantial glare and that exterior lighting impacts would be less than significant.	LTS
VQ-6. Shadowing of Public Open Space. The SUMC Project would not substantially shadow public open space (other than public streets and adjacent sidewalks) between 9:00 a.m. and 3:00 p.m. from September 21 to March 21.	LTS	None required.	N/A
VQ-7. Cumulative Impacts on Visual Character. The SUMC Project, in combination with other reasonably foreseeable probable future development in the area, would have a less-than-significant cumulative impact on visual character in the vicinity of the SUMC Sites.	LTS	None required.	N/A

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SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
VQ-8. Cumulative Impacts on Sensitive Views. The SUMC Project, in combination with other reasonably foreseeable future development in the area, would have less-than-significant cumulative impacts on sensitive views.	LTS	None required.	N/A
VQ-9. Cumulative Light and Glare. The SUMC Project, in combination with other reasonably foreseeable probable future development in the area, would be subject to Architectural Review and Municipal Code, and County requirements pertaining to light and glare. Impacts would therefore be less than significant.	LTS	None required.	N/A
VQ-10. Cumulative Shadows. Shadows from the SUMC Project are not expected to combine with shadows from other nearby reasonably foreseeable probable future development. There would be no cumulative impacts.	NI	None required.	N/A
3.4 Transportation			
TR-1. Construction Impacts. Construction activity associated with the SUMC Project could result in significant traffic impacts.	S	MITIGATION MEASURES. With implementation of the following mitigation measures, the significant construction related traffic impacts would be reduced to less-than-significant levels. *TR-1.1* *Provide Off-Street Parking for Construction Related Vehicles.* The SUMC Project sponsors shall be required to provide adequate off-street parking for all construction-related vehicles throughout the construction period. If adequate parking cannot be provided on the construction sites, a remote parking area shall be designated, and a shuttle bus shall be operated to transfer construction workers to the job site.	LTS

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation		Mitigation Measures	Impact Significance With Mitigation
		TR-1.2	*Maintain Pedestrian Access*. The SUMC Project sponsors shall be prohibited from substantially limiting pedestrian access while constructing the SUMC Project, without prior approval from the City of Palo Alto Department of Public Works. Such approval shall require submittal and approval of specific construction management plans to mitigate the specific impacts to a less-than-significant levels. Pedestrian access-limiting actions would include, but not be limited to, sidewalk closures, bridge closures, crosswalk closures or pedestrian re-routing at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions which may affect the mobility or safety of pedestrians during the construction period. If sidewalks are maintained along the construction site frontage, covered walkways shall be provided.	
		TR-1.3	*Maintain Bicycle Access*. The SUMC Project sponsors shall be prohibited from limiting bicycle access while constructing the SUMC Project without prior approval from the City of Palo Alto Department of Public Works. Such approval shall require submittal and approval of specific construction management plans that warn cyclists prior to reaching the impacted bicycle lanes and provide alternative routing around the construction sites to mitigate the specific impacts to a less-than-significant level. Bicycle access-limiting actions would include, but not be limited to, bicycle lane closures or narrowing, closing or narrowing of streets that are designated bicycle routes, bridge closures, the placement of construction-related materials within designated bicycle lanes or along bicycle routes, and other actions which may affect the mobility or safety of bicyclists during the construction period.	

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		TR-1.4 *Restrict Construction Hours*. The SUMC Project sponsors shall be required to prohibit or limit the number of construction material deliveries from 7:00 a.m. to 9:00 a.m., and from 4pm to 6pm on weekdays. The SUMC Project sponsors shall be required to prohibit or limit the number of construction employees from arriving or departing the site from the hours of 4:30 p.m. to 6:00 p.m.	
		TR-1.5 *Restrict Construction Truck Routes*. The SUMC Project sponsors shall be required to deliver and remove all construction-related equipment and materials on truck routes designated by the cities of Palo Alto, East Palo Alto and Menlo Park. Heavy construction vehicles shall be prohibited from accessing the site from other routes. Figure 3.4-6 and 3.4-7 of the EIR illustrates the Stanford Area Truck Routes which must be used by all trucks.	
		TR-1.6 *Protect Public Roadways During Construction*. The SUMC Project sponsors shall be required to repair any structural damage to public roadways, returning any damaged sections to original structural condition. The SUMC Project sponsors shall survey the condition of the public roadways along truck routes providing access to the proposed project site before construction, and shall again survey after construction is complete. A before-and-after survey report shall be completed and submitted to the City of Palo Alto Public Works Department for review, indicating the location and extent of any damage.	
		TR-1.7 *Maintain Public Transit Access and Routes*. The SUMC Project sponsors shall be prohibited from limiting access to public transit, and from limiting movement of public transit vehicles, without prior approval from the Santa Clara County Valley	

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		Transportation Authority or other appropriate jurisdiction. Such approval shall require submittal and approval of specific impacts to a less-than-significant level. Potential actions which would impact access to transit include, but are not limited to, relocating or removing bus stops, limiting access to bus stops or transfer facilities, or otherwise restricting or constraining public transit operations.	
		TR-1.8 *Prepare and Implement Construction Impact Mitigation Plan.* In lieu of the above mitigation measures, the SUMC Project sponsors shall submit a detailed construction impact mitigation plan to the City of Palo Alto for approval by the Director of Public Works prior to commencing any construction activities with potential transportation impacts. This plan shall address in detail the activities to be carried out in each construction phase, the potential transportation impacts of each activity, and an acceptable method of reducing or eliminating significant transportation impacts. Details such as the routing and scheduling of materials deliveries, construction employee arrival and departure schedules, employee parking locations, and emergency vehicle access shall be described and approved.	
		TR-1.9 *Conduct Additional Measures During Special Events.* The SUMC Project sponsors shall implement a mechanism to prevent roadway construction activities from reducing roadway capacity during major athletic events or other special events which attract a substantial number of visitors to the campus. This measure may require a special supplemental permit to be approved by either Santa Clara County or the City of Palo Alto prior to hosting such events during significant construction phases.	

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SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
TR-2. Intersection Level of Service. Implementation of the SUMC Project would result in significant impacts to intersections during Peak Hour conditions.	S	MITIGATION MEASURES. Given the magnitude of the SUMC Project's intersection impacts, there is no single feasible mitigation measure that can reduce the impacts to a less-than-significant level. However, there are a range of measures that, when taken individually, would each contribute to a partial reduction in the SUMC Project's impacts. When combined, these measures could result in a substantial reduction in the SUMC Project's impacts. Under all combinations of feasible mitigation measures below, impacts of the SUMC Project on intersection LOS would remain significant and unavoidable. Of all of the feasible combinations, the one that would have the largest reduction in impact, and that mitigates the greatest number of the intersection impacts, is the combination of traffic adaptive signal technology, additional bicycle and pedestrian undercrossings, enhanced Travel Demand Management (TDM) program, and feasible intersection improvements. This combination of mitigation measures would reduce the SUMC Project impacts to a less-than-significant level at all of the impacted intersections during the AM Peak Hour. However, intersection impacts would remain significant and unavoidable in the PM Peak Hour at three intersections with mitigation. *TR-2.1* *Install Traffic Adaptive Signal Technology*. The SUMC Project sponsors shall contribute to the Palo Alto Citywide Traffic Impact Fee program, for the installation of traffic adaptive signals. However, this fee is not structured to mitigate one hundred percent of project related impacts, and an additional fee could be imposed by the City on the SUMC Project sponsors to mitigate the remaining share of the SUMC Project impacts. In Menlo Park, the SUMC Project sponsors shall contribute their fair share amount, which shall be tied to the amount of traffic added to analyzed intersections by the SUMC Project. The SUMC Project sponsors' contributions shall apply towards the	SU

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		installation of traffic adaptive signals as listed below. • Sand Hill Road (Oak Creek to Shopping Center) - 4 signals • Arboretum Road (Shopping Center to Palm Drive) - 3 signals • Embarcadero Road (Bryant to Saint Francis) - 7 signals • University Avenue (Palm to Lincoln) - 13 signals • Lytton Avenue (Alma to Middlefield) - 10 signals • Hamilton Avenue (Alma to Middlefield) - 10 signals • Middlefield Road (San Antonio to Homer) - 9 signals • Charleston Road (Alma to Middlefield) - 2 signals • El Camino Real (northern city limits of Menlo Park to southern city limits of Palo Alto) – signals would require approval of Caltrans	
		TR-2.2 *Fund Additional Bicycle and Pedestrian Undercrossings*. The SUMC Project sponsors shall contribute their fair share to the cost of construction of the Everett Avenue undercrossing of the Caltrain tracks in Palo Alto and the Middle Avenue undercrossing in Menlo Park. In Palo Alto, there is a Citywide Traffic Impact Fee program that the SUMC Project sponsors shall contribute to. However, this fee is not structured to mitigate one hundred percent of the SUMC Project related impacts, and an additional fee may be imposed by the City to mitigate the remaining share of the SUMC Project impacts. In Menlo Park, the fair share contribution shall be tied to the amount of traffic added to analyzed intersections by the SUMC	

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SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		Project. The construction of the Everett Avenue and Middle Avenue undercrossings would reduce traffic volumes on nearby streets, such as Ravenswood Avenue and University Avenue.	
		TR-2.3 *Enhance Stanford University Travel Demand Management (TDM) Program.* The SUMC Project sponsors shall enhance the currently-implemented TDM program in order to achieve 35.1 percent usage of alternative transportation modes (i.e, carpool, vanpool, bus, Caltrain, bicycle, and walk) by SUMC employees. The initial enhancements to the SUMC TDM program shall include the following: • Provide Caltrain GO Passes, or an equivalent TDM measure, to all eligible hospital employees and set target Caltrain mode share for hospital employees equal to 15.8 percent. • If Caltrain GO Passes would be provided to SUMC employees, make arrangements with AC Transit to lease 75 spaces at the Ardenwood Park & Ride Lot, to serve SUMC employees who commute from the East Bay. • Expand bus service in support of the issuance of GO Passes. • Expand the Marguerite shuttle bus service, and integrate it with the other City of Palo Alto shuttle bus service. • Maintain load factors less than 1.00 on the U Line, and less than 1.25 on the Marguerite shuttle. • Expand and improve the bicycle and pedestrian networks. • Provide a full-time on-site TDM coordinator by 2015 for the hospital components. The coordinator would be responsible for organizing and disseminating TDM information primarily	

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SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		to hospital employees and also to hospital patients. A central location would be made available to provide information on alternative travel modes. Also, the SUMC or hospitals' website would contain information on TDM programs. • Provide a guaranteed ride home program for all employees who use transit and other transport alternatives like carpool and vanpool. The guarantee ride home shall allow employees with dependent children the ability to use alternative modes to travel to and from work but still be able to travel home mid-day in case of an emergency. • Provide employees with shower facilities within the SUMC Sites to encourage bicycling to work. The SUMC Project sponsors shall also provide bicycle storage facilities on the SUMC Sites that would be conveniently located near the employee showers. • Establish, in conjunction with the GO Pass implementation, a "Zip Car" (or other similar car-sharing program) with Zip Cars available at the medical complex. • Perform annual TDM monitoring and submit the report to the City of Palo Alto to ensure that the assumed modal split to alternative forms of travel and away from autos is actually achieved. These enhancements may not immediately change the mode split for SUMC employees, because many employees would be unable to change long standing commute patterns overnight. However, with the passage of a mutually agreed amount of time, it is expected that the enhanced TDM program would gradually result in a shift in the mode split of SUMC employees. If this proves	

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SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		not to be the case, then a second round of improvements to the TDM program shall be implemented. Examples of additional measures could be to increase the parking permit charges while increasing the incentives to those who carpool or do not drive. If, by the year 2025, at least 35.1 percent of SUMC employees are not using alternative transportation modes, then a second round of improvements to the TDM shall be implemented. Examples of additional measures could be to increase the parking permit charges while increasing the incentives to those who carpool or do not drive. Thereafter, SUMC Project sponsors shall monitor/survey employee use of alternative modes of transportation on an at least bi-annual basis, and shall continue to improve its TDM program, until it is confirmed to the satisfaction of the City that the target of 35.1 percent usage has been met. TR-2.4 *Fund or Implement those Intersection Improvements that Have Been Determined to be Feasible*. The SUMC Project sponsors shall implement the following measures: • For the intersection of El Camino Real/Page Mill Road - Oregon Expressway, the SUMC Project sponsors shall pay a fair share towards (1) provision of exclusive right-turn lane for westbound Oregon Expressway, in addition to the two through lanes, (2) increasing the cycle length to 160 seconds. Improvements to the westbound right turn lane would require right-of-way from the Santa Clara Valley Transportation Authority (VTA) park-and-ride lot. • At the intersection of Arboretum Road/Galvez Street, the SUMC Project sponsors shall install a traffic signal.	

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Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		TR-2.5 *Coordinate with Other Jurisdictions for Potentially Feasible Roadway Improvements*. The City of Palo Alto shall work with other jurisdictions to try to achieve feasibility for the following roadway improvements or adjustments. In the event that one or more of the below improvements would then be determined to be feasible, the SUMC Project sponsors shall pay their fair share towards implementation of the improvements, if a fair share contribution would apply. • Alpine Road/I-280 Northbound Off-Ramp - Signalize this intersection. The City shall coordinate with Caltrans regarding feasibility of these improvements. • El Camino Real/Ravenswood Avenue - Re-stripe the exclusive right-turn lane on southbound El Camino Real to a shared through/right lane. Also, provide an additional through lane for northbound El Camino Real by removing the right-turn slip island. Also, provide an exclusive right-turn lane for eastbound Menlo Avenue. The City shall coordinate with the City of Menlo Park and Caltrans regarding feasibility of these improvements. • Bayfront Expressway/Willow Road - Provide one more right-turn lane for eastbound Willow Road and make the right-turn movement for southbound Bayfront Expressway "overlap" with the left-turn of eastbound Willow Road. The intersection has signals for the right-turn movement for southbound Bayfront Expressway, but the "overlap" phase is not implemented. The City shall coordinate with the City of Menlo Park regarding feasibility of these improvements. • Middlefield Road/Ravenswood Avenue - Provide an additional exclusive left-turn lane for northbound Middlefield	

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Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		Road. The City shall coordinate with the City of Menlo Park regarding feasibility of this improvement. • Junipero Serra Boulevard/Campus Drive West – Request that Santa Clara County change the signal cycle length at this intersection to 90 seconds. The City shall coordinate with the County of Santa Clara regarding feasibility of this adjustment.	
TR-3. Impacts on Roadway Segments. The SUMC Project would result in adverse traffic impacts to roadway segments in the City of Menlo Park.	S	MITIGATION MEASURES. With the provision of additional bicycle and pedestrian undercrossings (Mitigation Measure TR-2.2), the enhanced TDM program (Mitigation Measure TR-2.3), and contribution to the City of Menlo Park shuttle fee (Mitigation Measure TR-7.2), there would still be significant impacts on four Menlo Park roadways, including Marsh Road, Willow Road, Sand Hill Road, and Alpine Road. Therefore, the traffic impacts to Marsh Road, Sand Hill Road, Willow Road, and Alpine Road would remain significant and unavoidable with mitigation.	SU
TR-4. Local Circulation Impacts. The SUMC Project could result in significant traffic impact to the local circulation network in the immediate vicinity of the SUMC Sites.	S	MITIGATION MEASURES. Mitigation Measure TR-4.1, involving funding and implementation of a traffic impact study, and Mitigation Measure TR-4.2, involving re-striping of Durand Way, would reduce the SUMC Project's impact to a less-than-significant level. *TR-4.1* *Fund Traffic Impact Study*. Upon construction of the SHC and LPCH Hospital components, the SUMC Project sponsors shall fund an independent traffic evaluation, commissioned by the City, based on actual travel patterns, volumes, and emergency access, with an emphasis on ease of circulation around and through the medical complex to determine if the private street connection between Roth Way and Pasteur Drive should be operated as a public street. If the independent traffic study demonstrates that the connection between Roth Way and Pasteur Drive as a public street would improve circulation, then the	LTS

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Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		connection shall be designated as a public street for all vehicular, bicycle, pedestrian, and transit traffic. *TR-4.2* *Fund Signing and Striping Plan and Signal Optimization*. In addition to paying for the construction of the extension of Durand Way from Sand Hill Road to Welch Road, the SUMC Project sponsors shall also pay for the following improvements to ensure that queues from the Durand Way/Sand Hill Road intersection do not spillback onto the Durand Way/Welch Road intersection. • A signing and striping plan for the Durand Way extension, which would maximize the storage capacity by creating a four-lane roadway with a left and through/right at Sand Hill Road and a right and through/left at Welch Road; • The installation and optimization of the two signals at the intersections of Durand Way/Sand Hill Road and Durand Way/Welch Road.	
TR-5. Freeway Impacts. The SUMC Project would result in less-than-significant impacts on freeways.	LTS	None required.	N/A
TR-6. Bicycle and Pedestrian Impacts. The SUMC Project could impede the development or function of planned bicycle or pedestrian facilities, and result in a significant impact.	S	MITIGATION MEASURES. Mitigation Measure TR-2.3 involving trip-reducing measures, plus Mitigation Measure TR-6.1, which involves several bicycle and pedestrian improvements, would reduce the SUMC Project's impact to a less-than-significant level. The improved facilities would mitigate the hazards to pedestrians and bicyclists brought about by the increased vehicular traffic and congestion. *TR-6.1* *Bicycle and Pedestrian Infrastructure Improvements***.** The SUMC Project sponsors shall fund the expansion and improvement of the bicycle and pedestrian network in the immediate vicinity of the SUMC Project. The intent of these improvements is to:	LTS

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Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		• reduce auto related traffic by providing the infrastructure for alternative travel modes; • improve the bicycle and pedestrian linkages between the SUMC Project and Downtown Palo Alto, and between the SUMC Project and the surrounding residential neighborhoods; and • mitigate the safety hazards to pedestrians and cyclists that will result from the SUMC Project related increase in vehicular traffic and congestion. The specific improvements to be funded by the SUMC Project sponsors shall include the following: • Provide an enhanced pedestrian crossing at Quarry Road/El Camino Real to establish a strong connection between the SUMC Project and Downtown Palo Alto. The pedestrian crossing shall be 12 feet wide, have contrasting pavement, countdown signal heads, and high visibility markings. Even though the intersection of Quarry Road and El Camino Real is projected to operate at acceptable levels of service, added vehicular traffic through the intersection and added bicycle and pedestrian volumes across the intersection would potentially create safety hazards which would be mitigated by the proposed enhanced crossings. • Create a bicycle and pedestrian connection between the Stanford Shopping Center and SUMC. The connection shall provide an alternative route to Quarry Road, which is auto dominated. This connection shall extend between Vineyard Lane and Welch Road. Pedestrian traffic signals and crosswalks shall be placed at the crossing of Vineyard Lane	

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Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		and Welch Road. The crosswalk shall be enhanced either by striping or by the use of contrasting paving. • Provide a connection from the planned Everett Avenue bicycle and pedestrian undercrossing to the El Camino Real/Quarry Road intersection. Once the tunnel is completed, this linkage shall provide a direct connection between the SUMC Project and Downtown North. • Provide a bicycle and pedestrian trail through the Arboretum Drive as part of future campus planning in the SUMC area. This trail shall improve access to the SUMC Project. To support this off-street path, bicycle and pedestrian crossings at Arboretum Road and Palo Road shall be enhanced to provide safe crossing of these streets. The crosswalks shall be properly signed, marked, and lighted with enhanced pavement markings and imbedded crosswalk lights. Signalization of this crossing may ultimately be required. • Incorporate into the Quarry Road corridor, from El Camino Real to Welch Road, continuous sidewalks according to the SUMC Project's Design Guidelines. The extension of Quarry Road west of Welch Road shall continue the pedestrian facilities into the SUMC Project. • Enhance all signalized intersections in the Project Vicinty, particularly along Quarry Road, Vineyard, and Welch Roads to include 12-foot pedestrian crosswalks on all legs, with textured or colored paving or diagonal or longitudinal zebra striping as determined by the City, pedestrian push buttons and countdown pedestrian signal heads, and other specific improvements that are determined as necessary during the design process, such as median refuge islands, advanced signing, flashing beacons, in-pavement lighting, etc.	

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		• Install the appropriate number of Class I and Class III bicycle parking spaces as required by the City's Zoning Ordinance for the total amount of existing and future development. The SUMC Project sponsors shall install the required number of bicycle parking spaces equally distributed throughout the SUMC Sites.	
TR-7. Transit Impacts. Implementation of the SUMC Project could impede the operation of the transit system as a result of increased ridership, and result in a significant impact.	S	MITIGATION MEASURES. Mitigation Measure TR-7.1 involves the addition of transit centers to the SUMC Project's site plans, and Mitigation Measure TR-7.2 involves financial contributions towards the expansion of transit service. Implementation of these measures would reduce the SUMC Project's transit impacts to a less-than-significant level. *TR-7.1* *Incorporate Transit Centers Into Site Plans*. The SUMC Project sponsors shall revise their SUMC Project site plan to incorporate two transit centers to reduce the impact to transit service caused by the SUMC Project. These transit centers shall be located at Hoover Pavilion and at SHC, and shall be off-street facilities. The transit centers shall accommodate three to four buses simultaneously, and shall have shelters, seating, lighting, signs, maps, bus schedules, and bicycle parking. On-street bus stops along Welch Road and Quarry Road shall also be provided, but the transit centers shall accommodate the majority of transit riders and shall be located to maximize the convenience of employees, patients, and visitors. One transit center shall be located in the vicinity of Welch Road and Pasteur Drive to serve SHC. The other transit center shall be located near the entrance to Hoover Pavilion. Both of these transit centers shall provide the focal point for transit use for the SUMC. *TR-7.2* *Provide Expanded Transit Service*. The SUMC Project sponsors shall make a fair share financial contribution to the cost of expanding existing bus service of the Marguerite, Crosstown,	LTS

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		and Menlo Park Shuttle bus services, and to the VTA Community Bus Service. • **Marguerite Shuttle.** The SUMC Project sponsors shall make a financial contribution to expand the Marguerite shuttle service into Palo Alto. • **U Line.** The SUMC Project sponsors shall make a financial contribution towards the operation of the U Line. Arrangements with AC Transit shall be made to increase U Line service (such as decreasing headways) to meet the increase in demand attributable to the SUMC Project, and ensure that load factors remain below 1.0. • **Crosstown Shuttle.** The SUMC Project sponsors shall participate in operating the Palo Alto Crosstown Shuttle service, by contributing to the Citywide Traffic Impact Fee, which would include covering the costs of this service. Then current fee is $2,861 per net new PM Peak Hour trips. A portion of Stanford's Citywide Traffic Impact Fee shall be used by the City to expand City shuttle services. • **VTA Community Bus Service.** The SUMC Project sponsors shall contribute to fund the project's fair share of Palo Alto's share of expanded VTA Community Bus Service. • **Menlo Park Shuttle Bus.** The SUMC Project sponsors shall pay into the City of Menlo Park shuttle fee at $0.105 per square foot of new development annually or a percentage agreed between Menlo Park and SUMC Project sponsors. In Menlo Park, the contribution shall be tied to the amount of project traffic added to analyzed roadway segments and intersections.	

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SUMC Project Summary of Impacts and Mitigation Measures

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TR-8. Parking Impacts. The SUMC Project would provide adequate parking for its demand, and would thus have a less-than-significant parking impact.	LTS	None required.	N/A
TR-9. Emergency Access. Implementation of the SUMC Project could potentially result in inadequate emergency access due to increased congestion, a significant impact.	S	MITIGATION MEASURES. Mitigation Measure TR-9.1 involves the installation of emergency vehicle traffic signal priority (OptiCom) at all intersections significantly impacted by the SUMC Project. Implementation of this measure would reduce the SUMC Project's impact to less-than-significant levels. *TR-9.1* *Pay Fair Share Towards OptiCom Installation*. The SUMC Project sponsors shall pay their fair-share financial contribution towards the City of Palo Alto, to assist with the installation and operation of emergency vehicle traffic signal priority (OptiCom) at all significantly impacted intersections.	LTS
TR-10. Cumulative Construction Impacts. The SUMC Project, in combination with concurrent construction projects in the vicinity of the SUMC Sites, could result in a significant construction-period impact. The contribution of the SUMC Project would be cumulatively considerable.	S	MITIGATION MEASURES. With implementation of Mitigation Measures TR-1.1 through TR-1.9, which involve transportation-related construction management measures, the SUMC Project's contribution to the significant cumulative construction-period impact would be reduced to less than cumulatively considerable.	LTS
TR-11. Cumulative Transit Impacts. Cumulative growth would result in a less-than-significant cumulative impact on transit services.	LTS	None required.	N/A
3.5 Air Quality			
AQ-1. Construction Criteria Air Pollutant Emissions. Without mitigation, construction activities associated with the SUMC Project could cause emissions of dust and pollutants from equipment exhaust that could contribute to existing air quality violations or expose sensitive receptors to substantial pollutant concentrations. Impacts would be significant.	S	MITIGATION MEASURES. To minimize dust emissions, the Bay Area Air Quality Management District (BAAQMD) has identified a set of feasible PM_{10} control measures for all construction activities in the air basin. Implementation of the BAAQMD-recommended measures (Mitigation Measure AQ-1.1 below) would reduce the impacts caused by construction dust to a less-than-significant level. Additionally, implementation of	SU

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Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		construction equipment emission reduction measures (Mitigation Measure AQ-1.2 below) would further reduce NOx, ROG, PM_{10} and $PM_{2.5}$ emissions during construction. However, reduction of NOx emissions below 80 lbs/day during the first year of construction could not be guaranteed, and this impact would still be considered significant and unavoidable. *AQ-1.1* *Implement Recommended Dust Control Measures*. To reduce dust emissions during project demolition and construction phases, the SUMC Project sponsors shall require the construction contractors to comply with the dust control strategies developed by the BAAQMD. The SUMC Project sponsors shall include in construction contracts the following requirements: a. Cover all trucks hauling soil, sand, and other loose materials including demolition debris, or require all trucks to maintain at least two feet of freeboard; b. Water all active construction areas (exposed or disturbed soil surfaces) at least twice daily; c. Use watering to control dust generation during demolition of structures or break-up of pavement; d. Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved parking areas and staging areas; e. Sweep streets daily (with water sweepers) all paved access roads, parking areas and staging areas during the earthwork phases of construction; f. Sweep daily (with water sweepers) if visible soil material is carried onto adjacent public streets; g. Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more);	

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Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		h. Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.); i. Limit traffic speeds on unpaved roads to 15 mph; j. Install sandbags or other erosion control measures to prevent silt runoff to public roadways; and k. Replant vegetation in disturbed areas as quickly as possible.	
		AQ-1.2 *Implement Equipment Exhaust Emission Reduction Measures*. To reduce emissions from construction equipment during project demolition and construction phases, the SUMC Project sponsors shall require the construction contractors to comply with the following emission reduction strategies to the maximum feasible extent. The SUMC Project sponsors shall include in construction contracts the following requirements: a. Where possible, electrical equipment shall be used instead of fossil-fuel powered equipment. b. The contractor shall install temporary electrical service whenever possible to avoid need for fossil-fuel powered equipment. c. Running equipment not being actively used for construction purposes for more than five minutes shall be turned off. (e.g., trucks waiting to deliver or receive soil, aggregate, or other bulk materials; however, rotating-drum concrete trucks may keep their engines running continuously as long as they are on site). d. Trucks shall be prohibited from idling while on residential streets serving the construction site (also included in Mitigation Measure NO-1.1).	

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		e. Diesel-powered construction equipment shall be Tier III or Tier IV California Air Resources Board (CARB) certified equipment to the maximum feasible extent. f. The engine size of construction equipment shall be the smallest practical to accomplish the task at hand.	
AQ-2. Operational Criteria Air Pollutant Emissions. Combined mobile and stationary source emissions during operation of the SUMC Project would exceed the Bay Area Air Quality Management District's significance threshold of 80 pounds/day of ROG, NOx and PM_{10}. Therefore, air emissions would result in a substantial contribution to an existing regional air quality problem and a significant impact.	S	MITIGATION MEASURES. Mitigation Measure TR-2.3 involves implementation of enhanced TDM measures. The enhanced TDM measures include provision of the Caltrain GO Pass to SUMC employees, or an equivalent TDM measure. If the GO Pass would be provided, then remote parking spaces at the Ardenwood Park and Ride Lot in the East Bay would also be provided to serve commuters from the East Bay. Provision of the GO Pass plus remote parking spaces in the East Bay would reduce Vehicle Miles Travelled by 13.5 percent. This reduction in SUMC Project VMT, however, would not be sufficient to prevent project ROG, NOx and PM_{10} emissions from exceeding the BAAQMD significance thresholds. In addition, the City shall consider the feasibility of Mitigation Measure PH-3.1. Nonetheless, impacts would be significant and unavoidable even with mitigation.	SU
AQ-3. Localized Carbon Monoxide Impacts from Motor Vehicle Traffic. The SUMC Project would have less-than-significant localized air emissions resulting from additional traffic.	LTS	None required.	N/A
AQ-4. Toxic Air Contaminants. Simultaneous exposures to DPM and TACs from the construction and operational components of the SUMC Project would have a less-than-significant impact on air quality.	LTS	None required.	N/A

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Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
AQ-5. Objectionable Odors. The SUMC Project would have a less-than-significant impact related to exposing the public to objectionable odors that would affect a substantial number of people.	LTS	None required.	N/A
AQ-6. Cumulative Construction Emissions. Construction equipment NOx emissions associated with the SUMC Project could contribute considerably to regional air quality problems.	S	MITIGATION MEASURES. Mitigation Measures AQ-1.1 and AQ-1.2 would reduce the SUMC Project's contribution to cumulative construction emissions, although the contribution to NOx would remain cumulatively considerable.	SU
AQ-7. Cumulative Operational Emissions. SUMC Project operation could contribute considerably to a degradation of regional air quality as defined by the BAAQMD.	S	MITIGATION MEASURES. Mitigation Measure TR-2.3 involves implementation of enhanced TDM measures. The enhanced TDM measures include provision of the Caltrain GO Pass to SUMC employees, or an equivalent TDM measure. If the GO Pass would be provided, then remote parking spaces at the Ardenwood Park and Ride Lot in the East Bay would also be provided to serve commuters from the East Bay. As additional mitigation, the City shall consider the feasibility of Mitigation Measure PH-3.1, as identified and discussed in more detail in Section 3.13, Population and Housing. These measures would reduce the contribution to criteria pollutants during operation of the SUMC Project. However, even with mitigation, emissions would still exceed the BAAQMD significance thresholds, and the contribution would remain considerable.	SU
AQ-8. Cumulative Construction and Operational TAC Emissions. SUMC Project TAC emissions could contribute considerably to the health risk of sensitive receptors on and near the SUMC Project site and, thus, have a significant cumulative impact.	S	MITIGATION MEASURE. Mitigation Measure AQ-1.2 (Implement Equipment Exhaust Emission Reduction Measures) has been identified primarily to reduce construction-phase criteria pollutant emissions, but it would also reduce Diesel Particulate Matter (DPM) emissions. However, the emissions of criteria and DPM emissions from project construction sources were based on current best estimates of the type, number, and duration of use of the SUMC Project construction equipment. While some additional reductions of Toxic Air Contaminants (TACs) would be expected with Mitigation Measure AQ-1.2, where their implementation is feasible, their	SU

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Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		potential additional reductions were not included in the SUMC Project's DPM estimates that were the basis of the Health Risk Assessment. However, it is not likely that the additional reductions in SUMC Project TAC emissions resulting from their implementation would reduce the SUMC Project health risk to the point where it would not be cumulatively considerable in the context of Palo Alto's high TAC background levels. Thus, SUMC Project TAC emissions would remain cumulatively significant even after the implementation of all feasible TAC reduction measures.	
3.6 Climate Change			
CC-1. Furthering Goals and Policies of the Palo Alto Climate Protection Plan. The proposed Emissions Reduction Program would minimize greenhouse gas emission increases associated with the proposed development program. However, the proposed Emissions Reduction Program would not be sufficient to further the goals of the City's Climate Protection Plan.	S	MITIGATION MEASURES. The mitigation measures below, which in addition to the proposed Emissions Reduction Program, would further minimize the increase in greenhouse gas emissions from this project. However, even with these measures the SUMC Project would contravene the goals in the City's Climate Protection Plan and would have a cumulatively considerable contribution to global climate change. *CC-1.1* *Commission and Retro-Commission Energy Systems for New and Existing Buildings*. New construction and existing buildings altered by construction of the SUMC Project shall undergo commissioning of energy and HVAC systems during construction and on an annual basis during the first five years of operation. The commissioning process shall follow the standards of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Guideline 0-2005 or the International Performance Measurement and Verification Protocol (MVP). This process would ensure that new and existing energy systems would perform interactively according to construction documents, the SUMC Project design intent and the owner's operational needs.	SU

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		CC-1.2 *Participate in Palo Alto Green Energy Program, Other Equivalent Renewable Energy Program, or combination thereof.* Under the Palo Alto Green program, residential, business and industrial customers purchase renewable energy equivalent to their electricity needs at an additional cost of 1.5 cents per kWh above standard electric rates. The SHC and LPCH facilities shall participate in this program to offset electricity emissions; develop new renewable generation sources in collaboration with the CPAU; incorporate a renewable energy source (such as photovoltaics) into the SUMC Project, or a combination thereof, such that a minimum of 54,640 MWh of electricity usage is offset annually.	
		CC-1.3 *Provide Annual Greenhouse Gas Reporting*. The SHC and LPCH shall perform an annual inventory of greenhouse gas emissions associated with hospital and medical facilities on the SUMC Sites. This inventory shall be performed according to a common industry-standard emissions reporting protocol, such as the approaches recommended by California Air Resources Board, The Climate Action Registry, or Business Council for Sustainable Development (BCSD). This inventory shall be shared with the City of Palo Alto to facilitate the development of future collaborative Emissions Reduction Programs. Emissions associated with energy, water, solid waste, transportation, employee commute and other major sources shall be reported in this inventory.	
		CC-1.4 *Prepare Waste Reduction Audit*. The SUMC Project sponsors shall perform a waste reduction audit of waste management practices at the hospitals prior to construction of new facilities and after completion of the SUMC Project to determine post-project diversions. This audit shall be repeated annually, and	

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		with the results being made available to the public or to City of Palo Alto staff. *CC-1.5* *Implement Construction Period Emission Reduction Measures*. Prior to the issuance of a grading permit the SUMC Project sponsors shall incorporate the following measures into the construction phasing plan and submit to City Planning for approval. • Use alternative-fueled (e.g., biodiesel, electric) construction vehicles/ equipment of at least 15 percent of the fleet; • Use local building materials of at least 10 percent; and • Recycle at least 50 percent of construction or demolition materials.	
CC-2 Emit Significant Greenhouse Gas Emissions. The proposed Emissions Reduction Program would minimize the greenhouse gas emission increases associated with the proposed development program, although the proposed Emissions Reduction Program would not reduce emissions to 30 percent below business as usual (BAU) emissions. Therefore the SUMC project would have a cumulative considerable contribution to global climate change.	S	MITIGATION MEASURE. Mitigation Measures CC-1.1 through CC-1.5, and TR-2.3 would reduce greenhouse gas emissions. In addition, to further reduce impacts related to greenhouse gas emissions, the City shall consider the feasibility of Mitigation Measure PH-3.1. However, even with the implementation of all feasible mitigation measures, the anticipated emissions would remain above both the City of Palo Alto's Climate Protection Plan and the CARB's reduction emission goals of 30 percent below BAU emissions. Because these reduction levels cannot be achieved, the SUMC Project would emit significant amounts of greenhouse gases and would have a cumulatively considerable contribution to global climate change.	SU

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SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
3.7 Noise			
NO-1. Construction Noise. Construction of the SUMC Project would create a substantial temporary increase in ambient noise levels on the SUMC Sites compared to existing ambient noise levels. The noise increase would be a significant impact to the sensitive uses (i.e., patients) on the Main SUMC Site during construction.	S	MITIGATION MEASURE. The following mitigation measures would not reduce construction noise impacts to on-site sensitive receptors to less-than-significant levels, although they would lessen construction-related noise. *NO-1.1 Implement Best Management Practices to Reduce Construction Noise.* The SUMC Project sponsors shall incorporate the following practices into the construction documents to be implemented by the SUMC Project contractor: a. Provide enclosures such as heavy-duty mufflers for stationary equipment, shrouding or shielding for impact tools, and barriers around particularly noisy operations on the site. b. Use quiet construction equipment whenever possible, particularly air compressors. c. Provide sound-control devices on equipment no less effective than those provided by the manufacturer. d. Locate stationary equipment, material stockpiles, and vehicle staging areas as far as practicable from sensitive receptors. e. Prohibit unnecessary idling of internal combustion engines. f. Require applicable construction-related vehicles and equipment to comply with the City's truck route ordinance. g. Designate a noise disturbance coordinator who shall be responsible for responding to complaints about noise during construction. The telephone number of the noise disturbance coordinator shall be conspicuously posted at the construction site and shall be provided to the City. Copies of the construction schedule shall also be posted at nearby noise-sensitive areas.	SU

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NO-2. Construction Vibration. Construction of the SUMC Project would have less-than-significant vibration impacts.	LTS	None required.	N/A
NO-3. Operational Noise Impacts from Transportation Sources. Increased traffic and helicopter noise levels due to implementation of the SUMC Project would be less than significant. However, noise from ambulances due to implementation of the SUMC Project would increase along Sand Hill Road west of El Camino Real, and would increase roadside noise levels by an amount considered unacceptable under the policies of the City Comprehensive Plan.	S	MITIGATION MEASURE. No mitigation measure (short of forbidding ambulance access to the new emergency room via the Durand Way access route; a measure that may be practically impossible given the emergency nature of ambulance activity) would prevent or reduce the identified SUMC Project-related ambulance noise impact at the noise-sensitive uses along Sand Hill Road. As such, the impact would be significant unavoidable impact.	SU
NO-4. Operational Stationary Source Noise Impacts. Operational stationary source noise generated by the SUMC Project could potentially increase ambient noise levels in the vicinity of the SUMC Sites and result in a significant impact.	S	MITIGATION MEASURE. The following mitigation measure would reduce noise impacts to sensitive receptors from HVAC equipment and emergency generators proposed for SUMC Project. Implementation of this measure would reduce the SUMC Project's noise impacts at 1100 Welch Road. *NO-4.1* *Shield or Enclose HVAC Equipment and Emergency Generators*. Noise levels from mechanical equipment shall be minimized to the degree required by the City Noise Ordinance by proper siting and selection of such equipment and through installation of sufficient acoustical shielding or noise emission controls. Noise levels for the emergency generators near Welch Road shall be reduced such that noise levels do not exceed the City's General Daytime Exception standard of 70 dBA at 25 feet. An acoustical analysis shall be prepared by a qualified professional to ensure that the new mechanical equipment is in compliance with noise standards of the Noise Ordinance.	LTS

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NO-5. Cumulative Construction Noise Impacts. If other foreseeable construction in the immediate vicinity of the SUMC Sites would occur simultaneously with the proposed SUMC Project construction, then significant cumulative noise impacts to adjacent residential and other noise-sensitive uses could occur. The SUMC Project's contribution would likely be cumulatively considerable.	S	MITIGATION MEASURE. Although measures under Mitigation Measure NO-1.1 would lessen the resulting noise contribution from the construction of the SUMC Project at 1100 Welch Road and on-site receptors, the contribution of the SUMC Project construction noise would remain cumulatively considerable.	SU
NO-6. Cumulative Construction Vibration Impacts. Vibration during construction activities under the cumulative scenario would result in a less-than-significant cumulative impact.	LTS	None required.	N/A
NO-7. Cumulative Operational Transportation Source Noise Impacts. Cumulative development would result in less-than-significant cumulative noise impacts.	LTS	None required.	N/A
NO-8. Cumulative Operational Stationary Source Noise Impacts. Cumulative development would not result in a significant increase in cumulative noise levels from operational stationary sources at sensitive receptors.	LTS	None required.	N/A
3.8 Cultural Resources			
CR-1. Impacts on Historical Resources. The SUMC Project would have a significant impact on historical resources.	S	MITIGATION MEASURES. Implementation of the Mitigation Measures CR-1.1 and CR-1.5 would reduce potential vibration and construction-related impacts to the Hoover Pavilion resulting from demolition of adjacent sheds and storage facilities, impacts from falling construction debris, and impacts from movement of heavy equipment to a less-than-significant level. Implementation of Mitigation Measures CR-1.2 through CR-1.4 would reduce impacts due to the loss of the Stone Building complex; however, the impact would remain significant and unavoidable.	SU

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		Mitigation Measure CR-1.5 requires implementation of the Stanford Hoover Pavilion Protection Documents (Documents) prepared by ARG and dated September 21, 2009 (see Appendix J). These Documents provide specifications for the treatment and protection of the Hoover Pavilion during SUMC Project construction activities that could damage the historic fabric of the building including the installation of protective covering of certain exterior surfaces and the removal, cataloging, and storage of selective historic elements. The Documents are based on National Park Service and National Fire Protection Agency protection guidelines and include details on materials and methods of installation for the protective coverings to prevent damage from nearby demolition. Proper installation, as required in the Documents would prevent the protective covering itself from damage the building. The removal of historic elements would ensure their protection of some of the more fragile elements from construction activities and property cataloging and storage of such elements would ensure their proper care and reinstallation. The Documents include such details as specifying under what weather conditions it is acceptable to perform the various tasks that could be negatively impacted by different weather conditions. Any variations on the specifications of the Documents would not be allowed without prior consultation with ARG, or a qualified preservation architect. Refer to Appendix J, Stanford Hoover Pavilion Protection Documents, for a complete list of specifications for the Hoover Pavilion. *CR-1.1* *Manually Demolish Structures at the Hoover Pavilion Site.* Where feasible, the project sponsors shall establish a perimeter of construction fencing around the Hoover Pavilion at a minimum of 25 feet to establish a protective buffer around the building. The demolition of these sheds and storage facilities shall be accomplished manually without the use of vibration causing equipment. Additional protective fencing at a height sufficient to prevent any debris from hitting the building shall	

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		also be installed between the Hoover Pavilion and demolition activities occurring within the 25 foot buffer.	
		CR-1.2 *Prepare HABS Documentation for the Stone Building Complex.* The SUMC Project sponsors shall prepare HABS-like documentation using the National Park Services' Historic American Building Surveys Level III guidelines for each of the buildings in the Stone Building complex prior to demolition of each building that comprises this historic resource (East, West, Core, Boswell, Edwards, Lane, Alway, and Grant). HABS-like recordation shall not be required until each of the individual buildings is vacated and prepared for demolition. The documentation shall include written and photographic documentation of each of the historic structures within the Stone Building complex. The documentation shall be prepared by a qualified professional meeting the Secretary of the Interior's Professional Qualifications Standards for Architectural History or History. The documentation shall be prepared based on the National Park Services' HABS standards and include, at a minimum, the following: • Site-specific history and appropriate contextual information regarding the Stone Building complex. This history shall focus on the reasons for the buildings' significance: heart transplantation program and the role of E.D. Stone in the design of the complex. • Accurate mapping of all buildings that are included in the Stone Building complex, scaled to indicate size and proportion of the buildings to surrounding buildings; if existing plans accurately reflect these relationships these may	

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		be reformatted for submittal per HABS guidelines for CAD submittals. • Architectural descriptions of the major exterior features and public rooms within the Stone Building complex as well as descriptions of typical patient, office, laboratory, and operating rooms. • Photographic documentation of the interior and exterior of the Stone Building complex and Thomas Church-designed landscape features. Either HABS standard large format or digital photography may be used. If digital photography is used, the ink and paper combinations for printing photographs must be in compliance with National Register-National Historic Landmark photo expansion policy and have a permanency rating of approximately 115 years. Digital photographs will be taken as uncompressed .TIF file format. The size of each image shall be 1600x1200 pixels at 300 ppi (pixels per inch) or larger, color format, and printed in black and white. The file name for each electronic image shall correspond with the Index to Photographs and photograph label. *CR-1.3* *Distribute Written and Photographic Documentation to Agencies.* The written and photographic documentation of historic resources shall be disseminated on archival-quality paper to Stanford University, the Northwest Information Center, and other local repositories identified by the City of Palo Alto. *CR-1.4* *Prepare Permanent Interpretive Displays/Signage/Plaques.* The SUMC Project sponsors shall install interpretive displays within the SUMC Sites that provide information to visitors and residents regarding the history of the Stone Building complex. These	

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		displays shall be installed in highly visible public areas such as the property's open space or in public areas on the interiors of buildings. The displays shall include historical data and photographs as well as physical remnants of architectural elements. Interpretive displays and the signage/plaques installed on the property shall be sufficiently durable to withstand typical Palo Alto weather conditions for at least five years. Displays and signage/plaques shall be lighted, installed at pedestrian-friendly locations, and be of adequate size to attract the interested pedestrian. Maintenance of displays and signage/plaques shall be included in the maintenance program on the property. Location and materials for the interpretative displays shall be subject to review by the Palo Alto Architectural Review Board and approval by the Planning Director.	
		CR-1.5 *Implement Protection Documents for the Hoover Pavilion.* The SUMC Project sponsors shall ensure the implementation of the Stanford Hoover Pavilion Protection Documents (Documents) prepared by ARG and dated September 21, 2009. The SUMC Project sponsors shall comply with the specifications for the treatment and protection of the Hoover Pavilion during SUMC Project construction activities that could damage the historic fabric of the building as provided in the Documents.	
CR-2. Impacts on Prehistoric or Archaeological Resources. The SUMC Project could potentially encounter archaeological resources and result in a significant impact.	S	MITIGATION MEASURE. Mitigation Measure CR-2.1 provides discovery and evaluation procedures for any previously unknown archaeological resources on the SUMC Sites and requires that a professional archaeologist employ preservation in place, data recovery, or other methods that meet the Secretary of the Interior's Standards for Archaeological Documentation to reduce impacts on unique archaeological resources. Therefore, implementation of the following mitigation measure would ensure the impact remains less than significant. (LTS)	LTS

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		CR-2.1 *Construction Staff Training and Consultation*. Prior to any construction or earth-disturbing activities, a qualified archaeologist shall inform construction supervisors of the potential to encounter cultural resources. All construction personnel shall be instructed to be observant for prehistoric and historic-era artifacts, subsurface archaeological features or deposits, including accumulations of dark, friable soil ("midden"), stone artifacts, animal bone, and shell. In the event that any prehistoric or historic subsurface archaeological features or cultural deposits are discovered during construction-related earth-moving activities, all ground-disturbing activity within 100 feet of the resources shall be halted and the City shall be notified. The City shall consult with the Stanford University Archeologist to assess the significance of the find. If the find is determined to be an historical resource or a unique archaeological resource as defined by CEQA, then representatives of the City and the Stanford University Archaeologist shall meet to determine the appropriate course of action. All significant cultural materials recovered shall be subject to scientific analysis, professional museum curation, and a report shall be prepared by the qualified archaeologist according to current professional standards.	
CR-3. Impacts on Human Remains. The SUMC Project could potentially encounter human remains and result in a significant impact.	S	MITIGATION MEASURE. Mitigation Measure CR-3.1 summarizes the procedures to be taken in the event that any previously unknown human remains are discovered on the SUMC Sites. Therefore, implementation of the following mitigation measure would ensure that the potential impact remains less than significant. *CR-3.1* *Conduct Protocol and Procedures for Encountering Human Remains*. If human remains (including disarticulated or cremated remains) are discovered at any SUMC Project construction site during any phase of construction, all ground-disturbing activity	LTS

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		within 100 feet of the human remains should be halted and the Stanford University Archaeologist, City of Palo Alto, and the County coroner notified immediately, according to Section 5097.98 of the State Public Resources Code and Section 7050.5 of California's Health and Safety Code. If the remains are determined by the County coroner to be Native American, the Native American Heritage Commission (NAHC) shall be notified within 24 hours, and the guidelines of the NAHC adhered to in the treatment and disposition of the remains. The SUMC Project sponsors shall retain a professional archaeologist with Native American burial experience to conduct a field investigation of the specific site and consult with the Most Likely Descendant, if any, identified by the NAHC. As necessary, the archaeologist may provide professional assistance to the City of Palo Alto, including the excavation and removal of the human remains. If the human remains cannot be avoided, and the Most Likely Descendant requests that the human remains be removed from its location, the SUMC Project sponsors shall implement removal of the human remains by a professional archaeologist. The City of Palo Alto shall verify that the mitigation is complete before the resumption of ground-disturbing activities within 100 feet of where the remains were discovered.	
CR-4. Impacts on Paleontological Resources. The SUMC Project could have a significant impact on unique paleontological resources or unique geologic resources.	S	MITIGATION MEASURE. Mitigation Measure CR-4.1 provides protocol for encountering paleontological resources and would reduce the potential impacts resulting from disruption to unique paleontological resources to a less-than-significant level. *CR-4.1* *Conduct Protocol and Procedures for Encountering Paleontological Resources*. Should paleontological resources be identified during SUMC Project ground-disturbing activities, the SUMC Project sponsors shall notify the City and the Stanford	LTS

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		University Archaeologist and cease operations in the vicinity of the potential resource until a qualified professional paleontologist can complete the following actions when appropriate: • Identify and evaluate paleontological resources by intense field survey where impacts are considered high; • Assess effects on identified resources; and • Consult with the City of Palo Alto and the Stanford University Archaeologist. Before operations in the vicinity of the potential resource resume, the SUMC Project sponsors shall comply with the paleontologist's recommendations to address any significant adverse effects where determined by the City of Palo Alto to be feasible. In considering any suggested mitigation proposed by the consulting paleontologist, the SUMC Project sponsors shall consult with the Stanford University Archaeologist and the City to determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, cost policies and land use assumptions, and other considerations. If avoidance is infeasible, other appropriate measures (e.g. data recovery) shall be instituted to avoid a significant impact. Work may proceed in other parts of the SUMC Sites while mitigation for paleontological resources is completed.	

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
CR-5. Cumulative Impacts on Historic Resources. The SUMC Project, in combination with other past, current, and probable future development in the City, would cause a substantial change in the significance of the City's historic resources and thus have a significant cumulative impact. The SUMC Project's contribution to the cumulative impact would be cumulatively considerable.	S	MITIGATION MEASURES. Due to the demolition of the Stone Building complex, the SUMC Project's contribution would remain cumulatively considerable as this impact cannot be avoided. Implementation of Mitigation Measures CR-1.2 through CR-1.4 would reduce the SUMC Project's contribution to the cumulative impact, but not to a less than cumulatively considerable level.	SU
CR-6. Cumulative Impacts on Prehistoric and/or Archaeological Resources and Human Remains. The SUMC Project, in combination with other reasonably foreseeable probable future development, could cause a substantial change in the significance of prehistoric and/or archaeological resources or human remains and thus contribute to a significant cumulative impact. The SUMC Project is conservatively assumed to have a considerable contribution.	S	MITIGATION MEASURES. Compliance with Mitigation Measures CR-2.1 and CR-3.1 would reduce the SUMC Project's contribution to the cumulative impact to a less than cumulatively considerable level.	LTS
CR-7. Cumulative Impacts on Paleontological Resources. The SUMC Project, in combination with other reasonably foreseeable probable future development where the Pleistocene-age creek bed may occur, could have a significant cumulative impact. Such an impact would occur if the buried Pleistocene-age creek bed is exposed in lengths greater than approximately 100 feet (or a sufficient length to support detailed hydrological study) and if such deposits contain substantially intact skeletons of extinct species. These conditions would represent a major find for regional paleontology. In the case that significant paleontological finds—such as stretches of buried Pleistocene-age creek bed greater than 100 feet in length and containing intact skeletons of extinct species—are made on the SUMC Site, then the	S	MITIGATION MEASURE. Compliance with Mitigation Measure CR-4.1 would reduce the SUMC Project's contribution to the cumulative impact to a less than cumulatively considerable level.	LTS

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
SUMC Project's contribution to the cumulative impact on paleontological resources could be cumulatively considerable.			
3.9 Biological Resources			
BR-1. Impacts on Special-Status Plant or Wildlife Resources. The SUMC Project could have a significant impact on special-status wildlife resources.	S	MITIGATION MEASURES. Mitigation Measures BR-1.1 through BR-1.5, below, to be implemented by the SUMC Project sponsors, would reduce the SUMC Project's impact on special-status bats and Cooper's hawk to a less-than-significant level. *BR-1.1* *Conduct Pre-Demolition Survey*. The SUMC Project sponsors shall retain a qualified biologist ("bat biologist") to conduct a pre-construction survey for roosting bats in trees to be removed or pruned and structures to be removed. If no roosting bats are found, no further mitigation is required. If a bat roost is found, the SUMC Project sponsors shall implement the following measures to avoid impacts on roosting bats. *BR-1.2* *Avoid Roosting Areas*. If non-breeding bats are found in a tree or structure to be removed, the individuals shall be safely evicted, under the direction of a qualified bat biologist, by opening the roosting area to allow airflow through the cavity. Demolition should then follow at least one night after initial disturbance for airflow. This action should allow bats to leave during darkness, thus increasing their chance of finding new roosts with a minimum of potential predation during daylight. If active maternity roosts are found in structures that will be removed as part of project construction, demolition of that structure shall commence before maternity colonies form (generally before March 1) or after young are flying (generally by July 31).	LTS

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		BR-1.3 *Develop and Employ Bat Nest Box Plan*. If special-status bats are found in structures to be removed, the SUMC Project sponsors shall develop a bat nest box plan for the SUMC Sites employing state-of-the-art bat nest box technology. The design and placement of nest boxes shall be reviewed by a qualified bat biologist.	
		BR-1.4 *Avoid Tree Removal During Nesting Season*. Tree removal or pruning shall be avoided from February 1 through August 31, the nesting period for Cooper's hawk, to the extent feasible. If no tree removal or pruning is proposed during the nesting period, no surveys are required.	
		BR-1.5 *Protect Cooper's Hawk in the Event of Nest Discovery*. If tree removal or pruning is unavoidable during the nesting season, the SUMC Project sponsors shall hire a qualified biologist to conduct a survey for nesting Cooper's hawk within five days prior to the proposed start of construction. If active Cooper's hawk nests are not present, project activities can take place as scheduled. The qualified biologist shall visit the site daily to search for nests until all nesting substrates are removed. This will avoid impacts to Cooper's hawk that may have moved into the site and initiated nest-building after the start of tree removal activities. Additionally, if more than 5 days elapses between the initial nest search and the tree removal, it is possible for new birds to move into the construction area and begin building a nest. If there is such a delay, another nest survey shall be conducted. If any active Cooper's hawk nests are detected, the SUMC Project sponsors shall delay removal of the applicable tree or shrub while the nest is occupied with eggs or young who have not fledged. A qualified biologist shall monitor any occupied nest to determine when the Cooper's hawk nest is no longer used.	

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
BR-2. Loss of Riparian or Other Sensitive Habitats, Including Wetlands as Defined by Section 404 of the Clean Water Act. Construction of the SUMC Project would have a less-than-significant impact on riparian or other sensitive habitat resources, including wetlands.	LTS	None required.	N/A
BR-3. Interference with the Movement of Any Native Resident or Migratory Fish or Wildlife Species or with Established Native Resident or Migratory Wildlife Corridors, or Use of Native Wildlife Nursery Sites. The SUMC Project would have no impact on the movement of any native resident or migratory fish or wildlife species, or use of native resident or migratory wildlife corridors, but could impede the use of native wildlife nursery sites and thus result in a significant impact.	S	MITIGATION MEASURES. Mitigation Measures BR-3.1 and BR-3.2, below, would reduce the SUMC Project's impact on nesting migratory birds to a less-than-significant level. *BR-3.1* *Avoid Tree Removal During Nesting Season*. Tree or shrub removal or pruning shall be avoided from February 1 through August 31, the bird-nesting period, to the extent feasible. If no tree or shrub removal or pruning is proposed during the nesting period, no surveys are required. *BR-3.2* *Protect Birds in the Event of Nest Discovery*. If tree and shrub removal or pruning is unavoidable during the nesting season, the SUMC Project sponsors shall hire a qualified biologist to conduct a survey for nesting raptors and other birds within five days prior to the proposed start of construction. If active nests are not present, SUMC Project activities can take place as scheduled. The qualified biologist shall visit the site daily to search for nests until all nesting substrates are removed. These procedures would avoid impacts to any birds that may have moved into the sites and initiated nest-building after the start of tree and shrub removal activities. Additionally, if more than five days elapses between the initial nest search and the vegetation removal, it is possible for new birds to move into the construction area and begin building a nest. If there is such a delay, another nest survey shall be conducted. If any active nests are detected, the SUMC Project sponsors shall delay removal of the applicable	LTS

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		tree or shrub while the nest is occupied with eggs or young who have not fledged. A qualified biologist shall monitor any occupied nest to determine when the nest is no longer used.	
BR-4. Result in a Substantial Adverse Effect on any Protected Tree as Defined by the City of Palo Alto's Tree Preservation Ordinance (Municipal Code Section 8.10). The SUMC Project could have a significant impact on Protected Trees.	S	MITIGATION MEASURES. Mitigation Measures BR-4.1 through BR-4.5, below, to be implemented by the SUMC Project sponsors, would reduce the SUMC Project's impact on Protected Trees. In addition, Mitigation Measure BR-4.6 would require minor SUMC Project site plan adjustments to avoid removal of some biologically and aesthetically significant Protected Trees. However, the new Hospital District under the SUMC Project would allow the removal of up to 48 Protected Trees that are protected under the Municipal Code. In addition, minor modifications to the SUMC Project site plans would not be able to avoid the nine biologically and aesthetically significant Protected Trees in the Kaplan Lawn area. Therefore, the SUMC Project would result in a significant and unavoidable impact to Protected Trees.	SU
		BR-4.1 *Prepare a Tree Preservation Report for all Trees to be Retained.* An updated tree survey and tree preservation report (TPR) prepared by a certified arborist shall be submitted for review and acceptance by the City Urban Forester. For reference clarity, the tree survey shall include (list and field tag) all existing trees within the SUMC Sites, including adjacent trees overhanging the SUMC Sites. The approved TPR shall be implemented in full, including mandatory inspections and monthly reporting to City Urban Forester. The TPR shall be based on latest SUMC plans and amended as needed to address activity or within the dripline area of any existing tree to be preserved, including incidental work (utilities trenching, street work, lighting, irrigation, etc.) that may affect the health of a preserved tree. The SUMC Project shall be modified to address recommendations identified to reduce impacts to existing ordinance-regulated trees. The	

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SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		TPR shall be consistent with the criteria set forth in the Tree Preservation Ordinance, Palo Alto Municipal Code Section 8.10.030, and the City Tree Technical Manual, Section 3.00, 4.00 and 6.30.[25] To avoid improvements that may be detrimental to the health of regulated trees, the TPR shall review the SUMC Project sponsors' landscape plan to ensure the new landscape is consistent with Tree Technical Manual, Section 5.45 and Appendix L, Landscaping under Native Oaks.	
		BR-4.2 *Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks*. The SUMC Project sponsors shall prepare a SAS of Short and Long Term Effects on Protected Oaks. The SAS shall be prepared by a qualified expert team (horticulturalist, architect designer, consulting arborist) capable of determining effects, if any, to foliage, health, disease susceptibility and also prognosis for longevity. The SAS shall provide alternative massing scenarios to provide sufficient solar access and reduce shading detriment at different thresholds of tree health/decline, as provided for in the SAS. The SAS adequacy shall be subject to peer review as determined necessary by the City. The SAS design alternatives shall be the subject of specific discussion at all levels of ARB, Planning Commission, City Council, and public review in conjunction with the SUMC Project sponsors, the City Urban Forester, and Director of the Planning and Community Environment Department, until a final design is approved.	

[25] Palo Alto Municipal Code Section 8.10.030 and the City Tree Technical Manual, Section 3.00, 4.00 and 6.30 is available at: http://www.cityofpaloalto.org/environment/urban_canopy.asp.

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		BR-4.3 *Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention.* Because of inherent mortality associated with the process of moving mature trees, a Tree Relocation and Maintenance Plan (TRMP) shall be prepared subject to Urban Forester's approval. The SUMC Project sponsors shall submit a TRMP to determine the feasibility of moving the Protected Trees to an appropriate location on site. Feasibility shall consider current site and tree conditions, a tree's ability to tolerate moving, relocation measures, optimum needs for the new location, aftercare, irrigation, and other long-term needs. If the relocated trees do not survive after a period of five years, the tree canopy shall be replaced with a tree of equivalent size or security deposit value. The TRMP shall be inclusive of the following minimum information: appropriate irrigation, monitoring inspections, post relocation tree maintenance, and for an annual arborist report of the condition of the relocated trees. If a tree is disfigured, leaning with supports needed, in decline with a dead top or dieback of more than 25 percent, the tree shall be considered a total loss and replaced in kind and size. The final annual arborist report shall serve as the basis for return of the Tree Security Deposit (see Mitigation Measure BR-4.4, below, for a discussion of the Tree Security Deposit).	
		BR-4.4 *Provide a Tree Preservation Bond/Security Guarantee.* The natural tree resources on the SUMC Site include significant Protected Trees and those that provide neighborhood screening, including two trees proposed for relocation. Prior to building permit submittal, the Tree Security Deposit for the total value of the relocated trees, as referenced in the Tree Technical Manual, Section 3.26, Security Deposits, shall be posted to the City	

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		Revenue Collections in a form acceptable by the City Attorney. As a security measure, the SUMC Project sponsors shall be subject to a Memorandum of Understanding (MOU) between the City of Palo Alto and the SUMC Project sponsors describing a tree retention amount, list of trees, criteria and timeline for return of security, and conditions as cited in the Record of Land Use Action for the SUMC Project. The SUMC Project sponsors and SUMC Project arborist, to be retained by the SUMC Project sponsors, shall coordinate with the City Urban Forester to determine the amount of bonding required to guarantee the protection and/or replacement of the regulated trees on the site during construction and within five years after occupancy. The SUMC Project sponsors shall bond for 150 percent of the value for the relocated trees, and 50 percent of the value of the remaining trees to be protected during construction (as identified in the revised and final approved Tree Protection Report). The SUMC Project sponsors shall provide an appraisal of the trees with the proposed level of bonding in a tree value table to be reviewed and accepted by the Director of Planning and Community Environment with the description of each tree by number, value, and total combined value of all the trees to be retained. A return of the guarantee shall be subject to an annual followed by a final tree assessment report on all the relocated and retained trees from the SUMC Project arborist, as approved by the City Urban Forester, five years following final inspection for occupancy, to the satisfaction of the Director of the Planning and Community Environment Department.	
		BR-4.5 *Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category*. There are many publicly owned trees growing in the right-of-way along various frontages (Welch Road, Pasteur Drive, Quarry Road, Sand Hill Road, etc.).	

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SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		These trees provide an important visual and aesthetic value to the streetscape and represent a significant investment from years of public resources to maintain them. As mitigation to offset the net benefits loss from removal of mature trees, and to minimize the future years to achieve parity with visual and infrastructure service benefits (CO_2 reduction, extended asphalt life, water runoff management, etc.) currently provided by the trees, the new public trees on all roadway frontages shall be provided with best practices design and materials, including, but not limited to, the following elements: • Consistency with the City of Palo Alto Public Works Department Street Tree Management Plan, in consultation with Canopy, Inc.[26] • Provide adequate room for natural tree canopy growth and adequate root growing volume. For large trees, a target goal of 1,200 cubic feet of soil shall be used. • For pedestrian and roadway areas that are to include tree planting or adjacent to existing trees to be retained, utilize City-approved best management practices for sustainability products, such as permeable ADA sidewalk surfaces, Silva Cell base support planters, engineered soil mix base, and other advantage methods.	

[26] Canopy, Inc. is a non-profit organization that advises the City with regards to public trees. The City typically interfaces between applicants and the Canopy, Inc., but it is recommended that the SUMC Project sponsors consult with Canopy, Inc. as well.

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		BR-4.6 *Implement Minor Site Modifications to Preserve Biologically and Aesthetically Significant Protected Trees*. The SUMC Project sponsors shall design and implement modifications to building design, hardscape, and landscape to incorporate the below and above ground area needed to preserve as many biologically and aesthetically significant Protected Trees as possible.	
BR-5. Conflict with any Applicable Habitat Conservation Plan or Natural Community Conservation Plan. The SUMC Project would have no impact on any applicable Habitat Conservation Plan or Natural Community Conservation Plan.	NI	None required.	N/A
BR-6. Cumulative Impacts on Special-Status Wildlife Resources. The SUMC Project, in combination with other foreseeable development, would have a less-than-significant impact on Special-Status Plant Resources.	LTS	None required.	N/A
BR-7. Cumulative Loss of Riparian or Other Sensitive Habitats, Including Wetlands as Defined by Section 404 of the Clean Water Act. Cumulative impacts on riparian or other sensitive habitats could be significant. However, the SUMC Project's contribution to the cumulative impact would be less than cumulatively considerable.	LTS	None required.	N/A
BR-8. Cumulative Interference with the Movement of Any Native Resident or Migratory Fish or Wildlife Species or With Established Native Resident or Migratory Wildlife Corridors, or Use of Native Wildlife Nursery Sites. Cumulative interference with movement of resident or migratory species or with established migratory corridors could be significant. However, the SUMC Project's contribution to the cumulative impact would be less than cumulatively considerable.	LTS	None required.	N/A

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BR-9. Cumulative Impacts on Protected Tree as defined by the City of Palo Alto's Tree Preservation Ordinance (Municipal Code Section 8.10). Cumulative impacts on Protected Trees would be significant. Because the SUMC Project would result in the loss of Protected Trees, the SUMC Project's contribution would cumulatively considerable.	S	MITIGATION MEASURES. Mitigation Measures BR-4.1 through BR-4.6 would reduce the SUMC Project's contribution to cumulative impacts on Protected Trees. However, removal of some Protected Trees, including those identified by the City as being biologically and aesthetically significant Protected Trees, would be unavoidable. As such, the contribution of the SUMC Project to cumulative Protected Tree removal would remain cumulatively considerable.	SU
3.10 Geology			
GS 1. Exposure to Seismic-Related Hazards. The SUMC Project would have a less-than-significant potential to expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic groundshaking, seismic-related ground failure (including liquefaction), landslides, expansive soil, or major geologic hazards that cannot be mitigated through the use of standard engineering design and seismic safety techniques.	LTS	None required.	N/A
GS 2. Exposure to Other Geotechnical Hazards. The SUMC Project would have a less-than-significant potential to be located on geologic units or on soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.	LTS	None required.	N/A
GS 3. Cause Substantial Erosion or Siltation. The SUMC Project would have a less-than-significant potential to cause substantial erosion or siltation.	LTS	None required.	N/A

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Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
GS-4. Cumulative Exposure to Substantial Erosion or Siltation. The SUMC Project, in combination with other foreseeable development in the San Francisquito Creek Watershed, would not substantially increase erosion or siltation because of State, federal, and local runoff and erosion prevention requirements. As a result, the cumulative impact would be less than significant.	LTS	None required.	N/A
3.11 Hydrology			
HW-1. Flood Risk and Flood Flows. The SUMC Project would have no impact on flood risk or flood flows.	NI	None required.	N/A
HW-2. Groundwater Recharge and Local Water Table. The SUMC Project would have a less-than-significant impact on groundwater recharge and the local groundwater table level.	LTS	None required.	N/A
HW-3. Groundwater Quality. The SUMC Project could have a significant impact on groundwater quality during construction.	S	MITIGATION MEASURE. Mitigation Measure HW-3.1, below, would reduce the SUMC Project's impact on groundwater quality to a less-than-significant level. *HW-3.1 Develop a Work Plan for any Unknown Contaminated Sites.* During construction, if suspected contaminated soil, undocumented underground tanks, hazardous materials pipelines, or other evidence of potential hazardous materials are discovered, construction activities shall cease and the SUMC Project sponsors shall prepare a workplan to determine the potential risk to human and ecological health. The workplan shall be prepared by a Registered Environmental Assessor and in compliance with the Department of Toxic Substances Control (DTSC) guidelines and the National Oil and Hazardous	LTS

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		Substances Contingency Plan (the "National Contingency Plan" [NCP]). The SUMC Project sponsors, or their representative, shall be responsible for submitting the workplan for the DTSC's review and approval prior to implementing field activities. The workplan must include all information necessary for implementing field work. The workplan shall include a Site Safety Plan (SSP) and a Sampling Work Plan (SWP). The SSP must be submitted to the DTSC in conjunction with the submittal of the SWP. The objective of the SSP is to ensure protection of the investigative team as well as the general public during sampling activities. If risk to human or ecological health is identified, the SUMC Project sponsors shall prepare and implement a Removal Action Workplan (SB 1706 Stats. 1994, Chapter 441) (non-emergency removal action or remedial action at a hazardous substance release site which is projected to cost less than $1,000,000) that is consistent with the NCP.	
HW-4. Stormwater Runoff and Erosion. The SUMC Project would have a less-than-significant impact on stormwater runoff and erosion.	LTS	None required.	N/A
HW-5. Flooding and Stormwater Conveyance Capacity. The SUMC Project would have a less-than-significant impact on flooding and stormwater conveyance capacity.	LTS	None required.	N/A
HW-6. Streambank Instability. The SUMC Project would have a less-than-significant impact on streambank instability.	LTS	None required.	N/A

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HW-7. Degradation of Surface Water Quality. The SUMC Project would have a less-than-significant impact on degradation of surface water quality.	LTS	None required.	N/A
HW-8. Dam Failure Inundation. The SUMC Project would have a less-than-significant impact regarding dam failure inundation.	LTS	None required.	N/A
HW-9. Violation of Any Water Quality Standards or Waste Discharge Requirements (WDRs). The SUMC Project would have a less-than-significant impact regarding water quality standards or WDRs.	LTS	None required.	N/A
HW-10. Cumulative Groundwater Recharge and Local Water Table. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative considerable impact on groundwater recharge and the local groundwater table.	LTS	None required.	N/A
HW-11. Cumulative Groundwater Quality Impacts. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative impact on groundwater quality.	LTS	None required.	N/A
HW-12. Cumulative Stormwater Runoff and Erosion. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative impact on stormwater runoff and erosion.	LTS	None required.	N/A

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
HW-13. Cumulative Flooding and Stormwater Conveyance. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative impact on stormwater runoff and erosion.	LTS	None required.	N/A
HW-14. Streambank Instability. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative impact on streambank instability.	LTS	None required.	N/A
HW-15. Degradation of Surface Water Quality. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative impact on degradation of surface water quality.	LTS	None required.	N/A
HW-16. Dam Failure Inundation. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative impact regarding dam failure inundation.	LTS	None required.	N/A
HW-17. Violation of Any Water Quality Standards or Waste Discharge Requirements (WDRs). The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative impact on violation of water quality standards and WDRs.	LTS	None required.	N/A

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
3.12 Hazardous Materials			
HM-1. Exposure from Hazardous Materials Use, Handling, and Disposal. The SUMC Project would not substantially increase exposure from hazardous materials use, handling, and disposal during operation.	LTS	None required.	N/A
HM-2. Demolition and Construction-Related Hazardous Materials Disturbance. The SUMC Project could release hazardous materials in existing buildings.	S	MITIGATION MEASURE. Implementation of the mitigation measure below would reduce impacts from exposure to asbestos containing materials to a less-than-significant level at the SUMC Sites by ensuring that all asbestos containing materials are identified and removed prior to structural modification and/or demolition. *HM-2.1* *Conduct Asbestos Survey at the SUMC Sites*. Prior to building renovation and/or demolition, an asbestos survey shall be performed on all areas of the building anticipated to be demolished and/or renovated. This survey shall be performed by a licensed asbestos abatement contractor. In the event that asbestos is identified in the buildings proposed to be demolished and/or renovated, all asbestos containing materials shall be removed and appropriately disposed of by a licensed asbestos abatement contractor. A site health and safety plan, to ensure worker safety, in compliance with OSHA requirements (8 CCR 5208) shall be developed by the SUMC Project sponsors and in place prior to commencing renovation or demolition work on portions of buildings containing asbestos.	LTS

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Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
HM-3. Exposure to Contaminated Soil and/or Groundwater During Construction. The SUMC Project could expose construction personnel and public to existing contaminated groundwater and/or soil.	S	MITIGATION MEASURES. With implementation of Mitigation Measure HM-3.1 through HM-3.4, below, the significant impact on construction personnel and the public due to exposure to contaminated soil and/or groundwater at the SUMC Sites would be reduced to less-than-significant levels. In addition, Mitigation Measure HW-3.1 in Section 3.11, Hydrology, would require the SUMC Project sponsors to develop a work plan for any unknown contaminated site, which would further reduce the impacts to less than significant. Mitigation Measure HM-3.4 would require specification of measures to prevent hazards from any remediation itself. As such, these would be less-than-significant impacts from any remediation. *HM-3.1* *Perform a Phase II ESA for the 701 Welch Site*. A Phase II ESA shall be performed at 701 Welsh Site Building B. The Phase II ESA shall include sampling and analysis of soil, groundwater, wastewater, and residues on surfaces such as laboratories countertops, fume hoods, sinks, sumps, floors, and drain lines. The County DEH and PAFD shall be notified by the Project sponsors if contamination is discovered. If contamination is discovered, the SUMC Project sponsors shall prepare a site remediation assessment that (a) specifies measures to protect workers and the public from exposure to potential site hazards and (b) certifies that the proposed remediation measures would clean up contaminants, dispose of the wastes, and protect public health in accordance with federal, State, and local requirements. Site excavation activities shall not proceed until the site remediation has been approved by the County DEH and implemented by the SUMC Project sponsors. Additionally, the Site Remediation Assessment shall be subject to review and approval by the San Francisco Bay RWQCB. All appropriate agencies shall be notified.	LTS

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Table S-4
SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		HM-3.2 Excavate Contaminated Soil from the 703 Welch Site. For the 4- to 9-square-foot area near every discharge point from the building, soil samples shall be performed and contaminated soil excavated, removed, and transported to an approved disposal facility in compliance with OSHA requirements. The County DEH and the PAFD shall be notified by the SUMC Project sponsors if contamination is encountered during construction.	
		HM-3.3 Conduct a Soil Vapor Program at the Hoover Pavilion Site. A qualified consultant, under the SUMC Project sponsors' direction, shall undertake the following activities: • Remove all buried underground storage tanks from the property after sheds and storage buildings on the Hoover Pavilion Site have been demolished; • To the extent necessary, additional soil sampling shall be collected to determine health risks and to develop disposal criteria; • If warranted based on soil sampling, a human health risk assessment shall be prepared and implemented to determine potential for impacts on construction workers as well as to develop measures to ensure it is safe to redevelop the Hoover Pavilion Site within engineering controls (e.g., SVE or vapor barriers); and • To the extent required based upon the results of soil sampling and the results of a health risk assessment (if applicable), a Site Health and Safety Plan to ensure worker safety in compliance with OSHA requirements shall be developed by the Project sponsors, and in places prior to commencing work on any contaminated site.	

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SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		The SUMC Project sponsors shall cooperate with the County DEH to proceed with closure of the Hoover Pavilion Site.	
		HM-3.4 Develop a Site Management Plan for the Hoover Pavilion Site. The SUMC Project sponsors shall prepare a site remediation assessment that (a) specifies measures to protect workers and the public from exposure to potential site hazards, including hazards from remediation itself, and (b) certifies that the proposed remediation measures would clean up contaminants, dispose of the wastes, and protect public health in accordance with federal, State, and local requirements. Site excavation activities shall not proceed until the site remediation has been approved by the County DEH and implemented by the SUMC Project sponsors. Additionally, the Site Remediation Assessment shall be subject to review and approval by the San Francisco Bay RWQCB. All appropriate agencies shall be notified.	
HM-4. Hazardous Waste Generation and Disposal Resulting in Increased Exposure Risk. The SUMC Project would not substantially increase exposure risk related to hazardous waste generation.	LTS	None required.	N/A
HM-5. Emit Hazardous Emissions or Handle Hazardous Materials Within One-Quarter Mile of a School. The SUMC Project would not emit or handle hazardous materials within one-quarter mile of school.	LTS	None required.	N/A
HM-6. Construct a School on a Property that is Subject to Hazards from Hazardous Materials Contamination, Emissions or Accidental Release. The SUMC Project would not construct a school that is subject to hazards from hazardous materials contamination, emissions or accidental release.	NI	None required.	N/A

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SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
HM-7. Occur on a Site Included on the Cortese List, a List of Hazardous Materials Sites. The SUMC Project would result in construction of facilities on a site included on the Cortese List.	S	MITIGATION MEASURES. Implementation of Mitigation Measures HM-3.3 and HM-3.4, which involve the implementation of a soil vapor program and development of a site management plan, would reduce the potential for exposure to hazardous materials at the Hoover Pavilion Site to less-than-significant levels. Additionally, compliance with current federal, State and local regulations would help prevent any further exposure to hazardous materials.	LTS
HM-8. Wildland Fire Risk. The SUMC Project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires.	NI	None required.	N/A
HM-9. Occur on a Site Located Within an Airport Land Use Plan or Within Two Miles of a Public Airport, and Result in a Safety Hazard. The SUMC Project would not be located within an Airport Land Use Plan or within 2 miles of a Public Airport.	NI	None required.	N/A
HM-10. Impairment of Emergency Plans. The SUMC Project could impair implementation or physically interfere with an adopted emergency response or evacuation plan.	S	MITIGATION MEASURES. Mitigation Measure HM-10.1 requires advance coordination with the City of Palo Alto on construction routes or roadway closures. This measure, together with Mitigation Measures TR-1.1, TR-1.4 through TR-1.6, and TR-1.8, which all involve construction-period traffic controls, would reduce the significant construction-period impacts to a less-than-significant level. Mitigation Measure TR-9.1, would involve the installation of emergency vehicle traffic signal priority (OptiCom) at all intersections significantly impacted by the SUMC Project. Mitigation Measure TR-9.1 would reduce impacts on emergency access during operation. Implementation of these measures would reduce the SUMC Project's impact to emergency evacuation and response plans to a less-than-significant level.	LTS

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SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		HM-10.1 Coordinate Construction Activities with the City of Palo Alto. The SUMC Project sponsors shall provide to the City planned construction routes, roadway closures, and access and closures schedules. This information shall be provided to the City at least two weeks in advance of the planned access and closures. The City shall coordinate this information among affected emergency service providers, including the City's Fire and Police Departments, and private ambulance services, so that alternative routes could be planned and announced prior to the scheduled access and closures, as deemed necessary by the City.	
HM-11. Cumulative Handling, Storage, Disposal, and Transport of Hazardous Materials. Cumulative development would increase handling, storage, disposal, and transport within the SUMC Sites and adjacent areas. However, cumulative development would be subject to applicable federal, State, and local regulations that would govern these activities. As a result, the cumulative impact would be less than significant.	LTS	None required.	N/A
HM-12. Cumulative Disturbance of Hazardous Materials from Construction. The SUMC Project and adjacent development could result in cumulative release of hazardous materials during construction, a significant cumulative impact. The SUMC Project's contribution to the cumulative impact would be considerable.	S	MITIGATION MEASURE. Mitigation Measure HM-2.1, involving measures to reduce exposure of persons to hazardous materials (such as asbestos), would reduce the SUMC Project's contribution to a less-than-significant level	LTS
HM-13. Cumulative Exposure to Contaminated Soil and/or Groundwater, and from Cortese List Sites. The SUMC Project and adjacent development could result in cumulative disturbance of contaminated soils, release of hazardous materials during construction, a significant cumulative impact.	S	MITIGATION MEASURES. Mitigation Measure HM-3.2, which involves remediation of known site contamination at the 703 Welch Road site, would reduce the SUMC Project's contribution to the cumulative impact to less than considerable. Also, Mitigation Measures HM-3.1, HM-3.3, and HM-3.4, involving investigations at other SUMC areas and preparation of the	LTS

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SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
The SUMC Project's contribution to the cumulative impact would be considerable.		Site Management Plan for remediation activities, would further ensure that any other risks associated with the SUMC Project would be less than cumulatively considerable.	
HM-14. Cumulative Exposure of Schools to Hazardous Materials and Waste. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less than cumulatively considerable impact on exposure of schools to hazardous materials.	LTS	None required.	N/A
HM-15. Cumulative Impairment of Emergency Plans. Cumulative development could impair implementation or physically interfere with an adopted emergency response or evacuation plan. The SUMC Project's contribution to the cumulative impact would be considerable.	S	MITIGATION MEASURES. Mitigation Measures HM-10.1, above, and TR-1.1, TR-1.4 through TR-1.6, and TR-1.8 would reduce the SUMC Project's contribution to cumulative impacts on emergency evacuation and response plans to less than cumulatively considerable.	LTS
3.13 Population and Housing			
PH-1. Population Growth. The SUMC Project would increase on-site employment and visitors and thus indirectly induce housing demand and population growth; however, the percentage of regional housing demand resulting from the SUMC Project would be relatively small in comparison with projected housing growth in the region, and would comprise a less-than-significant environmental impact.	LTS	None required.	N/A
PH-2. Displacement of Existing Housing or Residents. The SUMC Project would not displace existing housing or residents because the SUMC Project would involve infill of currently developed sites that do not contain housing. Thus, the SUMC Project would result in no impact with respect to displacement of housing or residents.	NI	None required.	N/A

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SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
PH-3. Impacts on Jobs to Employed Residents Ratio. The SUMC Project would have an adverse impact on the City's jobs to employed residents ratio because it would exceed the existing Comprehensive Plan and zoning allowances for the SUMC Sites and thus require amendment to the Comprehensive Plan and rezoning, and it would increase the City's jobs to employed residents ratio by more than 0.01. However, this impact is not, itself, an environmental impact. This impact will result in secondary environmental impacts relating to additional commute traffic, including the significant and unavoidable impacts on air quality and climate change, as identified in Sections 3.5 and 3.6. The present analysis of impacts to the "jobs to employed residents" ratio is presented for informational purposes, and for the purpose of identifying additional mitigation measures for those identified impacts.	N/A	MITIGATION MEASURE. Implementation of Mitigation Measure PH-3.1 would reduce the impact on the City's jobs to employed residents ratio; however, such implementation would not fully avoid the SUMC Project's impact on the jobs to employed residents ratio because (1) the measures would not guarantee provision of housing units to cover the demand from the 1,052 households (or 8 percent thereof), and (2) due to the various factors that people consider in choosing where to live, it cannot be ascertained that the 1,810 workers would choose to live in Palo Alto. Due to the high concentration of jobs in Palo Alto, it is possible that a strong affordable housing program would result in reduced traffic congestion, vehicle miles traveled, and greenhouse gas emissions. Implementation of Mitigation Measure PH-3.1 is not directly required in order to mitigate a significant environmental impact, but rather should be considered as possible additional mitigation for Impacts AQ-2, AQ-7, CC-1, and CC-2, as discussed in Section 3.5, Air Quality, and Section 3.6, Climate Change, of this EIR. However, it should be stressed that these measures are presented here only in conceptual terms, and the City may find that some or all of them are not feasible for various legal, practical, or other reasons. As such, Mitigation Measure PH-3.1 is presented for informational purposes, and to ensure that all possible options for mitigation of these impacts are adequately considered. *PH-3.1* *Reduce the Impacts on the Jobs to Employed Residents Ratio*. In order to reduce the SUMC Project's impacts on the City's jobs to employed residents ratio, one or more of the following measures shall be implemented by both the City and the SUMC Project sponsors: • The City shall explore amending the Zoning Code to permit more residential uses, particularly multifamily residential use;	N/A

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SUMC Project Summary of Impacts and Mitigation Measures

Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
		• The SUMC Project sponsors shall ensure that a specified number of housing units in the County shall be dedicated to SUMC employees; • The City shall amend the Zoning Code to remove the hospital exemption from payment of the affordable housing fee; • The City shall impose an additional ad hoc housing fee on development to ensure development of required affordable housing. The amount of the fee shall be based on the cost of the additional affordable housing units induced by the SUMC Project as well as the cost of the General Fund subsidy contribution to the existing housing impact fee; and/or • The City shall provide an inclusionary housing requirement in the newly created Hospital District. The requirement shall provide a number of options for development of additional housing with an emphasis on affordable housing.	
3.14 Public Services			
PS-1. Impacts Related to Fire Protection and Emergency Medical Facilities. The SUMC Project would require an increased level of fire and emergency services. However, the increased level of fire and emergency services would not be large enough to trigger the need for construction of new facilities, which could adversely affect the physical environment. Impacts would be less than significant.	LTS	None required.	N/A

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Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
PS-2. Impacts from Police Protection Facilities. The SUMC Project would require an increased level of police services. However, the increased level of police services would not be large enough to trigger the need for construction of new facilities, which could adversely affect the physical environment. Impacts would be less than significant.	LTS	None required.	N/A
PS-3. Impacts Related to School Facilities. An increase in students, which would require school expansions, would result as a tertiary impact of the SUMC Project, since increased employment from the SUMC Project could induce additional housing units within the City. Both the SUMC Project and induced housing projects would be subject to SB 50 School Impact Fees, which would mitigate impacts to less than significant.	LTS	None required.	N/A
PS-4. Impacts Related to Construction of New or Altered Parks and Recreation Facilities. The SUMC Project would not result in the construction or expansion of new parks or fields, which would in turn result in adverse environmental impacts. The SUMC Project would be required to pay a City Community Facility Fee, which would be used to fund new parks or an alteration to an existing park, and would mitigate impacts to less than significant.	LTS	None required.	N/A
PS-5. Deterioration of Park and Recreation Facilities. Increased recreational demand from SUMC Project employees could accelerate the physical deterioration of the City's parks and fields. The SUMC Project would be required to pay a City Community Facility Fee, which reduce or avoid any such deterioration, and would mitigate impacts to less than significant.	LTS	None required.	N/A

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Impacts	Impact Significance Without Mitigation	Mitigation Measures	Impact Significance With Mitigation
PS-6. Cumulative Fire Protection Demand and Emergency Medical Facilities. Cumulative growth would increase demand for fire protection and emergency response services within the PAFD's service area; however, no new PAFD facilities would need to be constructed. Cumulative impacts would be less than significant.	LTS	None required.	N/A
PS-7. Cumulative Police Protection Demand. Cumulative growth in the City could necessitate construction of new or expanded police facilities in order to meet increased demand for services. Construction of new or expanded police facilities could result in significant environmental impacts. As such, cumulative impacts related to police service could be significant. However the SUMC Project's contribution to the cumulative need for new or expanded police facilities would be less than cumulatively considerable.	LTS	None required.	N/A
PS-8. Cumulative School Demand. Cumulative development in the City can be expected to necessitate expansion of school facilities, which could have adverse physical environmental impacts. This cumulative impact is conservatively assumed to be significant, although the SUMC Project's contribution to this cumulative impact would be less than cumulatively considerable.	LTS	None required.	N/A
PS-9 Cumulative Demand for Parks and Recreation Facilities, and for New Parks. Cumulative impacts related to park deterioration would be less than significant due to the City's Community Facility Fee. Cumulative growth in the City would necessitate acquisition or development of new parklands, which could result in significant environmental impacts; however, the contribution of the SUMC Project to	LTS	None required.	N/A

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this cumulative impact would be less than cumulatively considerable.			
3.15 Utilities			
UT-1. Water Demand. The SUMC Project would result in a less-than-significant water supply impact because it would not result in the need for new or expanded entitlements for water supplies, and would not require expansion or construction of water facilities.	LTS	None required.	N/A
UT-2. Wastewater Generation. The SUMC Project would result in a less-than-significant wastewater impact because it would not exceed treatment requirements of the RWQCB, would not significantly increase use of the wastewater disposal system, and would not require expansion or construction of wastewater collection or treatment facilities.	LTS	None required.	N/A
UT-3. Stormwater Generation. The SUMC Project would have a less-than-significant impact related to stormwater collection system capacity because it would not significantly increase use of the stormwater collection system, and would not require expansion or construction of new stormwater facilities.	LTS	None required.	N/A
UT-4. Solid Waste Generation. The SUMC Project would result in a less-than-significant solid waste impact because it would be served by landfills with sufficient capacity and, thus, would not contribute to the need to expand existing or construct new solid waste disposal facilities.	LTS	None required.	N/A

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UT-5. Energy Demand. Although the SUMC Project is an urban infill project and would not require the expansion of natural gas facilities and would use existing utility facilities, it may require the installation of near-site electrical facilities and natural gas pipelines to accommodate the projected additional demand. However, this installation is included in the SUMC Project and no additional off-site construction relating to electrical and natural gas facilities would occur. Therefore, the SUMC Project would have a less-than-significant impact related to the construction of energy facilities.	LTS	None required.	N/A
UT-6. Cumulative Water Impacts. Since the City has sufficient water supply to accommodate water demands for cumulative development up to 2025, new or expanded entitlements for water supplies are not necessary. Therefore, cumulative development would have a less-than-significant cumulative impact related to water supply.	LTS	None required.	N/A
UT-7. Cumulative Wastewater Impacts. Since the RWQCP has sufficient capacity to accommodate wastewater generated by cumulative development up to 2025, implementation of major facility and infrastructure improvements would not be necessary. In addition, general replacement and maintenance of old wastewater facilities is expected and would comply with applicable environmental regulations. Therefore, cumulative development would not have a significant cumulative impact related to wastewater.	LTS	None required.	N/A
UT-8. Cumulative Stormwater Generation. Cumulative development in the City of Palo Alto and at Stanford University could increase the amount of stormwater runoff. This increased level of runoff may trigger the need for the	LTS	None required.	N/A

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replacement or maintenance of storm drain facilities. However, general replacement and maintenance of storm drain facilities is included in City plans and would comply with applicable environmental regulations. Therefore, cumulative development would have a less-than-significant cumulative impact related to the capacity or deterioration of storm drain facilities.			
UT-9. Cumulative Solid Waste Impacts. Cumulative development would generate solid waste within the permitted capacity of the SMART Station and Kirby Canyon Landfill. Cumulative development would not result in substantial deterioration of solid waste facilities. As such, cumulative impacts related to solid waste generation would be less than significant.	LTS	None required.	N/A
UT-10. Cumulative Energy Demand. Cumulative development in the City of Palo Alto would consume additional energy and, therefore, would increase the demand for energy. The City's electrical and natural gas facilities are projected to have adequate capacity to serve the City's increased demand for energy. The increased level of energy demand may trigger the need for the replacement or maintenance of energy facilities. However, general replacement and maintenance of energy facilities is expected and would comply with applicable environmental regulations. Therefore, cumulative development would not have a significant cumulative impact related to energy demand and energy facilities.	LTS	None required.	N/A

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In addition, the Scoping Report includes all oral comments that were identified as NOP scoping comments. Generally, the written comments pertained to the description of the SUMC Project; impacts related to land use, visual quality, traffic, air quality, noise, hydrology and water quality, cultural and historic resources, population and housing, community services and utilities, hazardous materials, and growth inducement; alternatives to the SUMC Project; cumulative impacts; and other miscellaneous issues. Each NOP comment has been reviewed and considered in preparing this EIR.

The SUMC Project would have significant and unavoidable project and/or cumulative impacts related to (impacts would not be avoided or reduced to less than significant by feasible mitigation measures):

- Deterioration of intersection level of service during Peak Hour conditions at three Menlo Park intersections (Middlefield Road and Willow Road, Bayfront Expressway and Willow Road, and University Avenue and Bayfront Expressway);
- Increased average daily traffic on four Menlo Park roadway segments, on Marsh Road, Sand Hill Road, Willow Road, and Alpine Road;
- Emission of criteria air pollutants (NOx) during construction, on both a project level and cumulative level;
- Emission of criteria air pollutants (ROG, NOx, PM_{10}) during operation, on both a project level and cumulative level;
- Contribution to cumulative emissions of toxic air contaminants;
- Emission of greenhouse gases, which would contravene the City's ability to meet emission reduction goals in the Palo Alto Climate Protection Plan and which would have a cumulatively considerable contribution to global climate change;
- Temporary but substantial noise during construction, on both a project level and cumulative level;
- Emission of ambulance noise along a new route along Sand Hill Road into the proposed Durand Way extension, so that noise levels at roadside residences would increase by a level considered unacceptable under the City's Comprehensive Plan;
- Demolition of an historical structure, the 1959 Hospital Building complex (also referred to as the Stone Building complex), which is a significant and unavoidable impact on both a project and cumulative level; and
- Removal of up to 71 Protected Trees, as defined in City of Palo Alto's Tree Protection and Management Regulations, which is a significant and unavoidable impact on both a project level and a cumulative level.

Due to these significant unavoidable environmental effects, approval of the SUMC Project would require the adoption of a Statement of Overriding Considerations, indicating that the City of Palo Alto is aware of the significant environmental consequences and believes that the benefits of approving the SUMC Project outweigh its unavoidable significant environmental impacts.

S.6 ALTERNATIVES

CEQA states, "An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives" (CEQA Guidelines Section 15126.6(a)). One of the alternatives analyzed must be the "no project" alternative. The "no project" analysis must discuss the existing conditions, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved and development continued to occur in accordance with existing plans and consistent with available infrastructure and community services (CEQA Guidelines, Section 15126.6(e)(3)(C)).

Description of SUMC Project Alternatives

No Project Alternative A: Retrofitting Only/ No New Structures. Under No Project Alternative A, only those hospital facilities that could be modified to meet the 2013 and 2030 deadlines would be retrofitted. No new buildings would be constructed. In the long-term, portions of the hospital facilities would not meet SB 1953 requirements for the 2030 deadline, and one or both of the hospitals would be closed. This alternative would require SHC and LPCH Hospitals to continue to operate beyond the 2013 deadline with reduced patient capacity. By 2013, SHC would have to move hospital functions out of the portion of the 1959 Hospital Building complex that could not be retrofitted to SB 1953 standards. The LPCH and the SoM would continue to use existing buildings for medical treatment, research, and teaching purposes, subject to seismic retrofit work. Under this alternative, there would be no new construction at the Hoover Pavilion Site and the interior of the existing Hoover Pavilion building would not need to be renovated to relocate the users of 1101 Welch Road. The demolition of existing sheds at that site also would not occur. No rezoning, annexation, or changes to existing land use designations would be required.

No Project Alternative B: Replace SB 1953 Noncompliant Structures at Maximum Allowable FAR. Under No Project Alternative B, hospital facilities that are not compliant with OSHPD structural standards would be replaced with new structures. New structures would be built out to the maximum size allowed under PF zoning. Under PF zoning for the Main SUMC Site, the maximum allowable floor to area ratio (FAR) is 1.0. The existing SUMC structures on the Main SUMC Site within the area zoned for PF, inboard of Welch Road, total 2,189,018 square feet on a 2,198,082-square-foot site. As a result, a 8,987-square-foot expansion of hospital facilities on the PF site could be achieved under the current zoning. The existing buildings on the Hoover Pavilion Site occupy the entire amount of the 0.25 FAR allowed on that site under existing PF zoning for that site; therefore, no buildings would be added at this location. No rezoning, annexation, or changes to existing land use designations would be required to replace the SB 1953 noncompliant buildings with the maximum allowable FAR.

LPCH would continue to use its existing facilities, with non-structural renovations made to noncompliant critical care areas. The SoM functions presently are located in other portions of the 1959 Hospital Building complex (Grant, Alway, Lane, and Edwards Buildings) and would continue to occupy those areas under this alternative. In addition, the existing buildings and storage sheds on the Hoover Pavilion Site would be preserved. It is assumed that No Project Alternative B would be completed by 2015.

Reduced Intensity Alternative A: Right-Size SHC and LPCH Facilities without Adding Beds. Under Reduced Intensity Alternative A, noncompliant facilities would be demolished and replaced with new structures. All other uses on the Main SUMC Sites would remain the same as under current conditions, subject to minor seismic retrofit work. In addition, the Hoover Pavilion would be internally renovated to accommodate additional clinic and office uses; however, no new structures would be constructed at this site. Construction of new hospital facilities would be limited to the minimum additional square footage required to right-size the existing LPCH and SHC facilities without adding space for additional growth. This alternative would expand the hospitals' existing floor area to provide additional space for the hospitals' existing number of beds, associated support areas, and emergency room. Unlike the previous two alternatives, the implementation of Reduced Intensity Alternative A would require rezoning of the Main SUMC Sites to accommodate proposed development intensities because the PF-zoned area is almost entirely built out under existing conditions.

Reduced Intensity Alternative B: Right-Size SHC and LPCH Facilities Plus Add Floor Area in an Amount Less Than the SUMC Project. Reduced Intensity Alternative B would include all of the components of Reduced Intensity Alternative A, but would also include additional square footage for clinics/medical offices, research facilities, and other non-hospital uses. Reduced Intensity Alternative A, described above, includes the components necessary to right-size the existing facilities at SHC and LPCH. The additions under Reduced Intensity Alternative B would be approximately 60 percent of the floor area of the SUMC Project medical offices and 60 percent of the floor area of the SUMC Project hospital space above the amounts needed for right-sizing. This threshold was chosen because it is anticipated that approximately 58 percent of net new growth in employment and patient activity would have occurred under 2015 conditions. Thus, 2015 trip generation is predicted to be 60 percent of project-related trip generation at buildout. This means that 60 percent of the growth in traffic would have occurred by 2015 under the SUMC Project, which corresponds to a 60 percent growth assumption under Reduced Intensity Alternative B.[27]

Tree Preservation Alternative. The Tree Preservation Alternative would seek to avoid the significant and unavoidable impact from the removal of Protected Trees, in particular, Protected Trees that are considered both biologically and aesthetically significant (as defined in more detail in Section 3.9, Biological Resources). The Tree Preservation Alternative would have the same development program as the proposed SUMC Project, including the same site plan and square footages for the LPCH Hospital and clinic/medical office buildings and for the Hoover Pavilion Site. In addition, the Tree Preservation Alternative would include the same square footages for the SHC Hospital and clinic/medical office buildings and the FIM 1 building as under the SUMC Project; however, the site

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[27] Fehr & Peers, 2015 Trip Generation Estimates for Stanford University Medical Center Environmental Impact Report. Memorandum from Robert Eckols, P.E. to Catherine Palter, Stanford Land Use and Environmental Planning, Bill Phillips, Stanford Real Estate, and Barbara Schussman, Bingham McCutchen, dated November 14, 2007.

plan and building footprints would be slightly different to avoid the removal of Protected Trees. Under the SUMC Project, a 64-foot-tall SHC hospital module ("Hospital Module Six") is proposed to be constructed on the Kaplan Lawn, which would result in the removal of Nine Protected Trees. The main difference under the Tree Preservation Alternative is that the square footage and programmatic functions planned for Hospital Module Six would be incorporated into the remaining five SHC hospital modules. This new modular plan of the SHC hospital building would be "tightened" somewhat through the use of a smaller structural grid and a reconfigured ambulance route. As such, Kaplan Lawn would not be developed, and no Protected Trees would be removed at that location. In addition, the FIM 1 building would be redesigned to save as many Protected Trees as possible in this area.

Historic Preservation Alternative. The Historic Preservation Alternative would seek to avoid the SUMC Project's significant and unavoidable impact from demolition of the 1959 Hospital Building complex, a historic resource (see Section 3.8, Cultural Resources). The Historic Preservation Alternative would retain the 1959 Hospital Building complex, which includes SoM buildings (Grant, Alway, Lane, and Edwards), along with the following SHC hospital/clinic buildings: West Pavilion ("West"), East Pavilion ("East"), Boswell, and Core.[28] However, these buildings have a low seismic rating and do not comply with structural and non-structural criteria that must be met by the 2013 and 2030 deadlines imposed by Senate Bill (SB) 1953 for retrofit or replacement of hospital facilities. Accordingly, under the Historic Preservation Alternative, these buildings would be used as clinics and medical offices, and not used as hospital buildings, as defined by the Office of Statewide Health Planning and Development (OSHPD). As such, all hospital functions would be moved out of the 1959 Hospital Building complex, as is contemplated under the SUMC Project, and the new SHC and LPCH hospital buildings would be constructed. However, similar to the Tree Preservation Alternative, the hospital module proposed in Kaplan Lawn under the SUMC Project would be absorbed into the main SHC Hospital building. This would help preserve the historic integrity of Pasteur Drive and the approach to the 1959 Hospital Building complex. In addition, as with the SUMC Project, the expanded LPCH clinic uses would be included in the new LPCH hospital building. The Historic Preservation Alternative would result in a slightly larger net increase in square footage than the SUMC Project since the 1959 Hospital Building complex would be retained.

Village Concept Alternative. The Village Concept Alternative, which would include the SUMC Project as proposed, would provide opportunities to enhance the SUMC Project by creating a more walkable, bikeable, mixed-use, transit-oriented, and well-connected urban environment. The Village Concept Alternative considers comprehensively and long-term the SUMC Project and the SUMC Project's relationship to its surrounding context. The Village Concept Alternative would recommend that 490 previously approved but not yet constructed housing units along Quarry Road and Pasteur Drive, on Stanford lands, be below market rate units that would be dedicated for occupancy by SUMC Project employees. In addition, a recommendation would be made by the City that these housing units be constructed within a specified timeline. The Village Concept Alternative would also include specific pedestrian linkages between the SUMC Project, the Stanford Shopping Center, Stanford University, the PAITS, and downtown, with corresponding urban design recommendations. Potential Development

[28] For ease of reference, the term "Core building" consists of the East Core, West Core, and Central Core portions unless otherwise noted. It does not include the 1973 Core Expansion Building.

Agreement components would be recommended for implementation of the Village Concept Alternative that the City would negotiate with the SUMC Project sponsor.

Alternatives Analysis

Table S-5 indicates whether each alternative has a greater, similar, or lesser impact than the SUMC Project. A more detailed analysis of the SUMC Project alternatives is provided in Section 5 of this document.

Environmentally Superior Alternative

On the basis of comparing the extent to which the alternatives reduce or avoid the SUMC Project's significant impacts, No Project Alternative A would be the environmentally superior alternative. However, CEQA requires the selection of another alternative other than the No Project Alternative as the environmentally superior alternative (see CEQA Guidelines, Section 15126.6(e)(2)); therefore, neither No Project Alternative A nor No Project Alternative B can be selected as the environmentally superior alternative.

Reduced Intensity Alternative B, the Tree Preservation Alternative, the Historic Preservation Alternative, and the Village Concept Alternative have similar impacts to the SUMC Project. The Tree Preservation Alternative would avoid the significant and unavoidable NOx construction emissions of the SUMC Project and these other alternatives. Under the Historic Preservation Alternative, the impacts on the Stone Building complex can be mitigated to less than significant, whereas this impact would be significant and unavoidable under these other alternatives. However, Reduced Intensity Alternative A would more so avoid several of the significant and unavoidable impacts identified for the SUMC Project. Since Reduced Intensity Alternative A would increase floor area, but not the number of beds or employees, operations at the SUMC Sites would not increase. Unlike the SUMC Project, Reduced Intensity Alternative A would reduce the significant and unavoidable operational intersection and roadway segment impacts to nil. In addition, although Reduced Intensity Alternative A would result in significant and unavoidable construction criteria air pollution emissions like the SUMC Project, this alternative would avoid the significant and unavoidable criteria air pollution that would be emitted during operation of the SUMC Project. Reduced Intensity Alternative A would also avoid the impacts related to the deterioration of the City's jobs to employed residents ratio. Reduced Intensity Alternative A would also avoid the significant and unavoidable greenhouse gas emissions under the SUMC Project and these alternatives.

However, Reduced Intensity Alternative A would still result in several of the significant and unavoidable impacts identified for the SUMC Project, including emission of ambulance noise along a new emergency vehicle route; demolition of a portion of the 1959 Hospital Building complex; and the removal of several Protected Trees. Nonetheless, Reduced Intensity Alternative A would avoid more significant and unavoidable SUMC Project impacts than the other alternatives (besides the No Project Alternatives) and therefore is considered the environmentally superior alternative. Refer to Section 5, Alternatives, for a more detailed explanation regarding all alternative impacts.

Table S-5
Assessment of SUMC Project Alternatives (Compared to the SUMC Project)

Impact	SUMC Project[a]	No Project Alternative A	No Project Alternative B	Reduced Intensity Alternative A	Reduced Intensity Alternative B	Tree Preservation Alternative	Historic Preservation Alternative	Village Concept Alternative
Land Use								
Conflicts with Applicable Land Use Designations and Zoning	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Conflicts with Comprehensive Plan Policies	S/LTS	S/SU	S/SU	S/SU	S/LTS	S/LTS	S/LTS	S/LTS
Compatibility with Adjacent Land Use Character and Conflicts with Established Residential, Recreational, Educational, Religious, or Scientific Uses in the Area	NI	NI	NI	NI	NI	NI	NI	NI
Division of an Established Community and Farmland Conversion	NI	NI	NI	NI	NI	NI	NI	NI
Adverse Changes to Existing or Planned Land Use Pattern	S/LTS	NI	NI	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Cumulative Impacts	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Visual Quality								
Temporary Degradation of Visual Quality	S/LTS	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Permanent Degradation of Visual Character Post Construction	S/LTS	LTS	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Alteration of Public Viewsheds, View Corridors, or Scenic Roads	S/LTS	NI	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Terrain Modification	NI	NI	NI	NI	NI	NI	NI	NI
New Source of Light and Glare	S/LTS	NI	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Shadowing of Public Open Spaces	LTS	NI	LTS	LTS	LTS	LTS	LTS	LTS
Cumulative Impacts	LTS	NI	LTS	LTS	LTS	LTS	LTS	LTS

NI = No Impact *LTS = Less-than-Significant* *S=Significant* *SU= Significant Unavoidable*

Table S-5
Assessment of SUMC Project Alternatives (Compared to the SUMC Project)

Impact	SUMC Project[a]	No Project Alternative A	No Project Alternative B	Reduced Intensity Alternative A	Reduced Intensity Alternative B	Tree Preservation Alternative	Historic Preservation Alternative	Village Concept Alternative
Transportation								
Construction Impacts	S/LTS	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Intersection LOS	S/SU	NI	NI	NI	S/SU	S/SU	S/SU	S/SU
Impacts on Roadway Segments	S/SU	NI	NI	NI	S/LTS	S/SU	S/SU	S/SU
Local Circulation Impacts	S/LTS	NI	NI	NI	S/LTS	S/LTS	S/LTS	S/LTS
Freeway Impacts	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Bicycle and Pedestrian Impacts	S/LTS	NI	NI	NI	S/LTS	S/LTS	S/LTS	S/LTS
Transit Impacts	S/LTS	NI	NI	NI	S/LTS	S/LTS	S/LTS	S/LTS
Parking Impacts	LTS	NI	NI	NI	S/LTS	LTS	LTS	LTS
Emergency Impacts	S/LTS	NI	NI	NI	S/LTS	S/LTS	S/LTS	S/LTS
Cumulative Impacts	S/LTS	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Air Quality								
Construction Criteria Air Pollution Emissions	S/SU	S/LTS	S/SU	S/SU	S/SU	S/LTS	S/SU	S/SU
Operational Criteria Air Pollution Emissions	S/SU	NI	NI	LTS	S/SU	S/SU	S/SU	S/SU
Construction and Operational TACs	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Cumulative Impacts	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU
Climate Change								
Consistency with the Climate Protection Plan	S/SU	LTS	LTS	LTS	S/LTS	S/SU	S/SU	S/SU
Result in Significant Emissions of Greenhouse Gases	S/SU	LTS	LTS	LTS	S/LTS	S/SU	S/SU	S/SU

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Table S-5
Assessment of SUMC Project Alternatives (Compared to the SUMC Project)

Impact	SUMC Project[a]	No Project Alternative A	No Project Alternative B	Reduced Intensity Alternative A	Reduced Intensity Alternative B	Tree Preservation Alternative	Historic Preservation Alternative	Village Concept Alternative
Noise								
Construction Impacts	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU
Operational Impacts	S/SU	NI	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU
Cumulative Impacts	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU
Cultural Resources								
Impacts on the Stone Building Complex	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/LTS	S/SU
Impacts on the Hoover Pavilion	S/LTS	NI	NI	LTS	S/LTS	S/LTS	S/LTS	S/LTS
Impacts on Archaeological Resources and Human Remains	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Impacts on Paleontological Resources	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Cumulative Impacts	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/LTS	S/SU
Biological Resources								
Special Status Plant or Wildlife Resources	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Loss of Riparian or Other Sensitive Habitats	LTS	NI	LTS	LTS	LTS	LTS	LTS	LTS
Interference with Species Movement, Wildlife Corridors, or Nursery Sites	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Effect on Protected Trees	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU
Conflicts with a Habitat Conservation Plan or Natural Community Conservation Plan	NI	NI	NI	NI	NI	NI	NI	NI
Cumulative Impacts	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU
Geology, Soils, and Seismicity								
Exposure to Seismic-Related Hazards	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Exposure to Other Geotechnical Hazards	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

NI = No Impact *LTS = Less-than-Significant* *S=Significant* *SU= Significant Unavoidable*

Table S-5
Assessment of SUMC Project Alternatives (Compared to the SUMC Project)

Impact	SUMC Project[a]	No Project Alternative A	No Project Alternative B	Reduced Intensity Alternative A	Reduced Intensity Alternative B	Tree Preservation Alternative	Historic Preservation Alternative	Village Concept Alternative
Cause Substantial Erosion or Siltation	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Cumulative Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Hydrology								
Flood Risks and Flood Flows	NI	NI	NI	NI	NI	NI	NI	NI
Groundwater Recharge and Local Water Table	LTS	NI	LTS	LTS	LTS	LTS	LTS	LTS
Groundwater Quality	S/LTS	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Stormwater Runoff, Erosion, and Streambank Instability	LTS	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Flooding and Stormwater Conveyance Capacity	LTS	NI	LTS	LTS	LTS	LTS	LTS	LTS
Degradation of Surface Water Quality	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Dam Failure Inundation	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Violation of Any Water Quality Standard or Waste Discharge Requirement (WDRs)	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Cumulative Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Hazardous Materials								
Exposure to Hazardous Materials During Construction	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Exposure to Hazardous Materials During Operation	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Safety Hazards to Schools	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Wildfire Risks	NI	NI	NI	NI	NI	NI	NI	NI
Safety Hazards from Public Airports	NI	NI	NI	NI	NI	NI	NI	NI
Emergency Response or Evacuation Plans	S/LTS	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Cumulative Impacts	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS

NI = No Impact *LTS = Less-than-Significant* *S=Significant* *SU= Significant Unavoidable*

Table S-5
Assessment of SUMC Project Alternatives (Compared to the SUMC Project)

Impact	SUMC Project[a]	No Project Alternative A	No Project Alternative B	Reduced Intensity Alternative A	Reduced Intensity Alternative B	Tree Preservation Alternative	Historic Preservation Alternative	Village Concept Alternative
Population and Housing								
Population Increases	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Displacement of Housing	NI	NI	NI	NI	NI	NI	NI	NI
Jobs to Employed Residents Ratio	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cumulative Impacts	S/SU	NI	NI	NI	LTS	LTS	LTS	LTS
Public Services								
Impacts on Police Services	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Impacts on Fire Services	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Impacts on Schools	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Impacts on Parks and Recreation	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Cumulative Impacts	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Utilities								
Water Demand	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Wastewater Generation	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Stormwater Generation	LTS	NI	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Solid Waste Generation	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Energy Demand	LTS	NI	LTS	LTS	LTS	LTS	LTS	LTS
Cumulative Impacts	LTS	NI	LTS	LTS	LTS	LTS	LTS	LTS

Source: PBS&J, 2010.

Notes:

a. Before mitigation/After mitigation (e.g. S/LTS)

NI = No Impact *LTS = Less-than-Significant* *S=Significant* *SU= Significant Unavoidable*

S.7 AREAS OF CONTROVERSY

The City distributed a Notice of Preparation (NOP), Appendix A of this document, on August 22, 2007, announcing its intent to prepare and distribute an EIR for the SUMC Renewal and Replacement Project. As stated in Section 1, Introduction, the City provided a 41-day comment period from August 22 to October 1, 2007 (this comment period was longer than the 30 days required by CEQA). In response to the NOP, public agencies and private individuals submitted comment letters to the City. The written comments that were received are listed and attached to a separate Scoping Report[29] that is available at the City's Planning Department upon request. The Scoping Report includes all oral comments that were identified as NOP scoping comments. The following are key areas of controversy that were submitted as a response to the NOP; applicable issues that were identified mostly pertain to:

- Land Use- the modification of existing zoning and land use designations, and mitigation of the environmental impacts that might result from such actions.
- Visual Quality- impacts of proposed buildings on views from residential areas, from the El Camino Real corridor (the gateway into Palo Alto from Menlo Park), and from where the structures would be most visible; shadow impacts; loss of open space; and impacts on views of the Hoover Pavilion.
- Transportation- parking supply; auto, transit, bicycle, and pedestrian circulation; ambulance access to the hospital; and impacts to specific roads and intersections.
- Air Quality- vehicular emissions and the associated health impacts.
- Climate Change- the use of the most recent State standards in the analysis; the acknowledgement of more comprehensive future greenhouse gas regulations; the explanation of how Project contributions would be measured; and that emissions be assessed in light of net increases.
- Noise- impacts related to ambulance, helicopter, vehicular traffic, and construction noise; an analysis of noise related to the Emergency Department; and an analysis of noise levels throughout the day.
- Cultural Resources- impacts on Governor's Lane, the Edward Durell Stone Building (also referred to as the Stone Building complex), and the Hoover Pavilion.
- Geology- the consideration of the placement of workforce housing in relation to fault lines and levees; identification of which portions of the SUMC Project constituted rehabilitation to meet State requirements for structural stability and which portions constituted expansion of the existing facilities; and examination of the capacity of local geological materials to support the deeper subsurface levels of the proposed towers.

[29] Trixie Martelino, Project Manager, PBS&J, Scoping Report memorandum prepared for the City of Palo Alto, December 4, 2007. Available upon request from the City of Palo Alto Planning and Community Environment Department, 250 Hamilton Avenue, Palo Alto, CA 94301.

- Hydrology- the potential for impacts on San Francisquito Creek, which runs north of the Project Area.
- Population and Housing- the number and types of housing demand (by affordability level) from employment, a discussion of increased employment, and a discussion of effects on the City's jobs-housing balance.
- Public Services- impacts on recreational amenities and schools.
- Utilities- impacts on water supply, including the need to conduct a water supply assessment, potential impacts on the Hetch Hetchy water system, recommendations for water conservation techniques, and the need to evaluate the potential use of recycle water; the SUMC Project recycling and disposal programs; and compliance with the City's Zero Waste Strategic Plan.

S.8 ISSUES TO BE RESOLVED

In accordance with CEQA Guidelines, Section 15123(b)(3), this Summary must identify issues to be resolved including whether or how to mitigate the significant effects and the choice among alternatives.

Section 3 of the Draft EIR presents mitigation measures to reduce or avoid significant impacts identified for the SUMC Project. In some instances, the Draft EIR identifies mitigation options to address specific impacts. During the CEQA environmental review process, the City will need to resolve which mitigation measures are suitable and whether they can effectively reduce impacts to a less-than-significant level. A Mitigation Monitoring and Reporting Program (MMRP) will be prepared to define the timing of implementation of the measures, parties responsible for implementation, and parties responsible for reporting and verifying implementation.

The Draft EIR identifies impacts that would remain significant and unavoidable even after implementation of the proposed mitigation measures. Consequently, the City will need to determine whether to approve the SUMC Project as proposed and, if so, provide its rationale in a Statement of Overriding Considerations.

Finally, Section 5 of this EIR presents the alternatives for the SUMC Project. Although six out of seven of the SUMC Project alternatives would feasibly attain most of the objective of all SUMC Project sponsors, the Village Concept Alternative would meet the objectives of the SUMC Project plus the objectives of the City of Palo Alto. However, none of these alternatives would avoid all of the significant and unavoidable impacts of the SUMC Project. The City will need to resolve whether these options or others that have not been considered are preferable from an environmental and community perspective, compared to the SUMC Project as proposed.

Section 1
Introduction

1.1 PURPOSE OF THIS ENVIRONMENTAL IMPACT REPORT

This Environmental Impact Report (EIR) addresses the potential environmental effects of the construction and operation of the Stanford University Medical Center Facilities Renewal and Replacement Project (SUMC Project). For the purposes of this analysis, the SUMC Sites collectively refers to the two sites wherein the SUMC Project would occur: the Main SUMC Site and the Hoover Pavilion Site, as explained further in Section 2, Project Description. The SUMC Sites are located within the City of Palo Alto (City) and generally are bounded to the south and west by Stanford University lands in unincorporated Santa Clara County (County).

The SUMC Project is proposed jointly by Stanford Hospital and Clinics (SHC), the Lucile Packard Children's Hospital (LPCH), and the Stanford University School of Medicine (SoM), which are collectively referred to here as the SUMC Project sponsors. The SUMC Project would demolish and replace on-site structures, adding approximately 1.3 million square feet of net new floor area, broken down as follows:[1]

- Demolition, renovation, and construction of SHC facilities, providing a net increase of approximately 824,000 square feet;
- Demolition, renovation, and construction of LPCH facilities, resulting in approximately 442,000 additional square feet;
- Demolition of four existing SoM buildings and construction of three replacement buildings, with no net increase in square feet;
- Demolition of shops and storage space, renovation of existing Hoover Pavilion, and net addition of approximately 46,000 square feet of new medical, office, research, clinic, and administrative facilities at the Hoover Pavilion Site for medical offices for community practitioners, and SUMC-related medical offices, clinical facilities, and support uses;
- Demolition of existing parking spaces and construction of 2,985 new and replacement spaces, for a net increase of 2,053 spaces to address additional demand for the SUMC Project, to be located in surface parking, and aboveground and underground structures;
- Construction of a new road connecting Sand Hill and Welch Road, and provision of interior driveways and improved circulation connections including the extension of Quarry Road to Roth Way;

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[1] Stanford University Medical Center) Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 13, 2007, as amended on September 28, 2207, October 31, 2007, April 14, 2008, May 30, 2008, October 23, 2008, December 11, 2008, June 2, 2008, March 8, 2010, and March 25, 2010.

- Widening of Welch Road by the addition of a third lane to accommodate left turns in both directions; and
- Related on-site and off-site improvements.

The SUMC Project sponsors have applied for amendments to the City's Comprehensive Plan, adoption of a new zoning district, changes in zoning boundaries, a jurisdictional boundary change, and design review approvals. The SUMC Project sponsors have also applied to the City for a development agreement, as authorized by Section 65865 of the California Government Code. This EIR is intended to satisfy CEQA's environmental review requirements applicable to the City's approval of necessary entitlements and execution of the requested development agreement with the SUMC Project sponsors.

The lead agency for an EIR is the public agency that has the principal responsibility for carrying out or approving a project. This EIR has been prepared by the City of Palo Alto, which is the lead agency for the SUMC Project. This EIR assesses the potential for significant impacts including, but not limited to, those concerning land use issues, visual quality, transportation, air quality, climate change, noise, cultural resources, biological resources, geology, hydrology, hazardous materials, population and housing, public services, and utilities. As defined in the CEQA Guidelines Section 15382, a "significant effect on the environment" is:

> . . . a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant.

Because the SUMC Project involves significant changes to the City's existing zoning for the sites in question, as well as development agreement approval, it is anticipated that the City Council, in the exercise of its legislative police power authority, will require modifications to the SUMC Project from what is proposed by the applicant. This EIR anticipates the potential for such modifications, and analyzes their environmental impacts as well, primarily in the analysis of project alternatives.

This EIR is prepared in accordance with CEQA, as amended, and the CEQA Guidelines. As the CEQA Guidelines state, an EIR is an "informational document" intended to inform public agency decision-makers and the public of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the SUMC Project. Although this EIR does not control the decision to approve the SUMC Project, the City of Palo Alto will use the certified EIR, along with other information and public processes, to determine whether to approve, modify, or disapprove the SUMC Project, and to specify any applicable mitigation measures as part of conditions of project approvals. Further, because development agreements are optional, and are not required entitlements, the City may approve the SUMC Project but disapprove the SUMC development agreement. If the City approves the SUMC Project, the City must consider and apply the information in this EIR and adopt findings regarding each significant effect identified in this EIR.

1.2 EIR PROCESS

Initiating the Environmental Review Process

The City distributed a Notice of Preparation (NOP) on August 22, 2007, announcing its intent to prepare and distribute an EIR analyzing the impacts of the SUMC Project. Appendix A contains the NOP. The NOP identified two separate projects, including the SUMC Project and the Simon Property Stanford Shopping Center Expansion. In 2007, the Simon Property Group submitted an application to expand the Stanford Shopping Center and construct a boutique hotel.[2] Stanford University owns the property occupied by the Stanford Shopping Center, and the Simon Property Group leases this property from Stanford University and operates the Stanford Shopping Center. As such, the application was submitted with the approval of Stanford University. However, this application was withdrawn in April 2009. Given Stanford University's statement that it intends to focus its development efforts on the SUMC Project,[3] and due to the current economic downturn and changing retail trends, the scope of any future development at the Stanford Shopping Center is too speculative to analyze at this point. As such, this EIR addresses only the SUMC Project. (See Section 3.1, Introduction to the Environmental Analysis, for a discussion of the assumptions in defining cumulative scenario.)

As indicated in the NOP, the City provided a 41-day comment period from August 22 to October 1, 2007 (this comment period was longer than the 30 days required by CEQA). In response to the NOP, public agencies and private individuals submitted comment letters to the City. The written comments that were received are listed and attached to a separate Scoping Report[4] that is available at the City's Department of Planning and Community Environment upon request. During the NOP comment period, the City also received oral comments at the Planning and Transportation Commission on September 5, 2007 and at the City Council scoping session on September 24, 2007. The Scoping Report includes all oral comments that were identified as NOP scoping comments.

Generally, the written comments pertained to the description of the SUMC Project; impacts related to land use, visual quality, traffic, air quality, noise, hydrology and water quality, cultural and historic resources, population and housing, community services and utilities, hazardous materials, and growth inducement; alternatives to the SUMC Project; cumulative impacts; and other miscellaneous issues. Each NOP comment has been reviewed and considered in preparing this EIR. The Introduction to each environmental topic within Section 3 provides a summary of the relevant NOP scoping comments.

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2 Simon Property Group, "Simon Properties – Stanford Shopping Center Expansion Application," August 20, 2007.

3 Barbara Schussman, Bingham McCutchen LLP, Letter to Cara Silver, Senior Assistant City Attorney, April 16, 2009.

4 Trixie Martelino, Project Manager, PBS&J, Scoping Report memorandum prepared for the City of Palo Alto, December 4, 2007. Available upon request from the City of Palo Alto Department of Planning and Community Environment, 250 Hamilton Avenue, Palo Alto, CA 94301.

Draft EIR

As previously stated, this Draft EIR provides an analysis of physical impacts anticipated to result from the SUMC Project and any other activities that might be authorized through the development agreement. Where significant impacts are identified, the Draft EIR recommends feasible mitigation measures to reduce or eliminate the significant impacts and identifies which significant impacts are unavoidable. Alternatives to the SUMC Project are also presented. This environmental document is considered a draft under CEQA since it must be reviewed and commented upon by public agencies, organizations, and individuals before being finalized.

Public Review

This Draft EIR is being distributed for a 62-day public review and comment period.[5] Readers are invited to submit written comments on the document (e.g., does this Draft EIR identify and analyze the possible environmental impacts and recommend appropriate mitigation measures? Does it consider and evaluate a reasonable range of alternatives to the SUMC Project?). Comments are most helpful when they suggest specific alternatives or measures that would better mitigate significant environmental effects. CEQA Guidelines Section 15096(d) calls for responsible agencies[6] to provide comments on those project activities within the agency's area of expertise and to support those comments with either oral or written documentation.

Written comments should be submitted to:

Steven Turner, Advance Planning Manager
City of Palo Alto
Planning and Community Environment Department
250 Hamilton Avenue
Palo Alto, CA 94301
Email: Stanford.Project@cityofpaloalto.org

A public hearing to take oral comments on the Draft EIR will be held before the Planning and Transportation Commission and possibly also the City Council. The hearings may be held separately or jointly. Hearing notices will be mailed to responsible agencies. Additionally, all hearings will be noticed and advertised in the following ways, including but not limited to:

- Notice in local newspapers;
- Written notice to all persons on the Stanford Projects "interested persons" list, which includes those who have attended public meetings and who have specifically requested to be added to the "interested persons" list, and other known parties;
- Written notice to all neighboring jurisdictions, including but not limited to Santa Clara County, the cities of Menlo Park, East Palo Alto, Mountain View, Los Altos Hills, Portola Valley, and Woodside; and
- Notice on the City's website.

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5 The public review period is longer than the required 45 days under CEQA.

6 CEQA Section 21069 defines a responsible agency as a public agency, other than the lead agency, which has responsibility for carrying out or approving a project.

Final EIR

Following the close of the public review and comment period, written responses will be prepared that address all substantive written and oral comments on the Draft EIR. The Final EIR will consist of the Draft EIR, the comments received during the public review period, responses to the comments, and any revisions to the Draft EIR as a result of public agency and public comments.

Project Review and Approval

The Palo Alto City Council must ultimately certify that it has reviewed and considered the information in the EIR and that the EIR has been completed in conformity with the requirements of CEQA before any decision can be made regarding the SUMC Project. Pursuant to CEQA Guidelines Section 15091, no public agency shall approve or carry out a project for which an EIR has been certified which identifies one or more significant effects of that project unless the public agency makes one or more of the following findings, which must be supported by substantial evidence in the record:

- Changes or alterations have been required in, or incorporated into, the project which avoid or substantially lessen the significant environmental effect as identified in the Final EIR.
- Such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency.
- Specific economic, legal, social, technological, or other considerations, including provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or project alternatives identified in the Final EIR.

Mitigation Monitoring and Reporting Program

Pursuant to CEQA Guidelines Section 15097, if it approves the SUMC Project, the City must adopt a Mitigation Monitoring and Reporting Program (MMRP) for the SUMC Project. An MMRP is a mechanism used for the monitoring and reporting of revisions to the project or conditions of approval that the public agency has required as mitigation measures to lessen or avoid significant environmental effects. The City can conduct the reporting or monitoring, or it can delegate the responsibilities to another public agency or a private entity that accepts the delegation. Implementation of the MMRP would reduce the severity or eliminate the identified significant impacts.

Statement of Overriding Considerations

If the City of Palo Alto decides to approve the SUMC Project, and if the SUMC Project would result in significant impacts that cannot be mitigated to less-than-significant levels, then the City must indicate that any such unavoidable significant impacts are acceptable due to overriding considerations as described in CEQA Guidelines Section 15093. This is known as a "Statement of Overriding Considerations." In preparing this statement, CEQA requires the City to balance the benefits of the project against its unavoidable environmental effects. If the City finds that the benefits of the project being considered outweigh the project's unavoidable adverse environmental effects, then the adverse environmental effects may be considered acceptable (CEQA Guidelines Section 15093).

Even if a Statement of Overriding Considerations is adopted for the SUMC Project, a MMRP (as described above) would be adopted to reduce significant project impacts to the extent feasible, including those impacts that cannot be reduced to a less-than-significant level. The City would use the MMRP as a mechanism to ensure that mitigation measures imposed as conditions of approval are implemented during and after construction so as to control and minimize project impacts.

1.3 USE OF THIS REPORT

An EIR is an informational document, with the purpose to make the public and decision-makers aware of the environmental consequences of a project. As noted earlier, the City of Palo Alto is the lead agency for the EIR. Thus, the Palo Alto City Council and Planning and Transportation Commission will review this report and weigh its contents against economic, social, neighborhood, and other considerations to determine whether the SUMC Project and any other activities contemplated by the Development Agreement should be approved as proposed, approved with conditions, or not approved.

Applicable City departments have reviewed this Draft EIR to ensure it reflects the City's independent judgment. The surrounding residents and businesses, and any other interested individuals, may also review the EIR to evaluate the effects of the SUMC Project and any other activities approved through the development agreement on existing conditions in the City, and to assess the proposed mitigation measures' ability to reduce potential environmental consequences.

Other public agencies, in addition to the lead agency, may have discretionary approval over the SUMC Project. These agencies, known as responsible agencies, will also review the Draft EIR and may comment during the public review period. A list of approvals that may be required from these responsible agencies is provided in Section 2, Project Description. Those agencies will in turn use this EIR to inform their own decision-making processes for the SUMC Project.

1.4 REPORT ORGANIZATION

This section provides an overview of the EIR, its purpose, and its intended uses. Section 2, Project Description, provides a description of the SUMC Project's land use, development, circulation, and design features, and summarizes the various approvals that might be granted for the SUMC Project. Section 3, Environmental Analysis, analyzes the potential environmental impacts from the SUMC Project in various categories, including land use, visual quality, transportation, air quality, climate change, noise, cultural resources, biological resources, geology, hydrology, hazardous materials, population and housing, public services, and utilities. The analysis for each category in Section 3 is divided into two parts:

- The **Setting** section provides a general overview of existing conditions on and adjacent to the SUMC Sites. Federal, State, and local regulations are also identified and discussed when relevant.

- The **Impacts and Mitigation Measures** section provides a description of the criteria used to evaluate whether an impact is considered significant. Here, the City's significance criteria are applied. The City's significance criteria are based on standards identified in CEQA, the State CEQA Guidelines, applicable public policies and regulations, professional judgment, and judicial decisions. The Palo Alto City Council has not formally adopted local significance criteria, but over the past few years the City has developed and utilized criteria based on the CEQA Guidelines and current City policy. The thresholds of significance identified in this document are based upon the same thresholds that are or have been used in other major City environmental documents, although the City continues to refine these thresholds to ensure that they address all potential environmental impacts.

  The potential environmental impacts of the SUMC Project are enumerated, summarized, and discussed. If the potential impact is determined to be less than significant, no mitigation measures are required. If the potential impact is determined to be significant, potentially feasible mitigation measures that would reduce the impact are identified. The significance of the impact after mitigation is also indicated.

Section 3 also includes an analysis of the cumulative impacts of the SUMC Project combined with other past, present, and reasonably foreseeable future projects. (In the case of the climate change discussion, the entirety of that discussion is in a cumulative context because climate change is a global cumulative impact.)

Section 4, Other CEQA Considerations, discusses other topical issues required by CEQA, such as unavoidable adverse effects, and growth-inducing effects. Section 5, Alternatives, contains a description and assessment of alternatives to the SUMC Project, including, among others, two No Project Alternatives, and identifies the environmentally superior alternative.

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Section 2
Project Description

2.1 INTRODUCTION

This Environmental Impact Report (EIR) addresses the Stanford University Medical Center Facilities Renewal and Replacement Project (SUMC Project). The SUMC Project is being proposed jointly by Stanford Hospital and Clinics (SHC), the Lucile Packard Children's Hospital (LPCH), and the Stanford University School of Medicine (SoM), which are collectively referred to here as the SUMC Project sponsors. The SUMC Project would demolish, renovate, and replace on-site structures, thereby adding approximately 1.3 million square feet of net new floor area, broken down as follows:

- Demolition, renovation, and construction of SHC facilities, providing a net increase of approximately 824,000 square feet;
- Demolition, renovation, and construction of LPCH facilities, resulting in approximately 442,000 additional square feet;
- Demolition of four existing SoM buildings and construction of three replacement buildings, with no net increase in square feet;
- Demolition of shops and storage space, renovation of existing Hoover Pavilion, and net addition of approximately 46,000 square feet of new medical, office, research, clinic, and administrative facilities at the Hoover Pavilion Site for medical offices for community practitioners and SUMC-related medical offices, clinical facilities, and support uses;
- Demolition of existing parking spaces and construction of 2,985 new and replacement spaces, for a net increase of 2,053 spaces to address additional demand for the SUMC project, to be located in surface parking and above- and underground structures;
- Construction of a new road connecting Sand Hill Road and Welch Road, and provision of interior driveways and improved circulation connections, including the extension of Quarry Road to Roth Way;
- Widening of Welch Road by the addition of a third lane to accommodate left turns in both directions; and
- Related on-site and off-site improvements.

The SUMC Project sponsors have applied to the City for a Comprehensive Plan Amendment, rezoning, architectural review, annexation of a small piece of land adjacent to the SoM, and a possible development agreement. This EIR is intended to satisfy CEQA's environmental review requirements applicable to the City's approval of each of the requested entitlements, execution of the requested Development Agreement with the SUMC Project sponsors, subsequent City approvals and/or modifications to the SUMC Project as proposed, approvals by other responsible agencies, and construction and operation of the proposed SUMC Project.

2.2 LOCATION OF PROJECT[1]

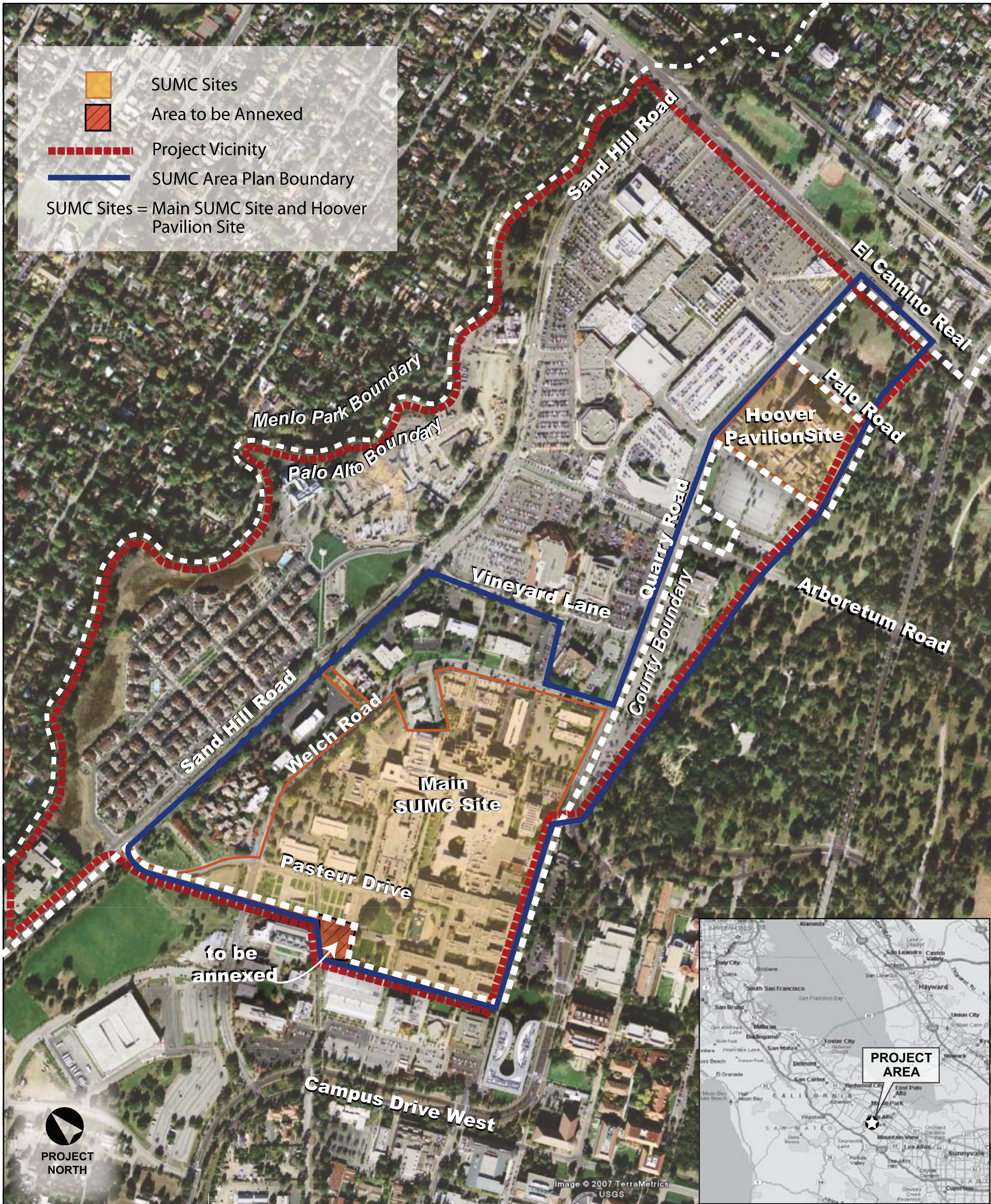
The SUMC Project would occur on two sites that are collectively about 66 acres: the approximately 56-acre Main SUMC Site and the approximately 9.9-acre Hoover Pavilion Site. The sites are also referred to here as the SUMC Sites. The Main SUMC Site is south of Sand Hill Road and is primarily bounded to the north and east by Welch Road, to the south by Quarry Road, and to the west by Stanford University lands. A 0.75-acre portion of the SoM area within the Main SUMC Site is located in unincorporated Santa Clara County, and is proposed for annexation to the City of Palo Alto. The Hoover Pavilion Site is about 1,700 feet east of the Main SUMC Site, at the southwestern corner of Quarry Road and Palo Road. Figure 2-1 shows these two sites. The land owner of both the Main SUMC Site and the Hoover Pavilion Site is Stanford University. SHC and LPCH lease the land under and near their buildings on both sites.

Subsequent portions of this EIR may discuss resources within the larger Project Vicinity, which collectively refers to the two SUMC Sites and the surrounding areas within City limits. The Project Vicinity coincides generally with "Area 9" under Palo Alto General Plan Policy L-8, except that it also includes the two underdeveloped parcels that are east and west of the Hoover Pavilion Site and are within Santa Clara County jurisdiction; it thus generally a distinct planning area within the City. The Project Vicinity is generally bounded to the north by San Francisquito Creek, to the east by El Camino Real, and to the south and west by unincorporated Santa Clara County (containing Stanford University lands). Regional access to the Project Vicinity is via Interstate 280 (I-280), roughly 1.9 miles to the west; US Highway 101 (US 101), roughly 1.8 miles to the east; and State Route 82 (SR 82 [El Camino Real]), which is adjacent to the Project Vicinity. Access to the Project Vicinity is also available via Caltrain; the nearest Caltrain station is about 1,200 feet east of the Hoover Pavilion Site and 3,400 feet east of the Main SUMC Site (with connections via the Marguerite shuttle). Figure 2-1 depicts the Project Vicinity location as well as the SUMC Sites. Demolition, renovation, and construction of the SUMC Project would be located entirely within the SUMC Sites, but not within the entirety of the Project Vicinity.

The Project Vicinity and surrounding lands encompass pedestrian, bicycle, transit, and vehicle linkages, and connections between the SUMC Sites, as well as linkages from the SUMC Sites to other areas of the City, including the Palo Alto Intermodal Transit Station (PAITS), the Downtown area, and nearby residential neighborhoods. Housing sites identified in the Draft 2007 Stanford University Medical Center Area Plan Update[2] are located in the general area of the SUMC Project, immediately east and west of the Hoover Pavilion Site, and at the corner of Pasteur Drive and Sand Hill Road. The SUMC Project as proposed by the SUMC Project sponsors includes improvements to linkages within the SUMC Sites, but does not include improvements to off-site linkages or construction of new housing.

1 For the purposes of this analysis, true northwest is considered project north.

2 The Draft 2007 SUMC Area Plan Update is not a regulatory document and does not comprise a coordinated area plan or specific plan under the City's Municipal Code. It was prepared pursuant to Program L-46 of the City's Comprehensive Plan as a guidance document for the City, Stanford, and the public to provide an overview and context for anticipated future development at the SUMC. The Draft 2007 SUMC Area Plan Update also discusses key connections and linkages between the SUMC Sites and surrounding areas as well as key urban design objectives for the SUMC Project.



Source: PBS&J, 2009.

PBS&J

FIGURE 2-1
Project Vicinity Location

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2.3 PROJECT OBJECTIVES

SUMC Project Sponsors Objectives

The SUMC Project sponsors have identified various objectives for the SUMC Project. The objectives are listed below. These objectives are divided into three categories: Program, Siting, Circulation, and Cost. The Program objectives are further sub-divided by entity (SHC and LPCH, and SoM).

Program Objectives

SHC and LPCH. The Program objectives of SHC and LPCH are listed below.

- Optimize delivery of healthcare and services to patients.
- Maintain each hospital's position as a leading provider of complex care.
- Achieve timely compliance with the requirements of Senate Bill 1953[3] and other applicable code requirements:
  - Replace the SHC portion of the 1959 Hospital Building complex (the 1959 Hospital Building complex is also referred to as the Stone Building complex), comprising 188 beds, in its entirety;
  - Meet SB 1953's 2013 non-structural criteria for all 66 intensive care beds at SHC, the Emergency Department (ED), and the 21 operating rooms at SHC in the most efficient manner;
  - Complete required non-structural renovations[4] to critical areas at LPCH;
  - Provide sufficient space for patients and families during construction of required renovations or replacements;
  - Meet SB 1953's 2030 criteria in the most efficient manner; and
  - Design new facilities to comply with applicable ventilation and structural requirements.
- Meet existing and projected future demand for patient care:[5]
  - Relieve the existing shortages of beds at SHC and LPCH;
  - Provide additional patient rooms and facilities at SHC to meet the projected needs of an aging population;
  - Provide additional patient rooms and facilities at LPCH to meet projected growing demand for LPCH services;

3 Please see Section 2.5, "Seismic Safety," for a description of SB 1953 and its requirements.
4 Non-structural renovations consist of securing interior fixtures, ceilings, sprinkler systems, bracing, and duct work in the event of an earthquake. Such renovations are required for all critical care areas by 2013.
5 A description of the existing demand for healthcare and the current deficit of available space to accommodate those demands is presented in Section 2.5, under the "Spatial Constraints" heading.

- Size the ED to provide adequate patient waiting and triage space, and trauma rooms consistent with contemporary facility standards;
- Meet existing and projected demand for clinic and other outpatient services that are important to the core academic and translational discovery process,[6] or that otherwise should remain co-located with inpatient services; and
- Provide sufficient space to replace medical offices removed due to demolition, and to accommodate increased space for both medical offices and support services due to existing and projected future growth in need for patient services.

- Provide modern, state-of-the-art facilities, designed to deliver high quality healthcare services and related teaching and research:
  - Size facilities to accommodate advanced medical services, state-of-the-art imaging, modern diagnostic and other medical equipment, and to provide sufficient space for high quality patient care and associated support services;
  - Design facilities to enhance the comfort and healing of patients and the productive care-giving and general welfare of staff and visitors;
  - Meet current hospital planning guidelines by providing space to accommodate patients in single-bed rooms as appropriate, including adequate space for treatment by healthcare providers, equipment and support by family members;
  - Minimize the distance of travel from procedure room to patient room;
  - Provide a safe, secure, and efficient route from operating rooms or the Emergency Department (ED) to patient rooms; and
  - Minimize patients' risk of infection.
- Meet regional needs for emergency and disaster preparedness:
  - Design facilities to take into account needs identified in the region's Disaster Preparedness Program, such as the ability to quickly add or convert beds and procedure rooms to manage critically injured patients for mass population events such as earthquakes, pandemics (influenza), or man-made biological/chemical exposure (bioterrorism, etc); and
  - Design facilities to maintain and further SUMC's role as a Level 1 Trauma Center for daily and extreme-disaster healthcare delivery.

[6] Translational Resources: To improve human health, scientific discoveries must be translated into practical applications. Such discoveries typically begin at "the bench" with basic research — in which scientists study disease at a molecular or cellular level — then progress to the clinical level, or the patient's "bedside." Scientists are increasingly aware that this bench-to-bedside approach to translational research is really a two-way street. Basic scientists provide clinicians with new tools for use in patients and for assessment of their impact, and clinical researchers make novel observations about the nature and progression of disease that often stimulate basic investigations. Source: SoM, April 2008.

- Maintain relationships with community physicians:
  - Identify replacement space for community physicians who must relocate their medical offices to accommodate demolition of facilities due to the SUMC Project.
- Provide responsible and sustainable design for the hospitals' operational systems, water systems, and use of physical materials, while meeting applicable requirements and hospital planning principles, including those applicable to infection control and patient safety.
- Allow sufficient design and entitlement flexibility to be able to adapt to changes in healthcare needs, changes in technology, and changes in delivery practices.

SoM Objectives. The Program objectives of the SoM are listed below.

- Optimize the SoM's ability to translate medical research discoveries into treatments and cures.
- Replace outmoded research buildings with state-of-the-art research facilities to support contemporary translational research:
  - Design facilities to comply with code requirements for strong and reliable fire separations;
  - Design research facilities to efficiently meet current building requirements, including those pertaining to: seismic safety; heating, ventilation, and air conditioning; mechanical, electrical, and plumbing (MEP) systems; and provision of emergency power;
  - Design circulation and access to laboratories and offices to enhance handicapped accessibility, and to allow for safe and efficient access to a diverse array of laboratory and support functions; and
  - Employ best available design techniques to provide for efficient, high quality facilities.
- Provide sufficient faculty offices, research laboratories, and administrative support space to meet the SoM's projected needs.
- Provide responsible and sustainable design for the SoM's operational systems, water systems, and use of physical materials, consistent with Stanford University's existing sustainability practices.
- Allow sufficient design and entitlement flexibility to be able to adapt to changes in medical research needs and changes in technology.

Siting Objectives

- Site facilities to maximize highest and best use of SUMC and Stanford University lands.
- Site SHC and LPCH facilities to efficiently use a single, shared ED.
- Locate patient beds, ED, and SoM facilities in close proximity to each other to maintain and enhance program synergies and connections.
- Locate outpatient healthcare facilities that are important to the core academic and translational discovery process in close proximity to inpatient facilities.

- Site parking facilities for patients and visitors to provide clear, safe, and convenient access to SUMC facilities, with sensitivity to the needs of elderly, limited mobility, and ill patients.
- Site parking facilities for staff with consideration of safe paths of travel after dark.
- Locate new clinical, medical office, and support facilities for hospital staff and community physicians within reasonably close proximity to SHC and LPCH facilities.
- Optimize department adjacencies that ensure the healthcare facilities are clinically safe environments, promote safe and efficient patient flow, and provide access to state-of-the-art technology.
- Use the existing SUMC Sites in Palo Alto for all components of the SUMC Project.
- Arrange the buildings, open space areas, and infrastructure within the SUMC Project boundaries to create a highly functional medical center environment.

Circulation and Parking Objectives

- Provide clear, safe, and convenient access to SUMC facilities for patients and visitors.
- Provide efficient access to SUMC for healthcare providers and staff.
- Provide sufficient convenient parking for patients, visitors, healthcare providers and staff, with sensitivity to the needs of elderly, limited mobility, and ill patients.
- Enhance the pedestrian and bicycle connections within and between the SUMC, the Stanford Shopping Center, PAITS, and nearby open space areas.
- Provide improved way finding to minimize unnecessary circulation.

Cost Objective

- Select methods of construction to minimize the initial cost to the greatest extent feasible while producing facilities that are cost effective to operate over the long term.

City Objectives

In addition to the SUMC Project sponsor's objectives, the City has identified the following objectives for the SUMC Project:

- Provide high quality employment districts, each with its own distinctive character and each contributing to the character of the City as a whole.
- Employ state-of-the-art urban design principles and ensure adequate design review of the SUMC Project.
- Create a more walkable, bikeable, mixed-use, transit-oriented, and well-connected urban environment that captures the potential travel behavior, air quality, and greenhouse gas reduction benefits associated with the performance of well-designed urban villages.

- Create walkable and bikeable connections that link together Stanford University Medical Center, Stanford University, PAITS, downtown, Stanford Shopping Center, and surrounding residential neighborhoods.
- Promote sustainable development and green building design principles through thoughtful urban planning and site design, building design and construction, energy production and conservation, and utility and transportation infrastructure design and construction, in a manner that improves the City's economic health, and improves the quality of life in the City.
- Promote development that contributes to the design and implementation of comprehensive solutions to traffic problems near Stanford Medical Center and key connections.
- Encourage employment districts to develop in a way that encourages transit, pedestrian and bicycle travel and reduces the number of auto trips for daily errands.
- In conjunction with new development proposals, create new park, open space, recreation, plaza, or other public gathering spaces.
- Provide for long-term utility and public infrastructure demands generated by the SUMC Project.
- Address project-induced school impacts not mitigated by school impact fees.
- Minimize environmental, financial, and municipal infrastructure impacts of the SUMC Project on the City.
- Assist Stanford University Medical Center in responding to changes in the delivery of healthcare services. Work with the SUMC to plan for changing facility needs, but within the context of City of Palo Alto planning goals and policies, as well as the goals and policies of other relevant jurisdictions.
- Support Stanford University's historic campus identity as "a place apart" with a "sense of higher purpose" as well as Stanford's commitment to innovative, high quality of design through their "interpretive approach to contextual design" in the architecture of campus buildings and the landscape.
- Identify and implement strategies for accomplishing housing with a focus on below-market-rate residential units that would be available to help accommodate employment generated by the SUMC Project.
- Locate work force housing close to SUMC Sites and train station in order to reduce traffic trips of both employees and employee household members.
- Encourage public and private upkeep and preservation of resources that have historic merit.
- Optimize delivery of healthcare and services to patients and meet regional needs for emergency and disaster preparedness.

2.4 EXISTING SETTING

Land Use and Zoning Designations

Most of the Main SUMC Site and all of the Hoover Pavilion Site are within the jurisdiction of the City of Palo Alto; however, a 0.75-acre area at the northwest corner of the Main SUMC Site, just west of Pasteur Drive, is located in unincorporated Santa Clara County. Figure 2-2 provides the existing land use designations for the SUMC Sites, per the *City of Palo Alto 1998 Comprehensive Plan* (Comprehensive Plan). As shown in the figure, most of the Main SUMC Site and all of the Hoover Pavilion Site are within the Major Institution/Special Facilities land use designation, which allows institutional, academic, governmental, and community service uses on lands that are either publicly owned or operated by non-profit organizations. The southeast corner of the Main SUMC Site plus a strip of land between Sand Hill Road and Welch Road are under the Comprehensive Plan's Research/Office Park designation, which allows office and research establishments, as well as educational institutions. The Research/Office Park designation also allows manufacturing establishments whose operations are buffered from adjacent residential uses.

Figure 2-3 provides the existing zoning designations of the Main SUMC Site and Hoover Pavilion Site per the City's 2007 Zoning Map. Most of the Main SUMC Site and all of the Hoover Pavilion Site are located within the Public Facilities (PF) zoning district. According to the City's Zoning Code, the PF district allows development of governmental, public utility, educational, and community service or recreational facilities. Conditional uses allowed in the PF district include eating and drinking services in conjunction with a permitted use; retail services as an accessory use to the administrative offices of a non-profit organization; retail services in conjunction with a permitted use; business or trade schools; churches and religious institutions; private education facilities; public or private colleges and universities and facilities appurtenant thereto; special education classes; administrative office services for non-profit organizations; community centers; utility facilities; neighborhood recreation services; outdoor recreation services; youth clubs, residential care facilities, when utilizing existing structures on the site; day care centers; art, dance, gymnastic, exercise or music studios or classes; medical services (hospital and outpatient medical facilities with associated medical research); temporary parking facilities; and airport and airport-related uses.[7] The PF-zoned area on the Main SUMC Site has an allowable floor area ratio (FAR) of 1.0. The PF-zoned Hoover Pavilion Site has an allowable FAR of 0.25.

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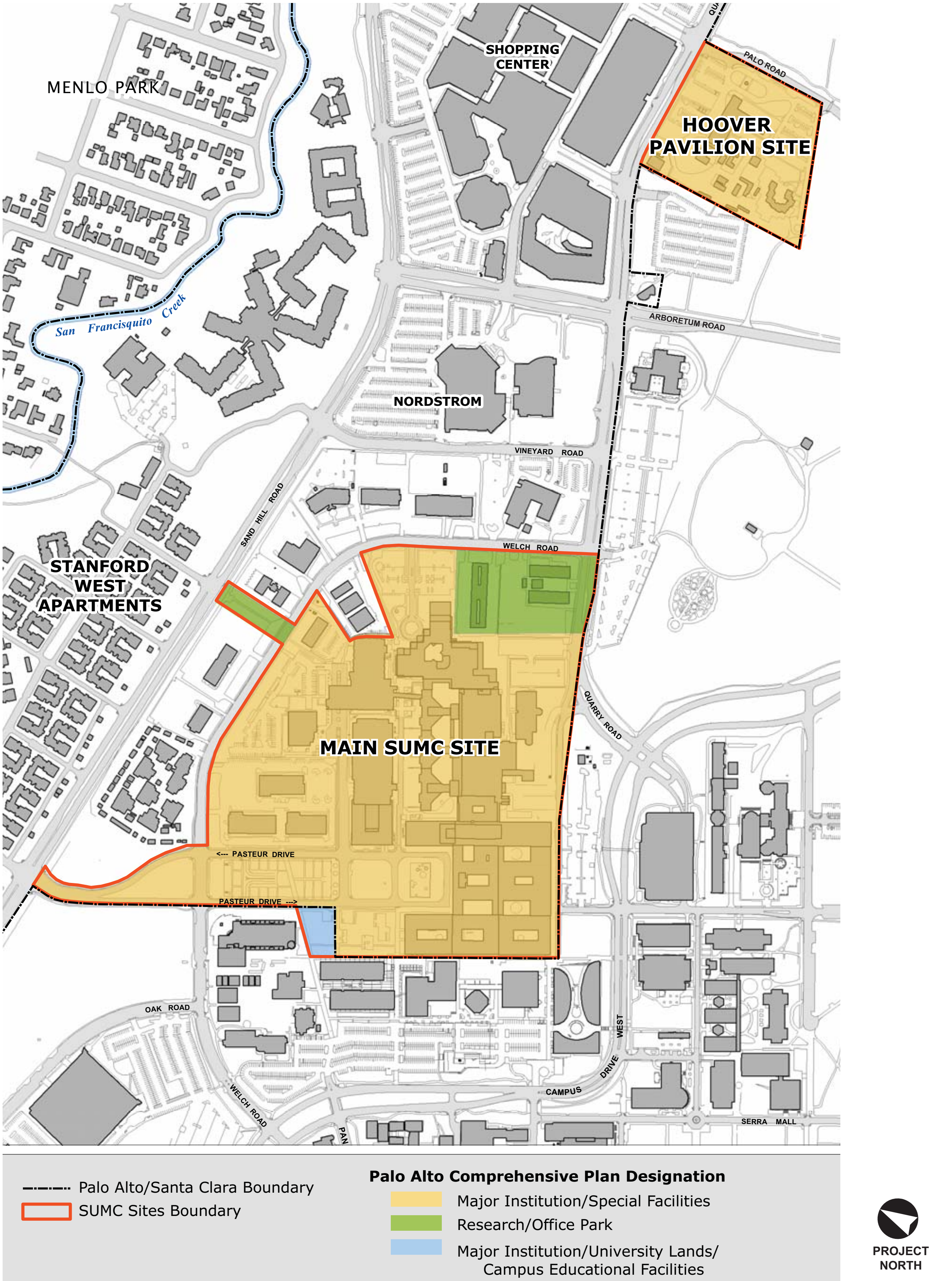
7 City of Palo Alto, *Palo Alto Zoning Code, Section 18.28.040, Land Uses,* http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=8708, accessed October 8, 2007.



***Source*:** PBS&J, 2009.

PBS&J

FIGURE 2-2
SUMC Sites Existing Comprehensive Plan Designations

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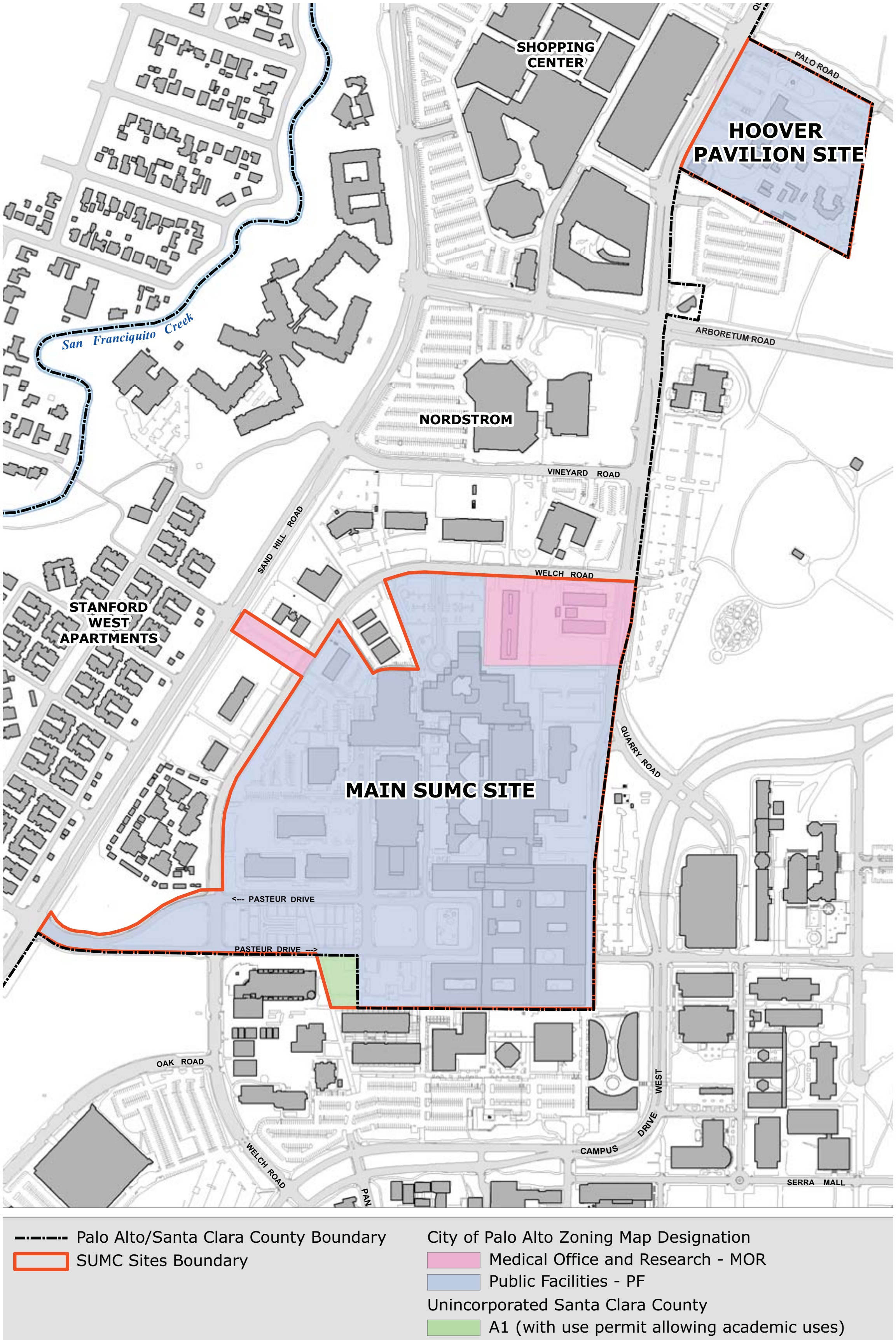
Stanford University Medical Center Facilities Renewal and Replacement Draft EIR



***Source*: PBS&J, 2009.**

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FIGURE 2-3
SUMC Sites Existing Zoning Designations

The southeast corner of the Main SUMC Site plus a strip of land between Sand Hill Road and Welch Road fall within the Medical Office and Research (MOR) district. The MOR district allows medical offices, medical research facilities, and some medical support services. Conditional uses allowed in the MOR district include ambulance services; convalescent facilities; research and development; utility facilities essential to provision of utility services, but excluding construction/storage yards, maintenance facilities, or corporation yards; neighborhood retail centers; multi-family residential; lodging - hotels providing not more than 10 percent of rooms with kitchens; and temporary parking facilities, provided that such facilities remain no more than five years.[8] The MOR-zoned area on the Main SUMC Site has an allowable FAR of 0.5.

A 0.75-acre area at the northwest corner of the Main SUMC Site, just west of Pasteur Drive, is located in unincorporated Santa Clara County. This area is designated as Major Institution/University Lands in the Comprehensive Plan, and falls within the A1 district in the County of Santa Clara Zoning Code. The A1 district is an agricultural district, but academic uses are conditionally permitted in the A-1 district and Stanford University has been granted a use permit allowing academic use of the site. Section 3.2, Land Use, provides further information on the land use and zoning designations within the Main SUMC Site and Hoover Pavilion Site.

The approximately 56-acre Main SUMC Site is comprised of Assessor Parcel Numbers (APNs) 142-03-008, 142-03-037, 142-23-003, 142-23-004, 142-23-005, 142-23-006, 142-23-007, 142-23-010, 142-23-012, 142-23-016, 142-23-017, 142-23-018, 142-23-019, 142-23-024, 142-23-025. Properties within the approximately 9.9-acre Hoover Pavilion Site include APNs 142-04-012, 142-04-011, and 142-04-10.

Leaseholds

Stanford University owns the land at the Main SUMC Site and at the Hoover Pavilion Site, although structures therein are owned and operated by SHC, LPCH, and Stanford University SoM. As such, Stanford University leases portions of the SUMC Sites to SHC and LPCH. Figure 2-4 depicts the leasehold boundaries of SHC and LPCH.

Site Development

Figure 2-5 provides the existing site layout for the Main SUMC Site and the Hoover Pavilion Site. The two sites combined are developed with approximately 2.37 million square feet of hospital, clinic/medical office, and medical research space (see Table 2-1). Of this developed space, approximately 2.27 million square feet are located within the Main SUMC Site and about 105,400 square feet are located within the Hoover Pavilion Site. Further details on existing development at the Main SUMC Site and Hoover Pavilion Site are provided in the subheadings below.

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8 City of Palo Alto, *Palo Alto Zoning Code, Section 18.20.030, Land Uses,* http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=8703, accessed October 8, 2007.

Source: PBS&J, 2009.

PBS&J

FIGURE 2-4
SUMC Sites Leaseholds

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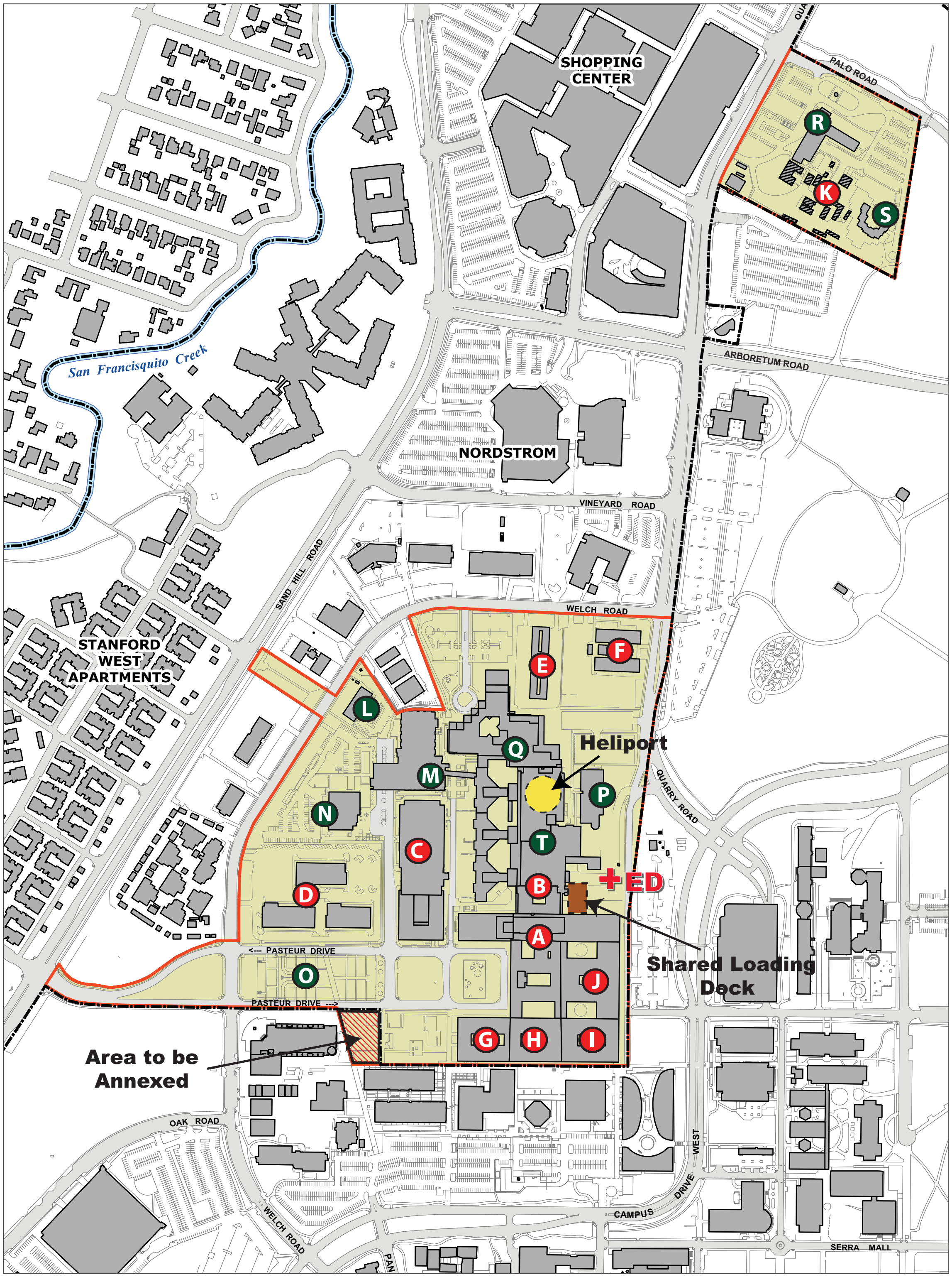

Palo Alto/Santa Clara County Boundary
SUMC Sites Boundary
Building Demolition
Buildings to be Retained

A. 1959 Hospital Buildings (East, West, Core, Boswell)
B. Core Expansion (1973)
C. Parking Structure 3
D. 1101 Welch Road
E. 703 Welch Road
F. 701 Welch Road
G. Edwards Building
H. Lane Building
I. Alway Building
J. Grant Building
K. Hoover Sheds & Storages
L. 801 Welch Road
M. Advanced Medicine Center
N. Blake-Wilbur Clinic
O. Parking IV (underground)
P. Cardiovascular Research Center
Q. L. Packard Children's Hospital
R. Hoover Pavilion
S. Arboretum Children's Center
T. Hospital Modernization Project

PROJECT NORTH

Source: PBS&J, 2009.

PBS&J

FIGURE 2-5
SUMC Sites - Existing Site Layout

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Table 2-1
Existing Floor Area Within SUMC Sites

Building	Use	Floor Area (square feet)	Proposed for Demolition
SHC – Main SUMC Site			
1959 Hospital Building complex[a]	Hospital	133,025	Yes
Core Expansion	Hospital	223,850	Yes
Hospital Modernization Project	Hospital	431,280	No
Entry	Hospital	77	Yes
1959 Hospital Building complex[a]	Clinic/Medical Office	308,176	Yes
Blake-Wilbur Clinic	Clinic/Medical Office	73,100	No
Advanced Medicine Center	Clinic/Medical Office	224,836	No
Subtotal SHC		*1,394,344*	
Other– Main SUMC Site			
801 Welch Road	Clinic/Medical Office	12,671	No
1101 Welch Road	Clinic/Medical Office	40,100	Yes[b]
701 Welch Road	Clinic/Medical Office	56,300	Yes[c]
703 Welch Road	Clinic/Medical Office	23,500	Yes[c]
Subtotal Other		*132,571*	
Hoover Pavilion Site			
Hoover Pavilion—main building	Clinic/Medical Office	84,230	No
Hoover Pavilion—misc. on-site	Shops/Storage	13,831	Yes
Arboretum Children's Center	Childcare	7,375	No
Subtotal Hoover Pavilion Site		*105,436*	
LPCH – Main SUMC Site			
LPCH—main hospital	Hospital	274,700	No
Subtotal LPCH		*274,700*	
SoM – Main SUMC Site			
1959 Hospital Building complex			
Lane	Research	112,480	Yes
Grant	Research	151,982	Yes
Alway	Research	84,717	Yes
Edwards	Research	65,798	Yes
Falk Building	Research	52,226	No
Subtotal SoM		*467,203*	
TOTAL SUMC SITES		2,374,254	
Main SUMC Site		2,268,818	
Hoover Pavilion Site		105,436	

Source: SUMC, 2010.

Notes:

a. The SHC portion of the 1959 Hospital Building complex includes the East, West, Core, and Boswell buildings, which together are used for both hospital and clinic purposes. This table identifies the square footages used for each use.

b. To be replaced by replacement SHC facilities.

c. To be replaced by expanded LPCH facilities.

In terms of site usage, the total impervious area within the SUMC Sites is about 49 acres or about 70 percent of the total site area. Approximately 19 acres within the SUMC Sites, or about 27 percent of the total site area, consists of pervious (landscaped) area with an additional 2 acres of planted rooftops (about 3 percent of the SUMC Sites).[9] Impervious areas within the SUMC Sites include roadways, building footprints, parking lots, and paved pathways.

Main SUMC Site. There are several structures, including three parking garages, at the Main SUMC Site; occupiable structures are listed in Table 2-1. Collectively, the occupiable structures comprise approximately 2.27 million square feet. Of the 2.27 million square feet within the Main SUMC Site, about 1.39 million square feet are used by SHC for hospital purposes; about 274,700 square feet are used by LPCH for hospital and clinic purposes; about 467,200 square feet are used by SoM; and about 132,600 square feet are jointly used by the hospitals and community practitioners (1101, 801, 701, and 703 Welch Road), as shown in Table 2-1. Table 2-1 also indicates which of the existing structures are proposed for demolition under the SUMC Project. Table 2-5 depicts which existing structures would be demolished and retained. The existing building footprints cover about 29 percent (about 686,000 square feet or 15 acres) of the Main SUMC Site.

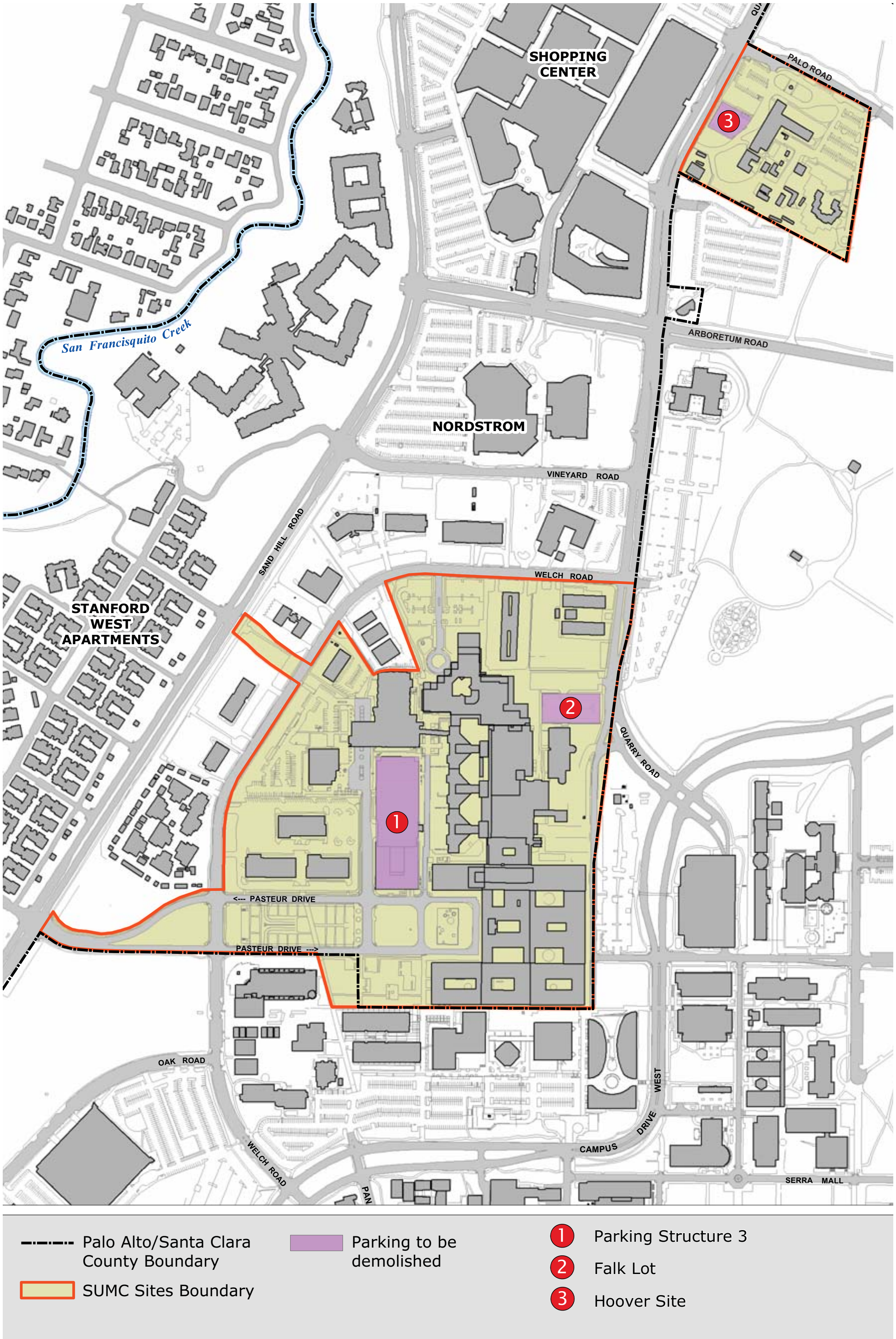
Structures within the Main SUMC Site vary in height from approximately 15 feet to approximately 50 feet. Building heights do not include the height of roof-mounted mechanical equipment (e.g., heating and cooling units, vents, etc.).

Parking at the Main SUMC Site is provided in surface lots, an above-ground garage, and underground garages. The on-site parking facilities that would be demolished by the SUMC Project are Parking Structure 3 to the east of Pasteur Drive and the Falk surface parking lot north of Quarry Road (see Figure 2-6). As shown in Table 2-2, Parking Structure 3 contains 699 spaces, 671 of which are needed to meet current demand based on recent surveys. The Falk lot contains 130 spaces, 115 of which are needed to meet current demand. Thus, the Main SUMC Site's parking facilities to be demolished include a total of 829 spaces, 786 of which are needed to meet current demand.[10]

Hoover Pavilion Site. The existing site layout for the Hoover Pavilion Site is provided in Figure 2-5. The Hoover Pavilion Site contains approximately 84,200 square feet within the Hoover Pavilion building, approximately 7,400 square feet within the Arboretum Children's Center, and approximately 13,800 square feet of miscellaneous shops and storage outside of the Hoover Pavilion building. With the exception of shops and storage space and the Children's Center, most of the existing floor area is dedicated to medical offices and clinics. The allowed FAR at this site is 0.25 and the existing structures cover about 9 percent of the site (Maximum Site Coverage of 0.09). Existing building heights within the Hoover Pavilion Site range from approximately 12 feet to 65 feet. Building heights do not include the height of roof-mounted mechanical equipment (e.g., heating and cooling units, vents, etc.).

9 Total pervious versus impervious area is extracted from the SUMC Project application and does not exactly correspond to the total 66-acre combined area of both SUMC Sites because sources for the acreages differ. However, the sum of the pervious versus impervious area is 70 acres, which is approximate to the 66-acre combined area of both SUMC Sites.

10 Fehr and Peers, SUMC Trip Generation and Parking Demand Study, October 2008.



Source: PBS&J, 2009.

PBS&J

FIGURE 2-6
SUMC Sites Existing Parking Facilities to be Demolished

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Table 2-2 Existing Parking Supply within Facilities to be Demolished at SUMC Sites		
Parking Facility To Be Affected	**Number of Total Spaces**	**Number of Occupied Spaces to be Demolished**
Main SUMC Site		
Parking Structure 3	699 (all to be removed)	671
Falk Lot 5	130 (all to be removed)	115
Hoover Pavilion Site		
Lot 1A	273 (139 spaces to be removed)	85
TOTAL SPACES	**1,102**	**871**

Source: SUMC, 2008.

Parking at the Hoover Pavilion Site is provided in Lot 1A, a surface parking lot that surrounds the Hoover Pavilion building. As shown in Table 2-2, Lot 1A contains 273 spaces, of which 85 surface parking spaces are needed to meet current demand.

Site Activity

The Palo Alto-Stanford Hospital was founded in 1959 as a community hospital and teaching hospital. Today, the SUMC comprises two hospitals, the Stanford Hospital (operated by SHC) and the LPCH. Some of the SoM's educational and research facilities also occupy the SUMC. The SHC is a Level 1 Trauma Center[11] that serves the counties of Santa Clara, San Benito, San Mateo (southern portion), Santa Cruz, and Monterey. The LPCH, just east of the Stanford Hospital, is an inpatient hospital that focuses on care for babies, children, adolescents, and expectant mothers; this facility primarily serves San Mateo and Santa Clara Counties.[12] The Stanford University SoM provides medical education, and performs research to advance the knowledge and practice of medicine.

Patient Visits. The SHC is licensed by the State of California to operate 613 beds, but is currently operating at a 456-bed level. The SHC estimates about 403,885 outpatient visits occurred at its clinic/facilities in 2006. In the same year, the SHC experienced 22,914 inpatient discharges and 132,182 inpatient days.[13] The average daily census, a daily average of occupied inpatient beds, was approximately 362 for the SHC (approximately 80 percent of total capacity).

11 A Level 1 trauma center has a full range of specialists and equipment available 24-hours a day and admits a minimum required annual volume of severely injured patients. Additionally, a Level 1 center has a program of research, is a leader in trauma education and injury prevention, and is a referral resource for communities in neighboring regions (community outreach). Level 1 trauma centers also participate in the Trauma System as part of organized disaster response efforts. A Trauma System is an inclusive, regionalized coordinated effort organized to deliver the full range of care to all injured patients. Trauma systems are integrated within the local EMS system. Source: SUMC, 2008.

12 LPCH, http://www.lpch.org/aboutus/community/ourCommunity.html, accessed October 13, 2007.

13 Inpatient days refer to the total number of days that beds were filled for the year.

The LPCH is licensed to operate 257 beds on the campus. When the SUMC Project application was filed, the LPCH was operating 218 beds on the campus, but had received approvals for and commenced construction of an interior renovation project to add 39 beds. LPCH is now operating all 257 beds. The LPCH estimates that it received 107,363 outpatient visits to its clinic facilities in 2006. In the same year, the LPCH experienced 11,889 inpatient discharges and 70,752 inpatient days. The average daily census was approximately 194 (approximately 89 percent of total 2006 capacity).

Students. In the fiscal year 2006-2007, the SoM estimates that a total of 506 students worked within the Main SUMC Site. All students on and off campus, including those working in buildings in Santa Clara County, totaled 2,214. About half of the students associated with the SoM are paid interns and residents, and are thus part of the overall SHC/LPCH medical staff. Thus, a portion of the SoM students are also reflected in the SHC/LPCH employment data presented below.

Employment. Currently, the SHC, LPCH, and SoM employ 9,729 individuals within the SUMC Sites (both Main SUMC Site and Hoover Pavilion Site). Employment is broken into 5,240 SHC employees, 1,666 LPCH employees, and 2,823 SoM employees.[14] Also, non-SUMC providers occupy space within the SUMC Sites; 151 employees associated with these non-SUMC providers are included in the overall employment count.[15] The 2,823 SoM employees include 911 faculty members, 1,406 academic and administration staff, and 506 students (paid interns and residents).

It should be noted that employees at the hospitals work in shifts, including the 7:00 a.m. to 7:00 p.m. day shift, the 3:00 p.m. to 11:00 p.m. evening shift, and the 7:00 p.m. to 7:00 a.m. night shift. Consequently, the number of employees present at any one time within the two hospitals is less than the total 5,240 for the SHC and 1,666 for the LPCH. As such, in the traffic analysis provided in Section 3.4 of this document, the basis for determining the daily trips from the hospitals is driveway and parking counts, rather than employment.

Ambulance and Helicopter Trips. As shown in Figure 2-5, one ED and one heliport serve the two hospitals. The ED, where ambulance trips to and from the site converge, is located at the south side of the Hospital Core Expansion building, off Quarry Road. Most ambulance trips end at the SHC emergency ward near the terminus of Quarry Road. In 2006, there were 8,334 ground ambulance trips (an average of 23 trips per day) associated with SUMC activities.[16] The total ambulance trips comprise 19.6 percent of the total 42,522 ED visits for that year.

The existing helicopter landing pad (heliport) and adjacent helicopter parking area are located on top of the SHC Hospital building. The heliport is designed to accommodate one helicopter at a time, and can accommodate a helicopter 57 feet long and 12,000 pounds. There are two spaces for helicopters to be parked adjacent to the heliport. In 2006, there were 2,120 helicopter trips[17] for an average of six trips per day. These trips are associated with LifeFlight Patient Transportation as well as other agencies/helicopters that are certified to use the SUMC heliport. All helicopter trip flight plans comply

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14 Estimates of existing employment at SHC and LPCH are based on correspondence between the SUMC Project sponsors and Keyser Marston Associates (February 2008), and estimates of SoM employment are based on the SUMC Application, August 2007, as amended.

15 Estimated by KMA at 350 square feet per employee.

16 Roundtrip, includes arrival and departure.

17 Trip = arrival or departure

with Federal Aviation Administration and Caltrans Division of Aeronautics regulations. Fueling is conducted at the Palo Alto Municipal Airport, roughly 3.6 miles east of the SUMC Sites, and about half of the 2,120 total annual helicopter trips are associated with fueling.[18] Most maintenance is performed on-site at the helicopter parking area adjacent to the pad. Five to six times each year, a helicopter may travel to Moffett Field for more extensive maintenance work. All maintenance trips also are included in the 2,120 total helicopter trips. SHC holds the current Heliport Permit issued by the Caltrans Division of Aeronautics.

Loading and Deliveries. One shared loading dock serves SHC and LPCH on the Main SUMC Site along Quarry Road (see Figure 2-5). SoM does not have a loading dock on the Main SUMC Site. In 2006, there were approximately 32,850 annual deliveries (an average of 105 deliveries per day over six days per week) at the SUMC. Of this total, it is estimated that SHC accounted for 24,638 (75 percent) of the deliveries while LPCH accounted for 8,212 (25 percent) of the deliveries. The percentage of average daily trips per vehicle type is provided in Table 2-3.

Table 2-3
Existing Loading Trips per Vehicle Type

Vehicle Type	Number of Average Daily Trips	Percentage of Trips
Tractor Trailers (53 feet long)	26	25
Box Trucks/Cab-Overs (18 to 48 feet long)	32	30
Parcel Delivery Vehicles (10 to 18 feet long)	21	20
Courier Vans/Trucks (10 to 18 feet long)	26	25
TOTAL	**105**	**100**

Source: SUMC, 2010.

Mechanical Equipment

Major mechanical equipment used within the SUMC Sites includes Stanford's Central Energy Facility (CEF), 12 operating emergency diesel-powered generators (plus an extra generator on stand-by as required by OSHPD), and rooftop mechanical equipment. The CEF is roughly 800 feet west of the Main SUMC Site, on a portion of the Stanford University campus that is within unincorporated Santa Clara County. The CEF provides steam, chilled water, and backup power supply in the event of loss of power from the City of Palo Alto. The 12 emergency generators at the SUMC Sites have a total capacity of 9.4 megawatts. The four generators serving SHC and LPCH are located just south of the Main SUMC Site, south of Quarry Road. Rooftop equipment primarily includes electrical fans. The other eight emergency generators at the SUMC serve: the Falk building; the Advanced Medicine Center; the Blake-Wilbur Clinic; Parking Structure 4; 701 Welch Road; the Grant building; Alway, Lane, and Edwards buildings (along with the Fairchild building, which is located in Santa Clara County); and the Hoover Pavilion.[19]

[18] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5.
[19] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6.

The City of Palo Alto provides power, domestic water, fire water, sanitary sewer, storm sewer, natural gas, and solid waste disposal. Section 3.15, Utilities, further discusses utility services.

2.5 CHANGES PROPOSED UNDER THE SUMC PROJECT[20]

Background

Seismic Safety. Several existing buildings at the SUMC Sites require structural retrofit or replacement to comply with health and safety codes, particularly California Senate Bill (SB) 1953, Safety Retrofitting. SB 1953 requires hospitals to retrofit or replace facilities that do not meet State-designated safety criteria. In addition, many of the facilities within SHC and LPCH require nonstructural renovations or replacement. Hospitals have the option of replacing or retrofitting designated non-compliant facilities to meet a January 1, 2013 deadline.[21] Further requirements must be met by 2030. If a hospital does not comply with these mandates, the State can revoke the hospital's operating license. The Stanford Hospital, composed of buildings built between 1959, 1973, and 1989, does not meet the 2013 and 2030 safety requirements; therefore, significant portions of its facilities must be replaced or renovated. The SUMC Project sponsors have determined that in many cases it is more cost efficient and physically practical to demolish older, non-compliant buildings and to replace them with new facilities. The 1959 Hospital Building complex, comprising 188 beds, must be replaced in its entirety. All 66 intensive care beds, the ED, and the 21 operating rooms at Stanford Hospital do not meet 2013 non-structural criteria, and it is more efficient for the SHC to replace these facilities than to retrofit them.

The LPCH facility meets the structural performance criteria for the 2030 deadline under SB 1953, but significant non-structural renovations to critical care areas are required by the 2013 deadline. In order to accomplish these renovations, LPCH needs replacement space for patients and families during construction.

In addition, the portions of the SoM that occupy the 1959 Hospital Building complex must either be physically separated from structures used for hospital purposes, or replaced, in order to comply with SB 1953 requirements. The SUMC Project sponsors propose to demolish and replace the SoM buildings occupying the 1959 Hospital Building complex.

New or replacement hospital structures must meet standards specified by California's building code for hospitals. Compared with the existing hospital buildings at the SUMC, compliance with these standards necessitates increased square footage and height to accommodate seismic structural requirements, air handling systems, and mechanical duct work.

[20] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended.

[21] SHC has applied for the maximum two-year extension of the 2013 deadline provided by law. However, the extension is contingent upon meeting specified interim milestones, which cannot be met until construction is allowed to commence.

Spatial Constraints. The SHC is currently licensed to operate 613 inpatient beds; however, with current spatial constraints, it is only able to keep 456 beds operational. Spatial constraints restrict the SUMC's ability to serve new patients and expansions needed to provide the optimal level of care for existing patients. In fiscal year 2005, SHC had to turn away 500 adult patients because of a shortage of beds. Furthermore, due to an aging population, along with modest overall projected population growth in the surrounding community, the number of patients turned away will increase unless additional patient beds are provided. With implementation of the SUMC Project, the SHC would strive to maintain 600 operational beds.

The LPCH is licensed to operate 257 beds, and all 257 beds are currently in use. The LPCH has an acute shortage of beds. In fiscal year 2005, the hospital was forced to turn away 200 critically ill children due to lack of beds. Similar to the SHC, modest population growth is expected to increase the number of children turned away unless additional patient rooms are provided. With implementation of the SUMC Project, the LPCH would seek to increase its licensed inpatient beds to 361.

SHC and LPCH both suffer from an outmoded ratio of semi-private patient rooms to single-bed patient rooms. Approximately 60 percent of the patient beds at the SHC and LPCH are semi-private, yet the American Academy of Healthcare Architects recommends that all beds be in private rooms to ensure patient safety, privacy, and family centered care.[22] Currently, most SUMC rooms have two beds, but some rooms have three to four beds. Expansions thus need to be made for adequate space to provide sufficient beds and to meet current standards for bed and room provisions.

Outpatient Treatment. The SHC and LPCH current outpatient facilities (as well as administrative functions) are located on campus and at off-site locations. In order to accommodate the growing demand for outpatient services, the SHC needs to increase outpatient treatment areas off campus and over time on campus. There has been a relative shift of therapies and treatments to the outpatient setting due to advances in medical delivery technologies and the ability to treat and manage patients with chronic conditions (asthma, cardiac conditions, etc.) as outpatients. This trend continues to grow as advances in medical technology allow for life-saving procedures such as heart and lung transplants, which often require monitoring and treatment of complications over time. To address this issue, the hospitals propose to construct approximately 479,000 square feet of new and replacement clinics on the Main SUMC Site (for a net increase of 50,924 square feet), as well as renovate the existing Hoover Pavilion building for use as clinics and medical offices. Further, the hospitals propose approximately 60,000 square feet of medical office/clinics for community practitioners and SUMC uses at the Hoover Pavilion Site.

Modernization of Research Facilities. SoM proposes to replace, but not increase, its existing facilities in the 1959 Hospital Building complex to address seismic safety requirements and to bring the current facilities up to current industry standards for similar research facilities. To meet current industry standards, the research facilities of the SoM would need to provide (1) stronger and more reliable fire separations between laboratory and office areas, (2) greater volume of air for laboratory heating, ventilation, and air conditioning (HVAC) systems, and (3) increased ADA accessibility and

22 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 3.

enhanced support functions (e.g., tissue culture rooms, equipment rooms and computational facilities) in laboratories.

Entitlements

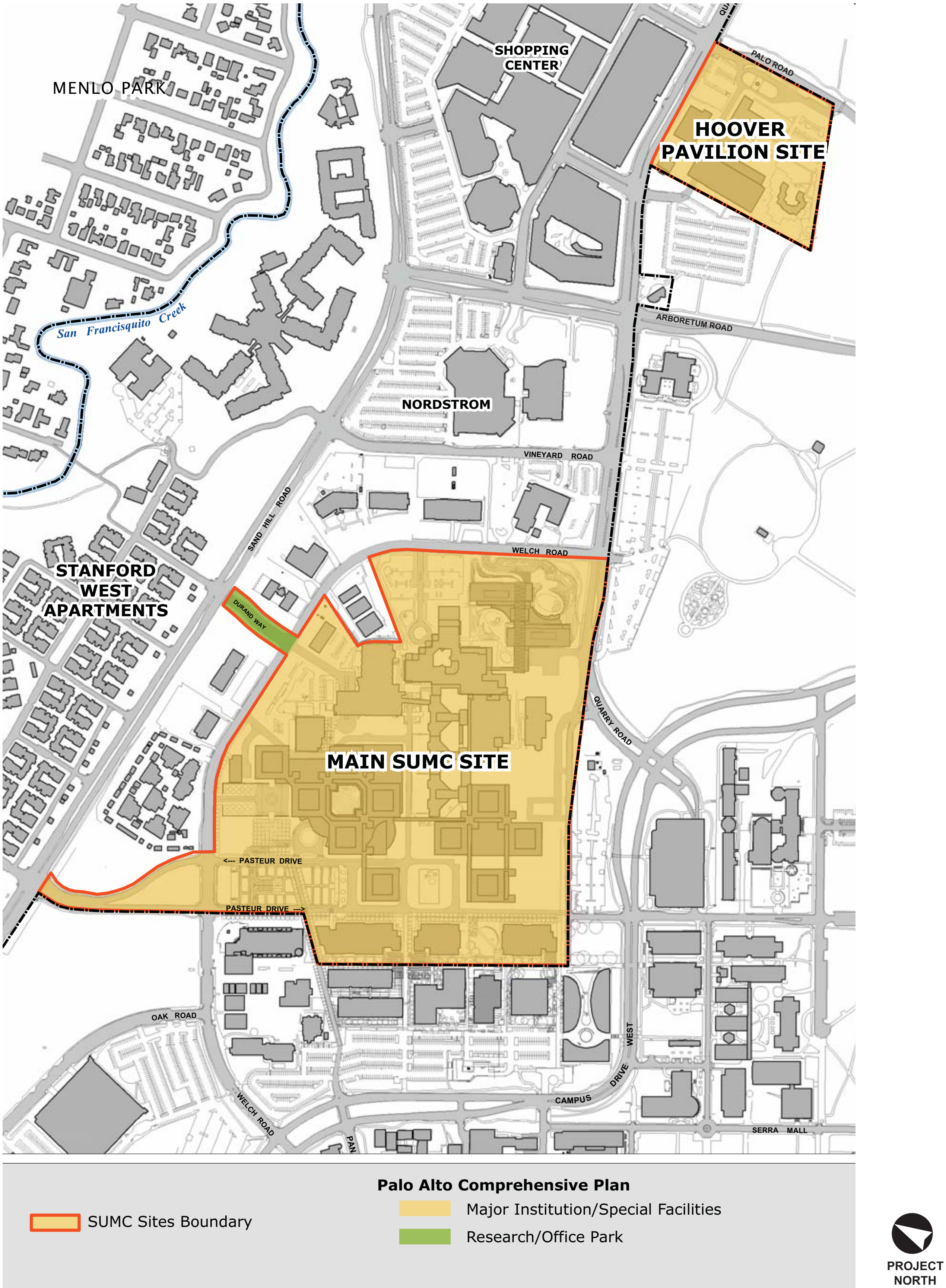
Changes to Comprehensive Plan. Existing Comprehensive Plan land use designations are provided in Figure 2-2. The SUMC Project sponsors have requested the following changes in land use designations at several locations identified in the City's Comprehensive Plan. The resultant land use designations are depicted in Figure 2-7.

- Change in land use designations at 701 and 703 Welch Road from the Research/Office Park land use designation to the Major Institution/Special Facilities land use designation.
- Annexation to Palo Alto of a 0.75-acre property within Santa Clara County jurisdiction with a Major Institution/Special Facilities land use designation to be applied to this property.

In addition, the SUMC Project sponsors have proposed changing the text associated with Program L-3 of the Comprehensive Plan. Program L-3 states that the City will maintain and periodically review height and density limits to discourage single uses that are inappropriate in size and scale to the surrounding uses. The discussion following Program L-3 refers to the City's historic 50-foot height limit. As proposed, some portions of the SUMC Project would exceed the current limit by approximately 80 feet. Accordingly, the SUMC Project sponsors propose that, in the event the SUMC Project is approved, the applicable Comprehensive Plan language be modified to identify the hospital zone as an exception to the 50-foot citywide limit due to the Medical Center's unique needs.

The City of Palo Alto staff has proposed an additional change to the Comprehensive Plan to clarify Policy L-8. Policy L-8 directs the City to maintain a limit of 3,257,900 square feet of new non-residential development within nine planning areas evaluated in a 1989 Citywide Land Use and Transportation Study. On a citywide basis, there is 1,944,090 square feet of development potential remaining under the Comprehensive Plan policy. However, non-residential development in the planning area in which a portion of the SUMC is located (Planning Area 9) has exceeded the anticipated growth for that area. However, as discussed further in Section 3.2, Land Use, City staff has suggested a modification of the text of this policy to specify that it is not meant to apply to hospital and treatment center uses.

Changes to Zoning Map and Ordinance. Existing zoning designations are provided in Figure 2-3. The SUMC Project sponsors have proposed zoning changes to all of the Main SUMC Site (with the exception of the footprint of Durand Way) and all of the Hoover Pavilion Site. The SUMC Project sponsors propose creation of a new zoning district that could be applied by the City to land uses specifically for hospitals, associated medical research, medical office, and support uses. The new zoning district would have its own name, such as "Hospital District," and would include development standards that accommodate hospital-related uses like the SUMC Project. The proposed boundaries of



Source: PBS&J, 2009.

PBS&J

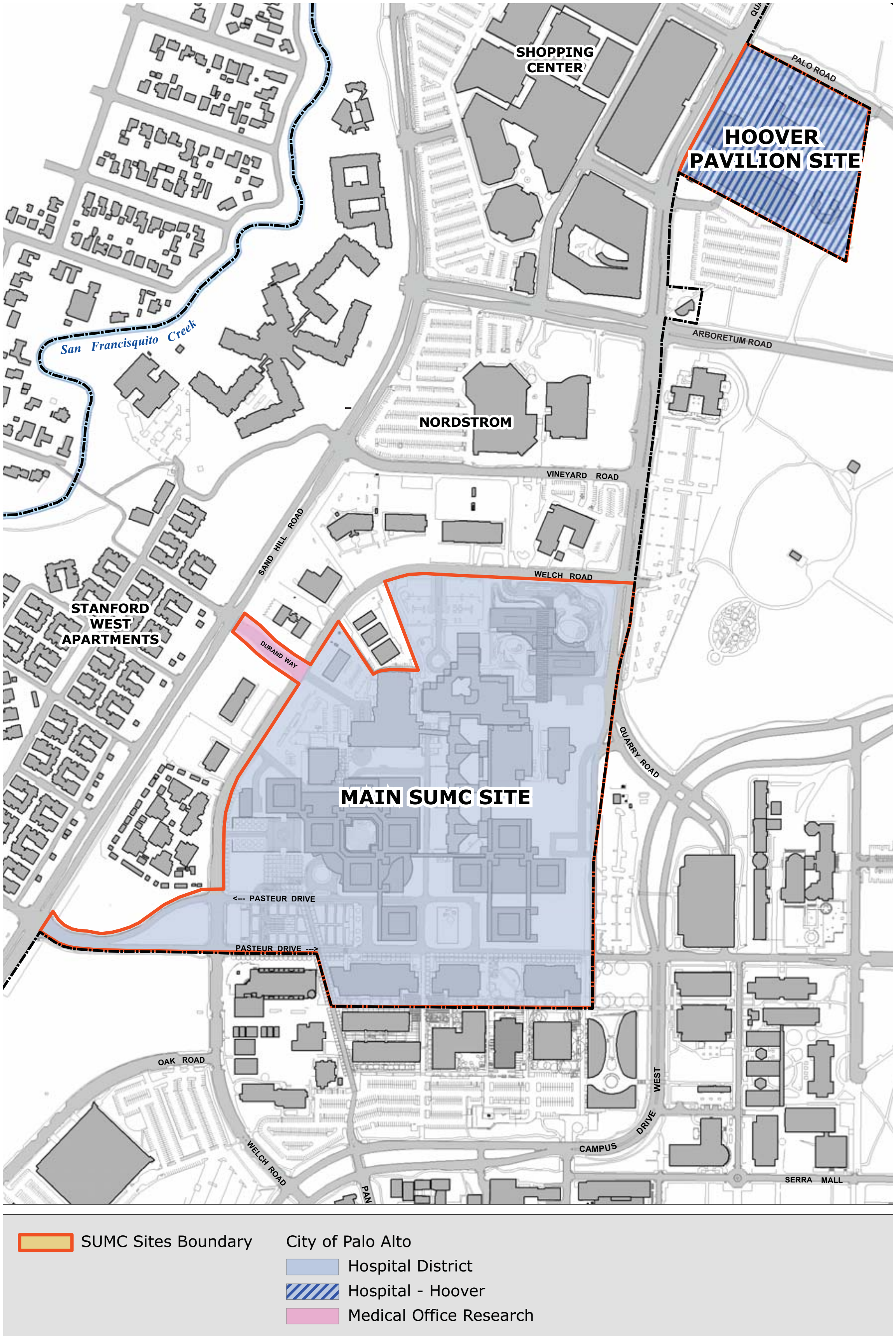
FIGURE 2-7
SUMC Project Proposed Land Use Designations

the new district are depicted in Figure 2-8. Specifically, the SUMC Project sponsors have identified the following proposed standards for this new Hospital District.

- The new zoning district would have its own name, such as "Hospital District" or "Public Facilities/Hospital District."

Permitted uses would include: private educational facilities; private universities; hospitals; outpatient medical facilities; medical research; medical offices; medical support services; retail services in conjunction with a permitted use; eating and drinking services in conjunction with a permitted use; and accessory facilities and activities customarily associated with or essential to permitted uses, and operated incidental to the principal use.

- As long as proposed uses are consistent with the zoning requirements, projects developed on these sites would be subject to Architectural Review and approval, but would not require a conditional use permit.
- The maximum FAR for the area for the Main SUMC Site would be 1.5 to 1. FAR would be calculated based on the total contiguous area within this zone, rather than on a parcel by parcel basis. The maximum FAR for the Hoover Pavilion Site would be 0.5 to 1. Rooftop, basement, interstitial space, and interior areas used to enclose mechanical equipment would be excluded from floor area calculations.
- The maximum site coverage for the inboard Welch Road area would be 40 percent of the site area. The maximum site coverage for the Hoover Pavilion Site would remain at 30 percent. Parking facilities would not be counted in determining site coverage. Site coverage would be calculated based on the total contiguous area within this zone, rather than on a parcel by parcel basis.
- The maximum height on the Main SUMC Site would be 130 feet and the maximum height on the Hoover Pavilion Site would be 60 feet (for new structures). Helicopter pads on top of buildings would be excluded from height calculations.
- No yard adjoining a street would be less than 10 feet, measured from the curb to the base of the buildings and not including any awnings or other projections. This setback requirement would not apply to below-grade parking facilities or portions of buildings that bridge a street.
- No standards would be specified for the site area, including width or depth.
- Regulations governing accessory facilities and uses, and the application of site development regulations in specific instances would be established by Chapter 18.42.
- Parking requirements would be performance-based, as established during review of project design. Parking would be provided to meet projected needs, with consideration given to the potential for reduced parking demand due to the proximity of the PAITS.



Source: PBS&J, 2009.

PBS&J

FIGURE 2-8
SUMC Project Proposed Zoning Designations

Prior to annexation, the 0.75-acre area to be annexed would first need to be pre-zoned to be consistent with the rest of the Main SUMC Site.

Development Agreement. A Development Agreement would be approved as part of the SUMC Project if the terms of such an agreement could be mutually agreed upon. The terms proposed by the City to be included in the Development Agreement are as follows:

- Establishment of two new programs for the exclusive benefit of residents: a $3 million fund to assist qualified low-income residents and a $4 million fund to subsidize community health programs within Palo Alto.
- Construction spending and associated use taxes of $8.3 million and provisions to obtain a use tax direct payment permit that would generate approximately $26,000 annually.
- Purchase of Caltrain GO Passes (TDM measure) for all SUMC employees at an estimated annual cost of $1.3 million (currently, only Stanford University employees are entitled to this benefit).
- Expansion of the Marguerite service by purchasing additional shuttles in the amount of $2 million and by funding additional annual operating costs of $450,000.
- Funding a range of improvements to encourage use of transit and enhance bicycle and pedestrian connections between the hospitals and downtown: $2.25 million for bicycle and pedestrian connections are PAITS; $400,000 for right-of-way improvements along Quarry Road; and $700,000 for a pedestrian connection between the SUMC and the Stanford Shopping Center (the Stanford Barn area).
- Payment of housing in-lieu fees in the amount of $23.1 million, which is equivalent to what a commercial project would pay.

Agreement terms will be developed and negotiated following the release of the Draft EIR review process, and the City Council and the public will be provided additional opportunities to comment in detail on both the high-level community benefit priorities as well as the specific deal terms. Supplemental Development Agreement Terms include:

- Healthcare:
  - Extend financial assistance subsidy to qualifying residents ($3 million) form 10 years to life of Development Agreement.
  - Extend community health programs payment ($4 million) from 10 years to life of Development Agreement.
  - Continue appropriate hospital privileges for community practitioners.
  - Continue SUMC's current community health/wellness/disease prevention programs.

- Fund co-located Emergency Operations Center (EOC) facility in new buildings within Palo Alto.
- Explore innovative healthcare initiative/partnership in area of broadband/fiber to the premises.

- Fiscal:
  - Ensure that the SUMC Project is at least cost neutral by guaranteeing revenue projections to offset expenditures, funding extra public safety Fulltime Equivalent's (FTE's), and fully funding mitigations.
  - Payment in lieu of property tax.
- Transportation: Explore re-defining TDM program (Caltrain GO Pass) and re-directing funds toward expanded shuttle program and other Citywide infrastructure improvements.
- Pedestrian and Bicycle Linkages Benefit: These items are covered as SUMC Project mitigations and explained in more detail throughout the document.
- Housing Benefit: The Hospital District would include additional measures to address the impact on the City's jobs to employed residents ratio, as identified in Section 3.13, Population and Housing.
- School Fees Benefit (Palo Alto Unified School District [PAUSD]): Work with the PAUSD and the City to minimize impacts to schools.
- Economic and Community Vitality: Contribute $30 million to help fund needed Citywide infrastructure such as a Public Safety Building, EOC, roadways, and expanded shuttle programs.

However, it is not anticipated that the Development Agreement would result in physical environmental impacts beyond those disclosed in this EIR for the SUMC Project. As such, the Development Agreement component of the SUMC Project is not discussed further in this document.

Other City Approvals. The SUMC Project sponsors have requested the following permits or approvals in addition to changes to the Comprehensive Plan and zoning ordinance.

- Annexation of the 0.75-acre site shown on Figure 2-5.
- Architectural Review.
- The zoning ordinance proposed for this district by the City includes an Inclusionary Housing requirement. This component of the zoning ordinance is analyzed in the Village Concept Alternative, Section 5, Alternatives, of this document.
- Regulations in this district would include applicability, preservation, and exemptions for removal and replacement of Protected Trees. The Hospital District would create a procedure to permit the removal of approximately 48 Protected Trees while preserving approximately 23 Protected Trees that are considered both biologically and aesthetically significant. The existing Protected Trees that are considered both biologically and aesthetically significant are discussed

in more detail in Section 3.9, Biological Resources, and Section 5, Alternatives. The Hospital District ordinance would include provisions for an applicable timeline (development vs. non-development) and for specific Protected Tree retention and preservation through development standards and regulations. Some Protected Trees that qualified for exemption to the regulations could be removed, providing that they are replaced per the City Tree Technical Manual (TTM) standards (TTM, Section 3.00). In addition, the Hospital District ordinance would require a minor amendment to the Tree Ordinance (Palo Alto Municipal Code Section 8.10) to recognize and cross-reference with the Hospital District ordinance.[23]

- The City of Palo Alto, in collaboration with Stanford University, SHC, and LPCH, prepared the SUMC Area Plan Update in 2007, as specified by the City's Comprehensive Plan Program L-46, which would be accepted by the City Council during the entitlement review of the SUMC Project.
- While the SUMC Project sponsors have requested that the SUMC Project components be deemed to be "permitted uses" under the proposed new Hospital District, it is possible that the City would only make these uses conditionally permitted. In that event, contrary to the proposal of the SUMC Project sponsors, the SUMC Project would also require one or more conditional use permits from the City.

Development Program

Hospital, Medical Office, and Medical Research Uses. The SUMC Sites contain approximately 2.37 million square feet of developed, occupiable space. To meet the needs and objectives provided above, the SUMC Project sponsors propose to demolish approximately 1.2 million square feet of the existing buildings and construct approximately 2.5 million square feet of replacement hospital, clinic/medical office, and medical research uses, resulting in a net increase of approximately 1.3 million square feet of hospital and clinic/medical office uses. These changes are detailed in Table 2-4. As shown in the Table 2-4, the SUMC Project would result in an increase of about 824,000 square feet of SHC facilities within the Main SUMC Site, about 46,000 square feet of new clinic/medical office facilities at the Hoover Pavilion Site, about 442,000 square feet of LPCH facilities at the Main SUMC Site, and no increase in SoM facilities at the Main SUMC Site.

[23] Dave Dockter, Environmental Planner, City of Palo Alto Department of Planning and Community Environment, "SUMC Environmental Impact Report Strategy: How the City will approach evaluation of the Tree Resources in the SUMC Project Area," memorandum, July 28, 2009.

Table 2-4
Proposed Changes in Floor Area within SUMC Sites (square feet)[a]

Category of Use	Existing Floor Area	Proposed Construction	Proposed Demolition	Net Change (Construction Minus Demolition)	Post Construction Floor Area (Existing plus Net Change)
SHC Facilities at Main SUMC Site					
1959 Hospital Buildings (East, West, Core, Boswell)	441,201	0	(441,201)	(441,201)	0
1973 Core Expansion	223,850	0	(223,850)	(223,850)	0
1101 Welch Road Medical Offices[b]	40,100	0	(40,100)	(40,100)	0
Entry	77	0	(77)	(77)	0
Other portions to remain in place, some of which would be renovated (see Table 2-1)[c]	741,887	0	0	0	741,887
New SHC Hospital	0	1,100,000	0	1,100,000	1,100,000
New SHC Clinic/Medical Office	0	429,000	0	429,000	429,000
Subtotal	*1,447,115*	*1,529,000*	*(705,228)*	*823,772*	*2,270,887*
Facilities at Hoover Pavilion Site					
Hoover Pavilion – misc. (shops and storage)	13,831	0	(13,831)	(13,831)	0
Hoover Pavilion – main building	84,230	0	0	0	84,230
Arboretum Children's Center	7,375	0	0	0	7,375
New medical office for community practitioners	0	60,000	0	60,000	60,000
Subtotal	*105,436*	*60,000*	*(13,831)*	*46,169*	*151,605*
LPCH Facilities at Main SUMC Site					
Existing LPCH Hospital	274,700	0	0	0	274,700
New LPCH Hospital	0	471,300	0	471,300	471,300
701 and 703 Welch Road Medical Offices	79,800	0	(79,800)	(79,800)	0
New LPCH Clinic/Medical Office	0	50,000	0	50,000	50,000
Subtotal	*354,500*	*521,300*	*(79,800)*	*441,500*	*796,000*
SoM Facilities at Main SUMC Site					
1959 Hospital Buildings (Grant, Alway, Lane, Edwards)	414,977	0	(414,977)	(414,977)	0
Other portions not to be affected (Falk Building)	52,226	0	0	0	52,226
FIM 1, 2, 3	0	414,977	0	414,977	414,977
Subtotal	*467,203*	*414,977*	*(414,977)*	*0*	*467,203*
TOTAL FLOOR AREA in SUMC SITES	**2,374,254**	**2,525,277**	**(1,213,836)**	**1,311,441**	**3,685,695**

Source: SUMC, 2010.

Notes:

a. Rooftop, basement, interstitial space, and interior areas used to enclose mechanical equipment are excluded from floor area calculations.

b. SUMC plans to construct a 30,000-square-foot medical office space at 800 Welch Road to house the Freidenrich Center for Translational Research (FCTR). That project is not part of the currently proposed SUMC Project, but is expected to be pursued in the future. As such, it is not included in the total floor area in this table.

c. Includes Hospital Modernization Project, Blake Wilbur Clinic, Advanced Medicine Center, and 801 Welch Road. As indicated in Table 2-1, these structures would not be demolished under the SUMC Project.

Categorized according to use, the approximately 1.3 million square feet of proposed additional space would include about 1.2 million square feet of hospital space and about 100,000 square feet of clinic/medical office space (see Table 2-5). There would be no increase in research space.

Parking. To accommodate the increase in floor area, the SUMC Project sponsors propose to replace the occupied spaces that are being demolished, build additional spaces in the same amount needed to meet new parking demand associated with the SUMC Project, and maintain a 10 percent vacancy rate to ensure that drivers are able to locate parking spaces without excessive recirculation through the parking area. As shown in Table 2-2, there are currently 871 occupied spaces in the existing parking facilities that would be demolished, including Parking Structure 3 and Falk Lot 5 on the Main SUMC Site and a portion of Lot 1A on the Hoover Pavilion Site. The expansion components of the SUMC Project would create a demand for 2,053 new spaces in 2025. Thus, the total new and replacement parking provision would be 2,985 spaces, which would be allocated as 2,053 for SUMC Project expansion and 932 as replacement parking for existing spaces demolished during project construction. The replacement parking (932 spaces) is calculated as 871 spaces removed plus a 10 percent vacancy factor. The calculated vacancy factor is slightly less than 10 percent because some of the new demand would be met through existing vacant spaces (see Table 2-6).

The 2,985 spaces to be constructed include 970 spaces in a new SCH underground structure; 430 spaces in a new LPCH underground structure; 500 spaces in a new Clinics underground structure; and 1,085 spaces in a new Hoover Pavilion under- and above-ground structure.[24,25]

Figure 2-6 shows the parking facilities to be demolished, and Figure 2-9 shows the four proposed parking facilities, including three underground garages and one above-ground garage. More information on the parking facilities is provided in Section 3.4, Transportation.

Site Plan

Figure 2-6 shows the existing layout plan at the SUMC Sites, including both the Main SUMC Site and the Hoover Pavilion Site. This figure also shows the structures to be demolished (these structures are also listed in Table 2-1, Table 2-6, and Table 2-7).

Figure 2-10 shows the post-construction site plan and identifies the new structures, which would hold replacement and expansion facilities of the SHC, LPCH, and SoM. A further discussion of the proposed structures is provided under the succeeding subheadings.

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[24] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 3, Table 3-5.

[25] AECOM Transportation, *Stanford University Medical Center Environmental Impact Report, Transportation Impact Analysis,* Appendix C, March 2010.

Table 2-5
Proposed Changes in Floor Area Per Land Use[a] Within SUMC Sites (square feet)[b]

Building	Existing Floor Area	Net Change	Post Construction Floor Area
Hospital Inpatient Use – Main SUMC Site			
SHC portions of 1959 Hospital Buildings	133,025	(133,025)	0
1973 Core Expansion	223,850	(223,850)	0
Existing LPCH	274,700	0	274,700
New SHC Hospital (456 beds)	0	1,100,000	1,100,000
New LPCH Hospital	0	471,300	471,300
Entry	77	(77)	0
Other hospital uses not to be affected[c]	431,280	0	431,280
Subtotal	*1,062,932*	*1,214,348*	*2,277,280*
Clinic/Medical Office Use – Main SUMC Site			
SHC portions of 1959 Hospital Buildings	308,176	(308,176)	0
1101 Welch	40,100	(40,100)	0
701 and 703 Welch	79,800	(79,800)	0
New SHC Clinic/Medical Office	0	429,000	429,000
New LPCH Clinic/Medical Office	0	50,000	50,000
Clinic uses not to be affected[d]	310,607	0	310,607
Subtotal	*738,683*	*50,924*	*789,607*
Clinic/Medical Office – Hoover Pavilion Site			
Hoover Pavilion – main building	84,230	0	84,230
New clinic/medical office	0	60,000	60,000
Subtotal	*84,230*	*60,000*	*144,230*
Other – Hoover Pavilion Site			
Misc. shops and storage	*13,831*	*(13,831)*	*0*
Arboretum Children's Center	*7,375*	*0*	*7,375*
Research/Laboratory – Main SUMC Site			
1959 Hospital Building (Lane, Grant, Alway, Edwards)	414,977	(414,977)	0
Falk Building	52,226	0	52,226
FIM 1, 2, and 3	0	414,977	414,977
Subtotal	*467,203*	*0*	*467,203*
TOTAL FLOOR AREA in SUMC SITES	**2,374,254**	**1,311,411**	**3,685,695**
Total Clinic/Medical Office in SUMC Sites (Main SUMC Site + Hoover Pavilion Site)	***822,913***	***110,924***	***933,837***

Source: SUMC, 2010.

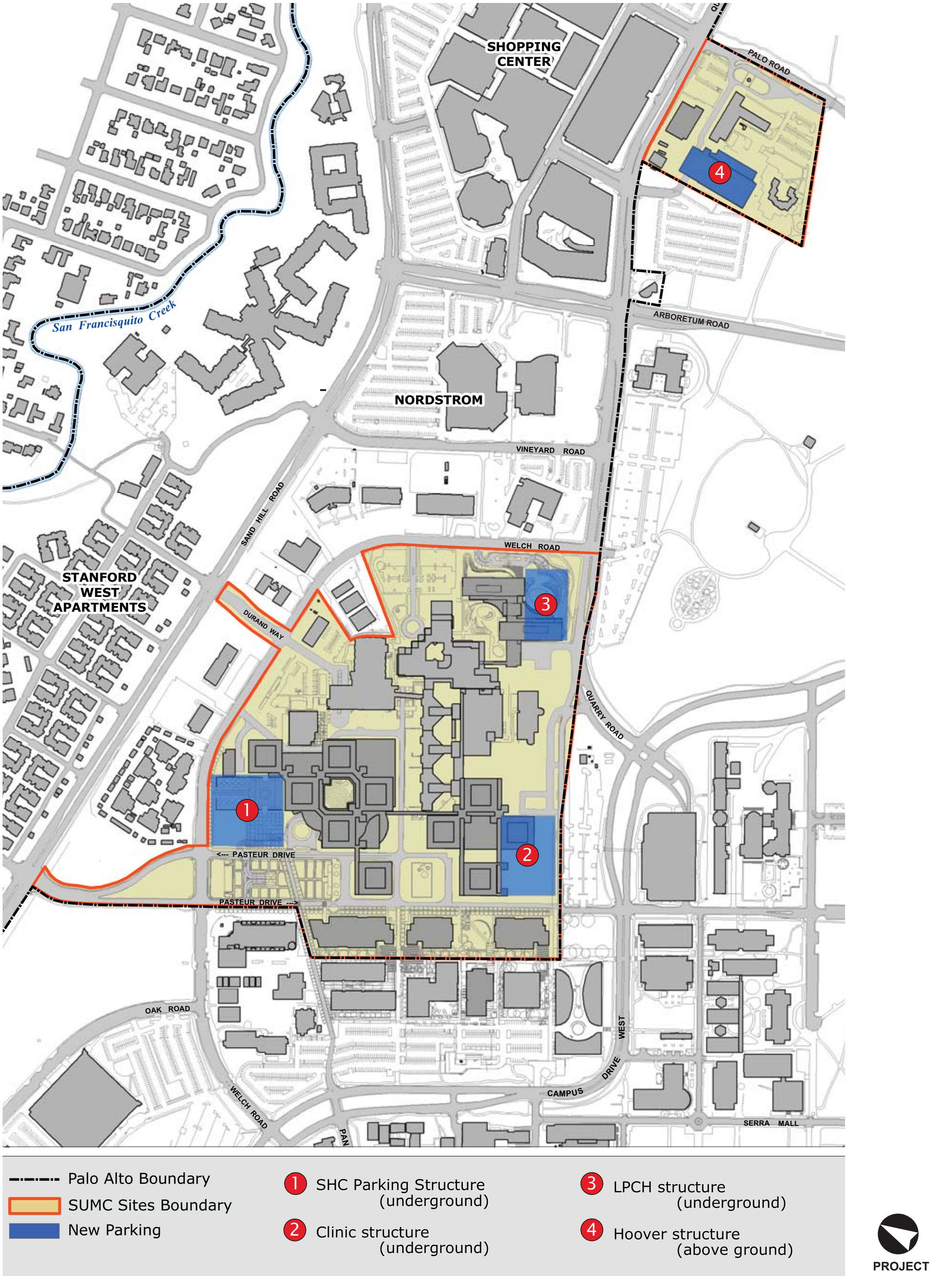
Notes:

a. Identification of uses is approximate.

b. Rooftop, basement, interstitial space, and interior areas used to enclose mechanical equipment shall be excluded from floor area calculations.

c. Includes SHC Hospital Modernization Project, which would be renovated.

d. Includes Blake Wilbur Clinic, Advanced Medicine Center, 801 Welch Road.



Source: PBS&J, 2009.

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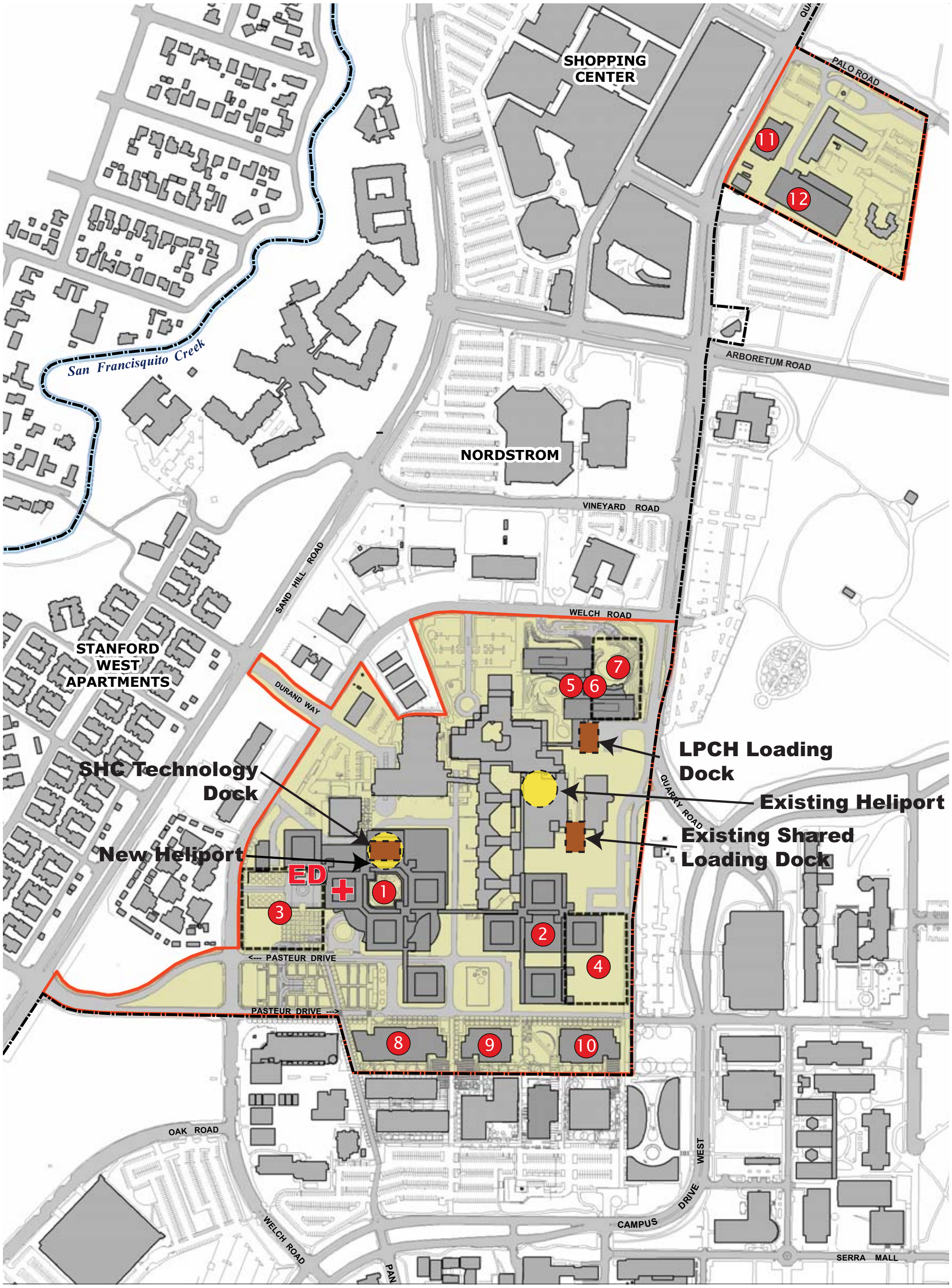
FIGURE 2-9
SUMC Project Proposed Parking Structures



Palo Alto Boundary

SUMC Sites Boundary

Builiding Replacement

1. SHC Hospital Facility
2. SHC Clinic/Office Buildings
3. SHC Parking Structure
4. Clinics Parking (underground)
5. LPCH Hospital Facility
6. LPCH Clinic Building
7. LPCH Parking Structure (underground)
8. Foundations in Medicine #1 (FIM1)
9. Foundations in Medicine #2 (FIM2)
10. Foundations in Medicine #3 (FIM3)
11. Hoover Medical Office Building
12. Hoover Parking Structure

PROJECT NORTH

Source: PBS&J, 2009.

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FIGURE 2-10

Post-Construction Site Plan

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Table 2-6
Proposed Changes in Parking Supply at the SUMC Sites (number of spaces)

Parking Facility	Replacement Parking Demand	Proposed Construction	Net Change
Main SUMC Site			
Existing Parking Structure 3	(671)	0	(671)
Existing Falk Lot 5	(115)	0	(115)
New SHC Structure (Underground)	0	970	970
New LPCH Structure (Underground)	0	430	430
New Clinics Structure (Underground)	0	500	500
Subtotal	*(786)*	*1,900*	*1,114*
Hoover Pavilion Site			
Existing Portion of Hoover Lots	(85)	0	(85)
New Hoover Structure	0	1,085	1,085
Subtotal	*(85)*	*1,085*	*1,000*
Combined Replacement Subtotal	**(871)**	**2.985**	**2,114**
Vacancy Factor (10%)[a]	**(61)**	**0**	**(61)**
TOTAL SUMC SITES	**(932)**	**2,985**	**2,053**

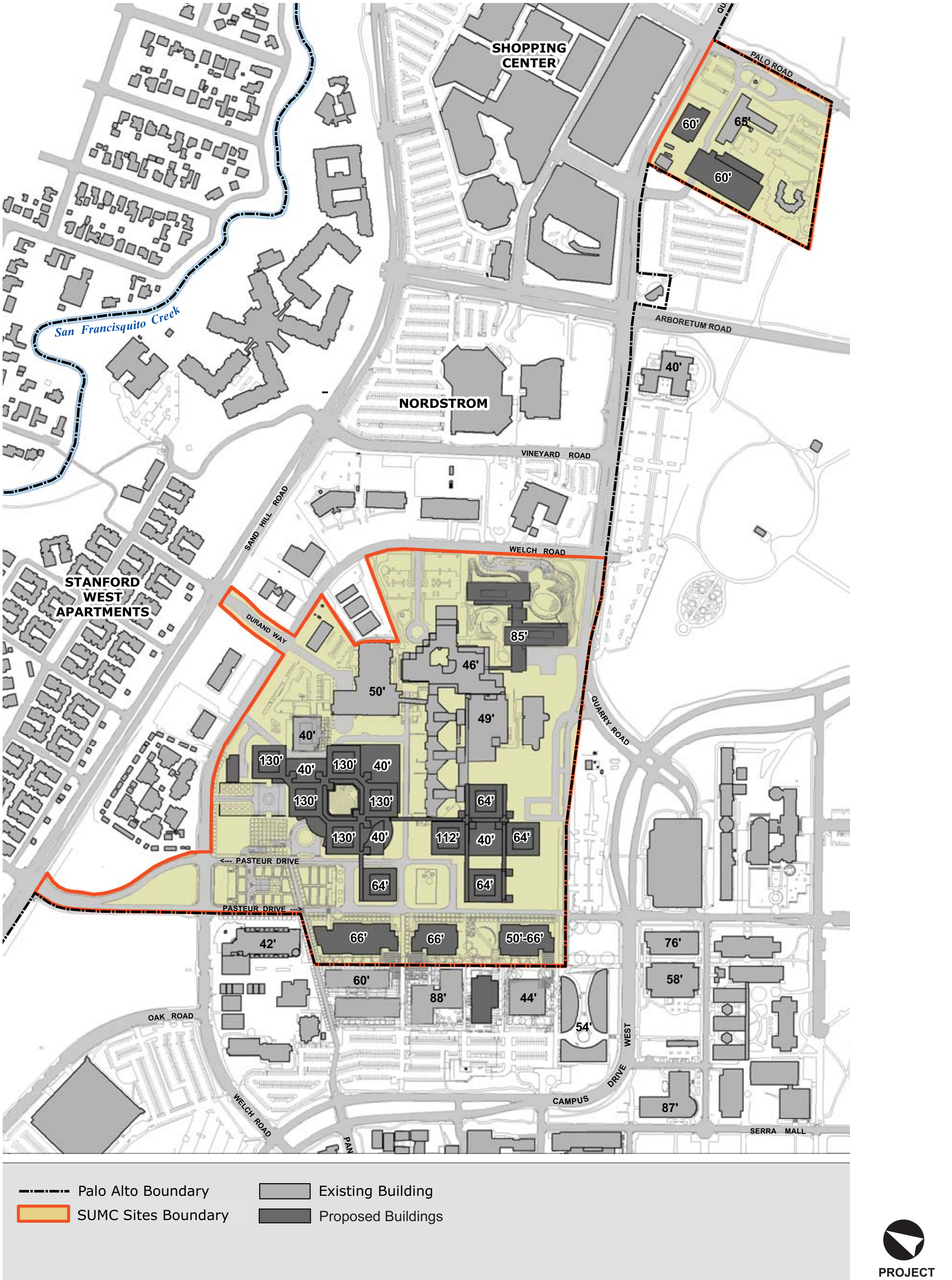
Source: SUMC, 2010.
Note:
a. A 10 percent supply buffer would ensure that drivers are able to locate parking spaces without excessive re-circling. Calculated vacancy factor is less than 10 percent because some new demand will be met through existing vacant spaces.

In terms of site usage, the total post-construction impervious area within the SUMC Sites would be about 44 acres or about 63 percent of the total site area. As such, about 18 acres or 26 percent of the total site area would consist of pervious (landscaped) area with 8 acres of planted roof.[26] Impervious areas within the SUMC Sites would include roadways, building footprints, parking lots, and paved pathways.

Figure 2-11 shows the proposed building heights of the new structures. As shown in these figures, replacement structures are proposed throughout most of the SUMC Sites. The replacement structures would range in height from 40 feet to 130 feet at the Main SUMC Site and would be 60 feet tall at the Hoover Pavilion Site. The tallest structures being proposed at the Main SUMC Site are the 85-foot-tall LPCH expansion along Welch Road, the 112-foot-tall northernmost clinic building, and the 130-foot-tall SHC replacement hospital modules off Pasteur Drive and Welch Road.[27] Currently, the tallest structures at the Main SUMC Site are the SHC Hospital building complex and the LPCH Main Hospital, both of which are 50 feet tall, while the tallest structure at the Hoover Pavilion Site is the 65-foot-tall Hoover Pavilion Building. With its rooftop appurtenance, the Hoover Pavilion reaches 110 feet in height.

[26] Total pervious versus impervious area is extracted from the SUMC Project application and does not exactly correspond to the total 66-acre combined area of both SUMC Sites because sources for the acreages differ. However, the sum of the pervious versus impervious area is 70 acres, which is approximate to the 66-acre combined area of both SUMC Sites.

[27] Building heights exclude rooftop appurtenances and mechanical penthouses.



***Source*: PBS&J, 2009.**

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FIGURE 2-11
SUMC Project Proposed Building Heights

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Stanford University Medical Center Facilities Renewal and Replacement Draft EIR

As identified in Table 2-6, 671 occupied spaces in Parking Structure 3, and 115 occupied spaces in the Falk lot would be demolished on the Main SUMC Site. To replace the demolished occupied parking spaces, provide the requisite vacancy factor, and meet future demand, the hospitals would construct a new SHC underground structure off Welch Road and Pasteur Drive, which would contain 970 spaces. Also, a 500-space Clinic underground garage would be constructed underneath the new clinic/medical office buildings. In addition, the hospitals would construct a new 430-space LPCH underground structure. A total of 1,900 spaces would be provided in the new parking facilities at the Main SUMC Site (see Table 2-6).

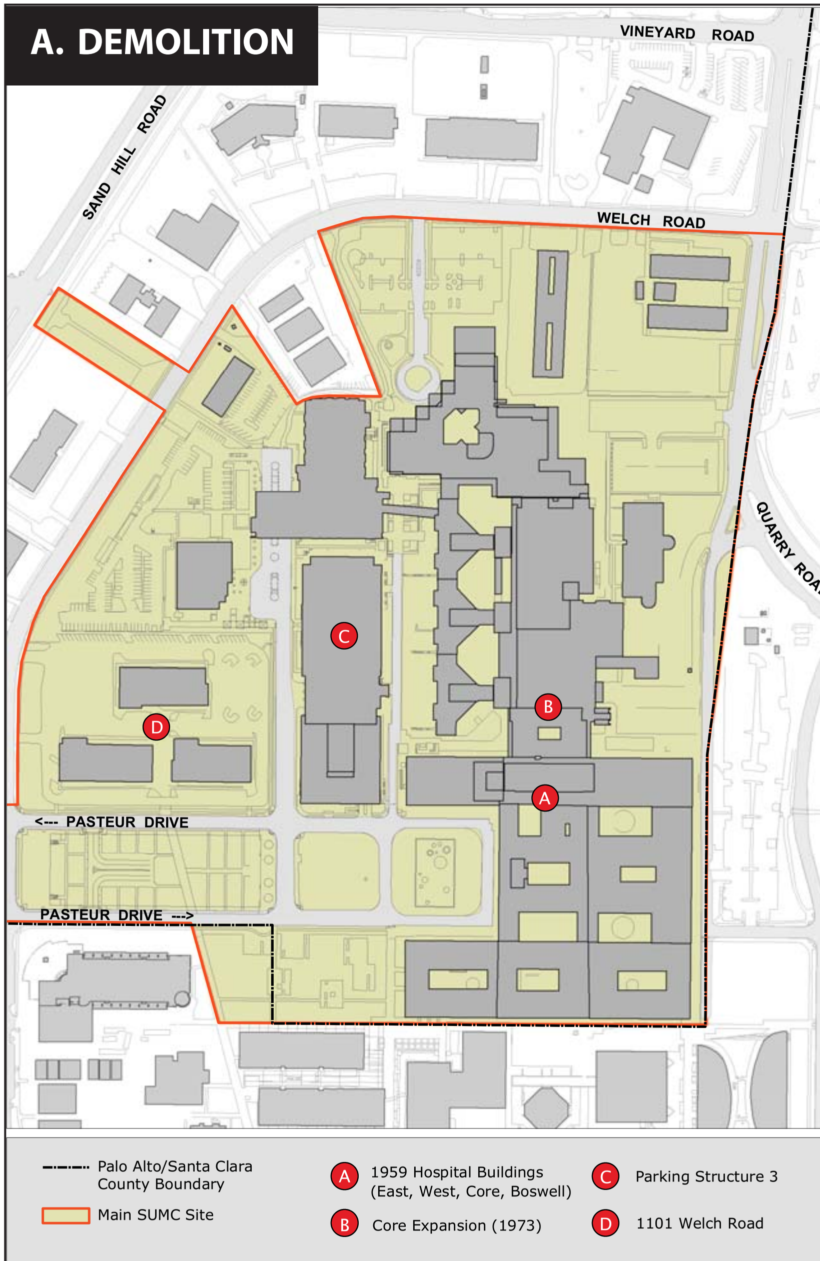
A total of 85 occupied spaces would be demolished at the Hoover Pavilion Site. To replace the demolished parking and accommodate the increase in clinic/medical office space at the Hoover Pavilion Site, a 60-foot-tall garage would be constructed on that site. The garage would provide 1,085 spaces. The SUMC Project would thus provide a net increase of 1,000 spaces at the Hoover Pavilion Site to serve the Hoover Pavilion Site and the Main SUMC Site (see Table 2-6).

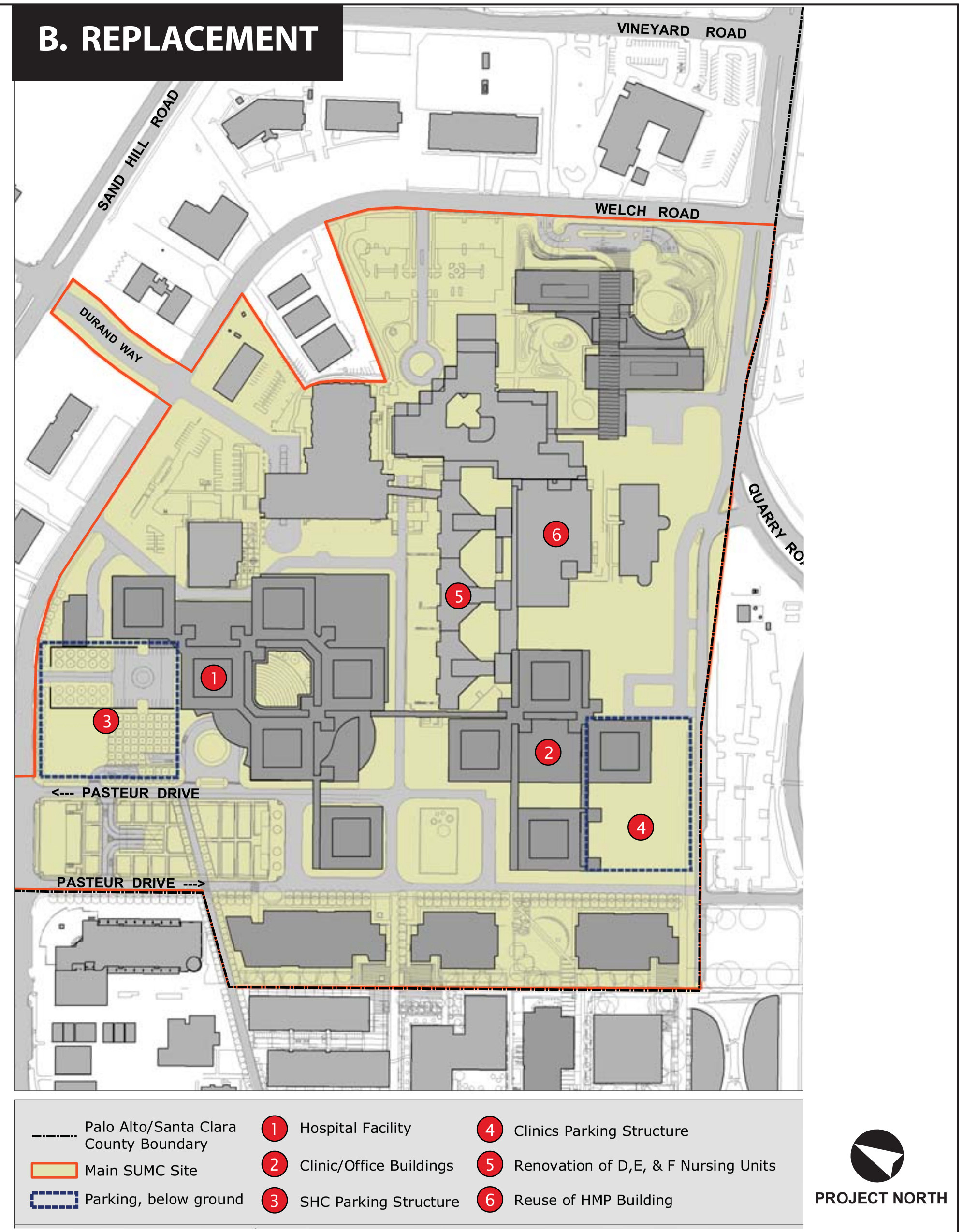
The location of the new underground and above-ground parking structures within the SUMC sites are shown in Figure 2-12 (a and b). Overall, the SUMC Project would provide 2,985 parking spaces for a net change of 2,053 parking spaces.

Stanford Hospital and Clinics. As shown in Figure 2-12 (a and b), the SUMC Project would involve demolition, construction, renovation, and reuse of SHC's hospital and clinic/medical offices. Also, the SUMC Project would build a new, additional heliport and associated helicopter parking spaces (see Figure 2-10). The existing heliport may remain in order to enable landings associated with organ transport to be closer to LPCH when needed for LPCH surgeries. This would not increase the total number of future helicopter flights nor increase impacts, as discussed in Section 3.7, Noise. The SUMC Project would also expand and relocate the SHC ED. A description of the new facilities is provided below.

SHC Hospital. As shown in Figure 2-12(a and b) and as identified in Table 2-5, 133,025 square feet at the East, West, and Core portions of the 1959 Hospital Building complex and 223,850 square feet at the Core Expansion (containing 213 beds) would be demolished. To replace the demolished hospital space, a new 1.1-million-square-foot SHC Hospital building would be constructed where Parking Structure 3 and the medical office/clinic building at 1101 Welch Road are currently located. The main core of the building would be 40 feet tall and the hospital would have five towers, or modules that would be up to 130 feet tall and a sixth module that would be up to 64 feet tall (see Figure 2-11). The new hospital would house 456 beds and would replace shared patient rooms with single patient rooms. Operating and treatment suites, imaging and diagnostic services, a new ED, and associated nursing and support space would be housed in the new hospital building.

The Hospital Modernization Project (HMP) building (see Figure 2-5), which was added in 1989, would be renovated and reused to house diagnostic and treatment space and other supporting functions such as materials management, clinical laboratories, and physician and administrative offices. Nursing units





Source: PBS&J, 2009.

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FIGURE 2-12 A and B
Stanford Hospital and Clinics - A. Demolition and B. Replacements

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D, E, and F, which currently house 243 hospital beds, would be renovated. The transition from shared patient rooms to single patient rooms would reduce the bed capacity of these buildings by 99 hospital beds. As such, this facility would have 144 beds after construction, and the entire SHC portion of the campus would have 600 beds.

Clinics/Medical Offices. As shown in Figure 2-12 (a and b) and as identified in Table 2-5, 308,176 square feet of clinic and medical offices in the SHC portion of the 1959 Hospital Building complex and 40,100 square feet at 1101 Welch Road would be demolished at the Main SUMC Site. To replace and expand the demolished clinic space, four smaller clinic/medical office buildings totaling 429,000 square feet would be constructed where the 1959 Hospital Building complex is currently located. These buildings would range in height from 64 to 112 feet with a center platform at 40 feet (see Figure 2-11).

In addition, as shown in Figure 2-13 (a and b), about 60,000 square feet of clinic/medical office space would be constructed in a new building at the Hoover Pavilion Site and the existing Hoover Pavilion building would be renovated, with portions converted to medical office uses. Healthcare providers who currently lease space at 1101 Welch Road would be offered long-term leases in the Hoover Pavilion.[28] Hoover Pavilion would also continue to be used for SHC clinic-related uses, as it is used currently. The new medical office/clinic structure would be 60 feet (see Figure 2-11). About 13,831 square feet of shops and storage space at the Hoover Pavilion Site would be demolished to accommodate the construction.

Overall, the SUMC Project would result in a net increase of 50,924 square feet of clinic/medical office space at the Main SUMC Site and 60,000 square feet of clinic/medical office space at the Hoover Pavilion site, or a total net increase of 110,924 square feet of SHC and community practitioner clinic/medical office space at the SUMC Sites (see Table 2-5).

Relocated Emergency Department. As shown in Figure 2-5, the existing ED that serves both hospitals is at the south side of the Core Expansion, off Quarry Road. As shown in Figure 2-10, the ED would be relocated to the west side of the proposed hospital building off Welch Road. Also, the ED would be expanded from 11,700 square feet to 47,892 square feet,[29] and the number of treatment spaces would be increased from 38 to 51.

New Heliport. As shown in Figure 2-5, the existing heliport that serves both hospitals is at the roof of the HMP. As shown in Figure 2-10, a new, additional heliport would be located about 700 feet to the northwest, at a height of up to 130 feet on the roof of the new SHC Hospital building. The takeoff/landing pad at the heliport would be designed to accommodate one helicopter at a time. The size of the helicopters regularly using the heliport is anticipated to be the same as under current

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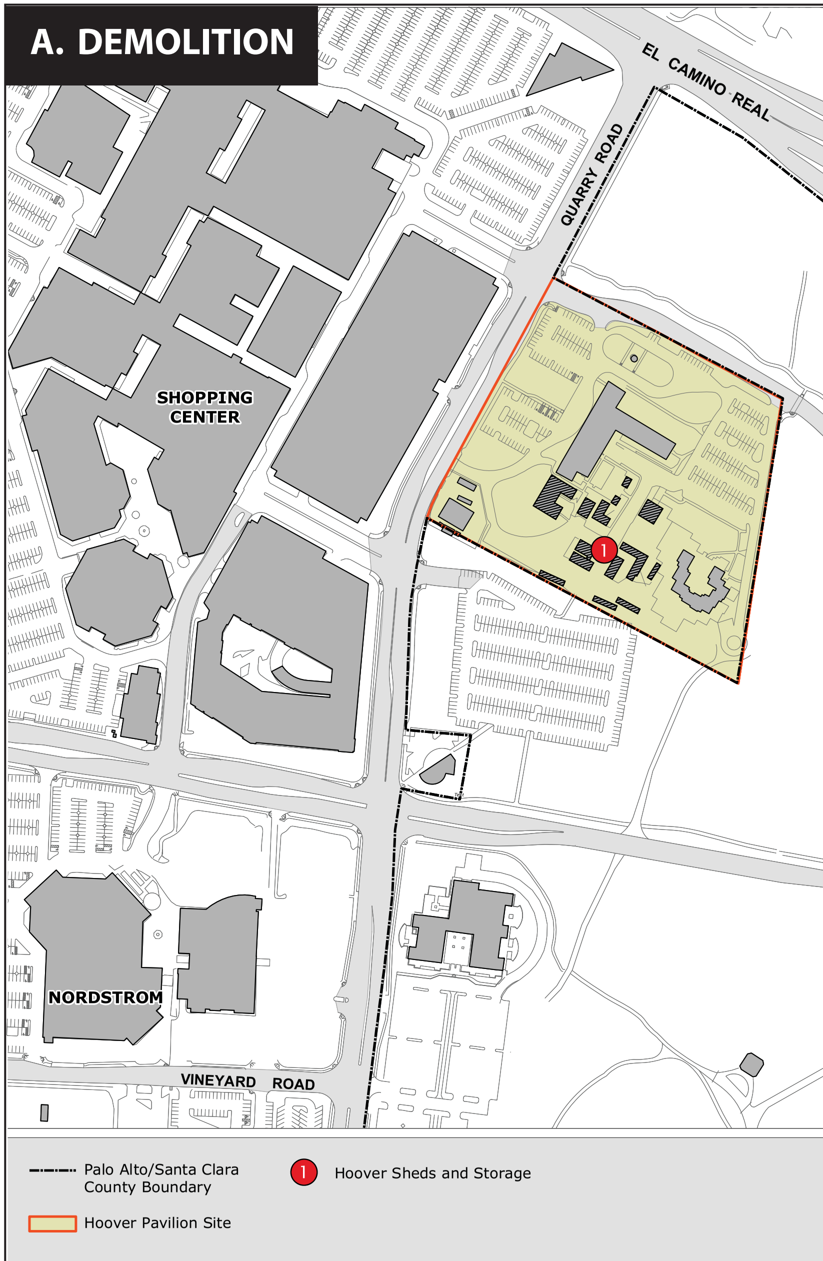
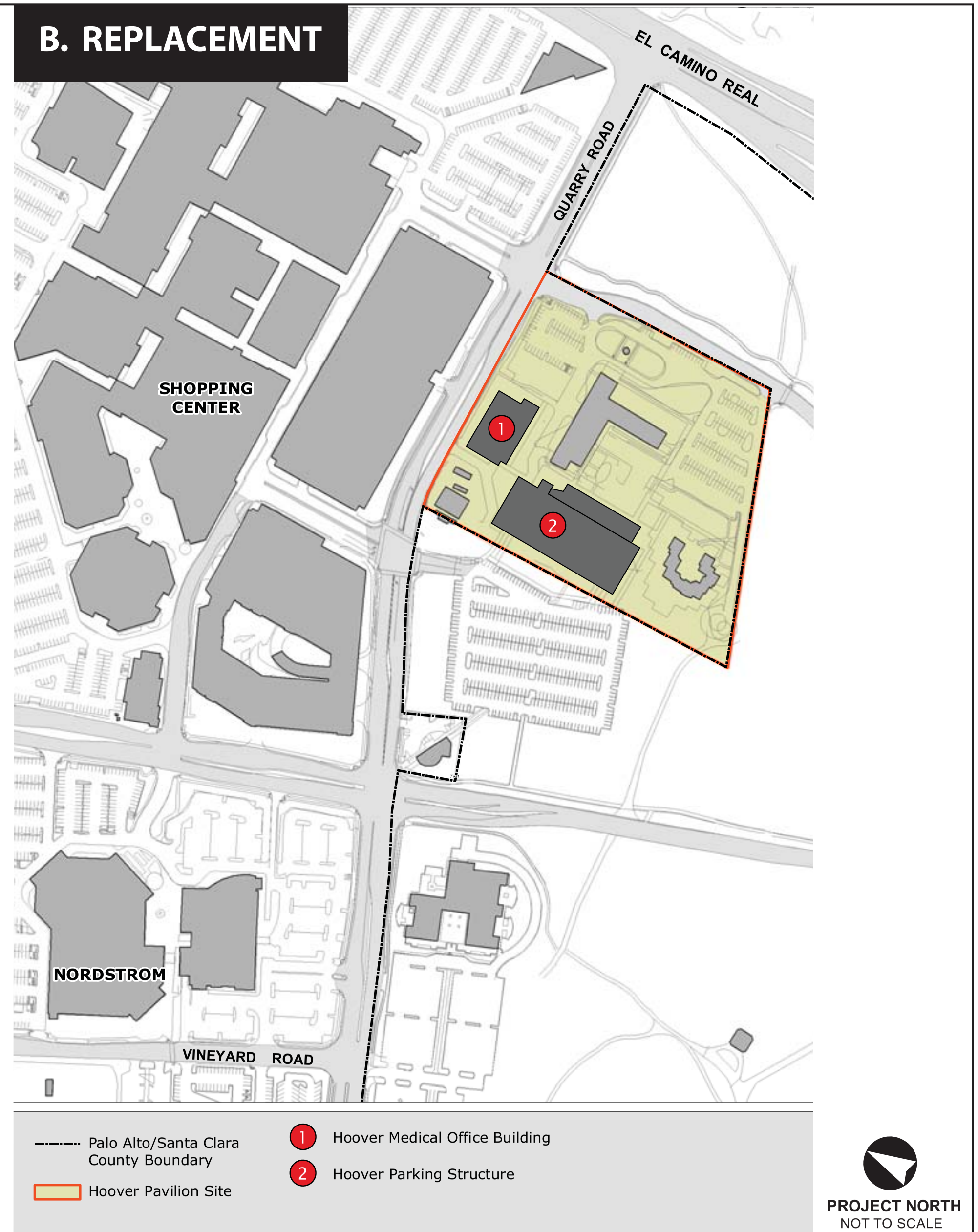
28 SUMC, Memorandum to the City of Palo Alto, "Welch Road Community Health Care Providers," November 7, 2007.

29 The 36,192-square-foot increase in ED size includes 25,000 square feet of "right-sizing" or decompression space, which refers to expanded floor area to serve as treatment space. The right-sizing or decompression trend is typically seen in modernizing hospitals as modern treatment standards require increased floor area per bed or treatment space, compared to older hospital facilities. As such, only 11,192 square feet of the ED expansion would be associated with an increased level of operations.





Source: PBS&J, 2009.

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FIGURE 2-13 A and B
Hoover Pavilion Site - A. Demolition and B. Replacements

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conditions. However, in order to meet new requirements to accommodate larger helicopters in the event of a natural disaster or other large-scale emergency, the new heliport would be constructed to accommodate a helicopter size of 22,000 pounds deadweight (as compared to 12,000 pounds for the helicopters regularly using the heliport). The existing heliport would continue to be used on occasion, primarily for landings associated with organ transport to LPCH.

Lucile Packard Children's Hospital. As shown in Figure 2-14 (a and b), the SUMC Project would involve reuse, renovation, and expansion of LPCH Hospital space, and replacement of clinic/medical office space. A description of the new facilities is provided below.

LPCH Expanded Hospital Space. Two structures on the eastern edge of the Main SUMC Site, 701 Welch and 703 Welch, would be demolished to accommodate expanded hospital space for the LPCH. These two structures, totaling 79,800 square feet, currently house approximately 22,900 square feet of non-SUMC community health providers. The hospitals have leased approximately 40,000 square feet of existing medical office space on Middlefield Road in Menlo Park, and the majority of that space is dedicated to meeting the needs of the community healthcare providers who currently occupy the leased space in 701 and 703 Welch Road, most of whom (dentists and others) do not require hospital proximity.[30]

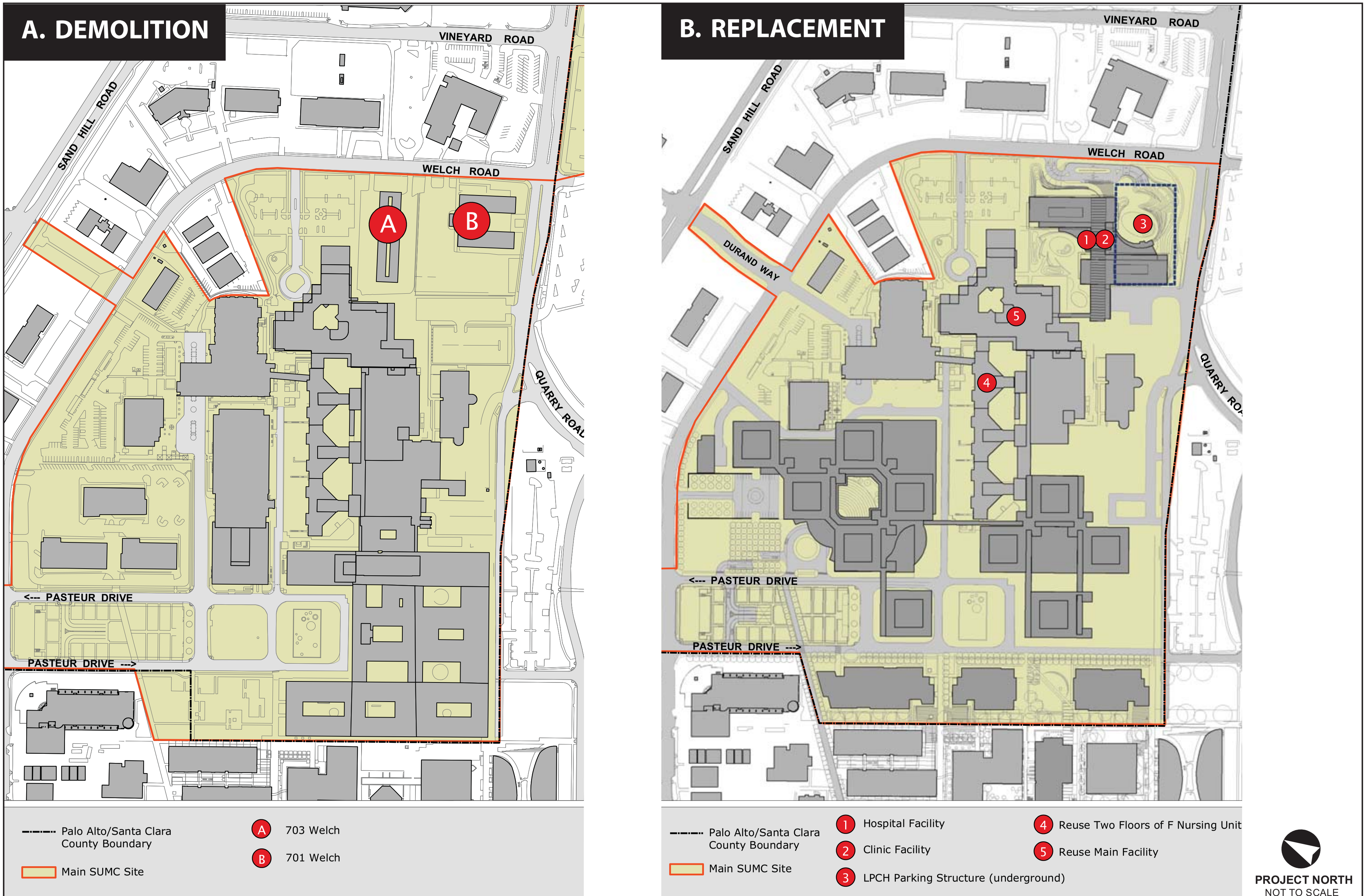
In place of the demolished structures, a new 471,300-square-foot LPCH Hospital expansion would be constructed. The LPCH Hospital expansion would house 104 new inpatient beds, new surgical operating suites, new diagnostic and treatment suites, and associated nursing and support space. The addition would be approximately 85 feet tall (see Figure 2-11).

In addition to the hospital expansion, two floors in the existing F Nursing Unit of the HMP building as well as the main LPCH Hospital facility would be renovated and reused. The portions of the HMP building to be renovated house the F Nursing Unit, including the Obstetrics program. The main LPCH Hospital facility would continue to house the 257 existing inpatient beds as well as diagnostic, treatment, clinical, and support services

LPCH Clinics/Medical Offices. Clinic and support services would be integrated with the 85-foot-tall addition to the LPCH Hospital facilities. The new clinic facilities would add about 50,000 square feet of new outpatient treatment area to the proposed hospital expansion, which would be in addition to the 471,300 square-foot expansion of the new LPCH Hospital. In total, the LPCH expansion would result in a net change of 441,500 additional square feet at the site (including the net loss of 79,800 square feet at 701 and 703 Welch Road).

School of Medicine. As shown in Figure 2-15 (a and b), the SoM portion of the SUMC Project would involve the demolition and replacement of existing research facilities to address seismic requirements and to bring the facilities up to current industry standards. In place of the four existing research

[30] SUMC, Memorandum to the City of Palo Alto, "Welch Road Community Health Care Providers," November 7, 2007.



Source: PBS&J, 2009.

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FIGURE 2-14 A and B
Lucile Packard Children's Hospital - A. Demolition and B. Replacements

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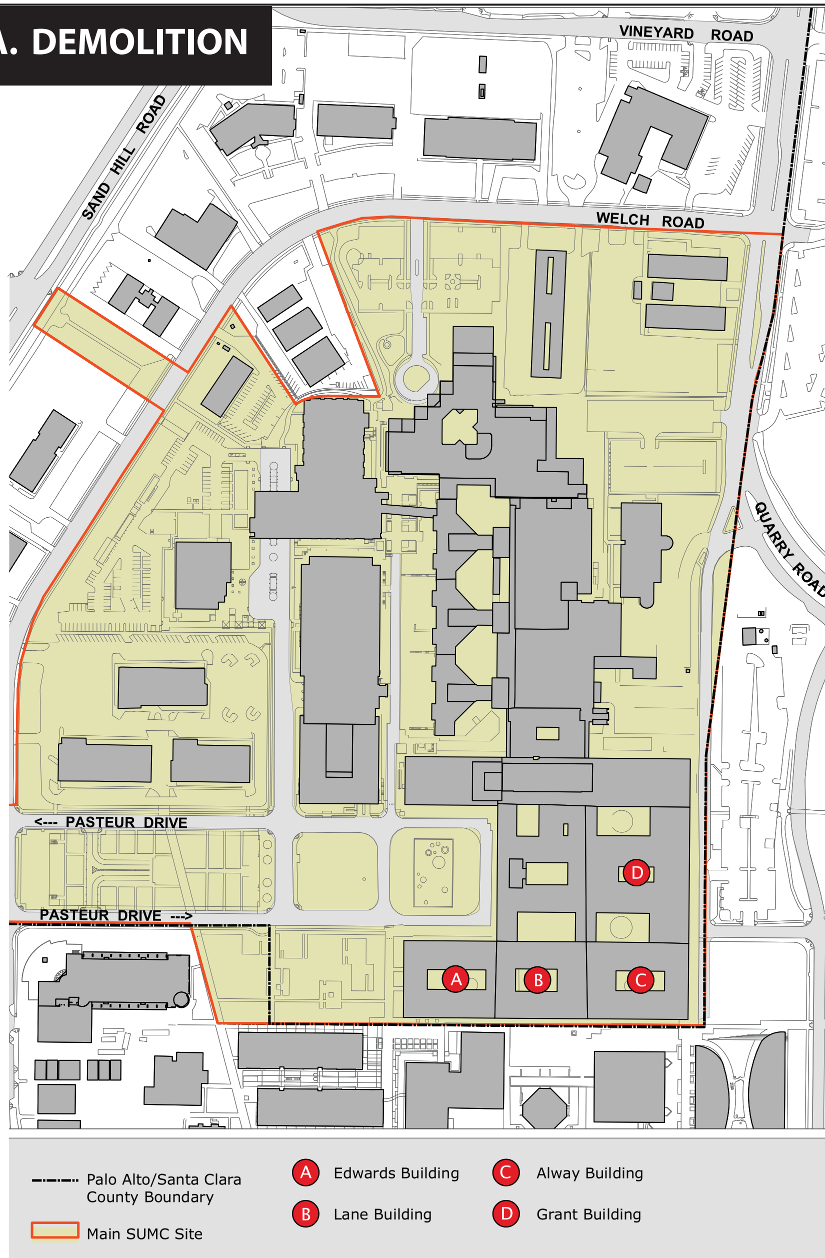
Stanford University Medical Center Facilities Renewal and Replacement Project



Source: PBS&J, 2009.

PBS&J

FIGURE 2-15 A and B

School of Medicine - A. Demolition and B. Replacements

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buildings at the southwest corner of the Main SUMC Site—Edwards, Lane, Alway, and Grant—three separate, new Foundations in Medicine (FIM) buildings would be constructed along the southwest edge of the Main SUMC Site. The largest of the three buildings, FIM 1, would be 185,000 square feet. FIM 2 would be 120,000 square feet and FIM 3 would 109,977 square feet. All FIM buildings would be a maximum height of 66 feet tall. A total of approximately 415,000 square feet would be housed in the three FIM buildings, and no changes in floor area would result from the facility replacement.

As no net change in floor area would result from the SoM facility replacement, no additional parking facilities to support the FIM buildings are proposed.

Right-sizing. Right-sizing refers to increasing floor area per inpatient bed or service without substantially increasing the number of patients or employees. Right-sizing is a trend that many hospitals undergo to conform to modern healthcare standards. As described under the discussion of existing conditions, the SHC and LPCH Hospitals suffer from an outmoded ratio of semi-private patient rooms to single-bed patient rooms and treatment space, and an inadequately sized ED. Replacing these areas would increase floor area, but would not involve an increase in operations. Table 2-7 identifies the portion of the proposed increase in square footage that would be attributed to right-sizing. Approximately 34 percent of the building program would be attributable to right-sizing, and 66 percent would be attributable to increased operation.

Table 2-7
Square Footage Attributed to Right-Sizing[a]

	Total Net Requested (square feet)	**Net Requested for Right-sizing**		**Net Requested for Growth**	
		Square feet	**Percent of Total**	**Square feet**	**Percent of Total**
SHC					
Beds, existing 456 to private		145,000			
Support for 456 beds		150,000			
Emergency Department		25,000			
Total SHC	*823,772*	*320,000*	*39%*	*503,772*	*61%*
LPCH					
Beds, existing 257 to private		87,500			
Support for 257 beds		38,500			
Total LPCH	*441,500*	*126,000*	*29%*	*315,500*	*71%*
Total SoM	*0*	*0*	*0*	*0*	*0*
Total Hoover Pavilion Site	*46,169*	*0*	*0*	*46,169*	*100%*
TOTAL	**1,311,411**	**446,000**	**34%**	**865,441**	**66%**

Source: SUMC, 2009.

Notes:

a. The City's independent peer reviewer determined that the size of space attributed to right-sizing is reasonable: Marlene J. Berkoff, City of Palo Alto Peer Review of Proposed Stanford University Hospital Projects, Preliminary Peer Review Report, November 6, 2007.

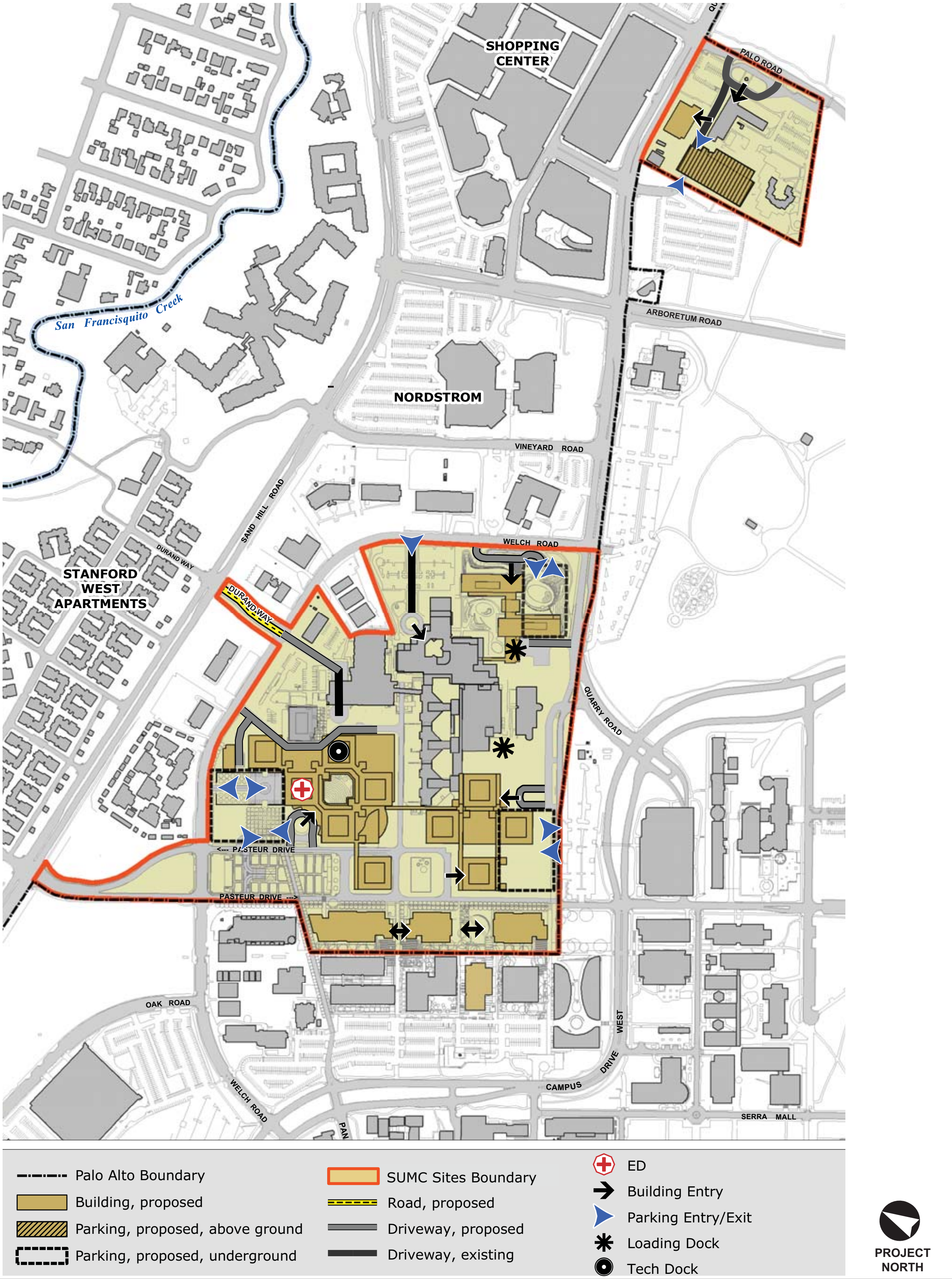
Site Access/Circulation

The SUMC Project would involve alterations to the existing site access pattern at both the Main SUMC Site and the Hoover Pavilion Site; the proposed site access plan is depicted in Figure 2-16. Pasteur Drive, a loop road that begins and ends at the site's northern boundary, would continue to function as an access road for patient/visitor parking, providing access to SHC drop-off and the new SHC parking garage. New access roads/driveways would be constructed and are listed below.

- Welch Road would be widened from two to three lanes to provide a dedicated left-turn lane in both directions, and it would continue to serve vehicle circulation within the SUMC, connecting Quarry Road to Pasteur Drive and to Campus Drive.
- Durand Way, a four-lane connector road, would be constructed between Sand Hill Road and Welch Road to provide additional Medical Center access from Sand Hill Road (at the current signal). No demolition of existing structures would be necessary to construct Durand Way. This connector road would extend into the Advanced Medicine Center.
- A new driveway would be constructed, with ingress and egress from Welch Road; this driveway would provide ambulance access to the new SHC Hospital's ED and service access to the technology dock.
- A second new driveway would be provided for public access to the ED, along with a small area for patient drop-off.
- Two new driveways would be installed to the east and to the south of the proposed new LPCH Hospital addition; these driveways would provide drop off access and access to the new LPCH loading area.
- The existing Quarry Road extension to Roth Way would be improved, and a new loop driveway would be constructed near the new SHC clinic buildings to provide enhanced access to the proposed SHC clinic buildings. Ingress/egress into the SHC clinic underground garage would be off the Quarry Road extension.
- A new drop-off loop, as well as ingress and egress to the new SHC parking structure would be provided from Pasteur Drive.
- New access driveways would be constructed at the Hoover Pavilion Site.

Site Activity

Hospital Beds. The SHC currently operates with 456 beds; with implementation of the SUMC Project, the SHC would add 144 beds for a total of 600 hospital beds. The LPCH currently maintains 257 beds; with implementation of the SUMC Project, the LPCH would add 104 beds for a total of 361 hospital beds. In total, both hospitals currently operate with 713 beds, and with implementation of the SUMC Project both hospitals would add 248 beds for a total of 961 hospital beds.



Source: PBS&J, 2009.

PBS&J

FIGURE 2-16
SUMC Project Site Access Plan

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Patient Visits. Table 2-8 shows the projected number of annual patient visits at the SHC and the LPCH (no patient activity is induced by SoM research/laboratory functions). These estimates are based on current market trends, specific data collected from competing modern healthcare institutions, and knowledge of delivery of complex care. As discussed under Construction Phasing later in the section, both hospitals would be constructed by 2015, although full occupancy of the hospitals would not occur until 2025. As shown in Table 2-8, annual SHC outpatient visits would increase from 403,885 to 470,923 at 2015 (an increase of 67,038) and to 572,949 at 2025 (an additional increase of 102,026). Annual LPCH outpatient visits would increase from 107,363 to 138,893 in 2015 (an increase of 31,530) and to 153,349 at 2025 (an additional increase of 14,456). In total, the SUMC Project would increase annual outpatient visits by 215,050 upon full occupancy at 2025.

Table 2-8
Projected Annual Patient Visits to SHC and LPCH

	SHC			LPCH		
	2006	**2015**	**2025**	**2006**	**2015**	**2025**
Outpatient visits[a]	403,885	470,923	572,949	107,363	138,893	153,349
Inpatient discharges[b]	22,914	24,328	27,379	11,889	13,843	17,232
Inpatient days[c]	132,182	150,835	169,749	70,752	85,978	109,886
Average daily census[d]	362	413	465	194	236	301

Source: SUMC, 2010.

Notes:

a. Outpatient visits: The number of visitors to on-site outpatient clinic facilities.

b. Inpatient discharges: The number of inpatient discharges from both hospitals.

c. Inpatient days: The total number of days that beds are filled for the year.

d. Average daily census: The daily average number of beds filled (inpatient days divided by 365 days).

Concerning in patient visits, the average daily census of the SHC would increase from 362 to 413 at 2015 (an increase of 51 occupied beds) and to 465 at 2025 (an additional increase of 52 occupied beds). Similarly, the average daily census for the LPCH would increase from 194 to 236 at 2015 (an increase of 42 occupied beds) and to 301 at 2025 (an additional increase of 65 occupied beds). In total, the SUMC Project would increase the daily average number of occupied beds by 210 upon full occupancy in 2025.[31]

Approximately 60 percent of the SUMC's in-patients visit the facilities from the surrounding counties of Santa Clara and San Mateo (32 percent and 28 percent, respectively).[32] Eight percent of in-patient visits are from Alameda County. Each of the other surrounding counties contribute about 3 percent or less of the SUMC's annual in-patient base. Other visitors come from throughout the state or from out-

31 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5.

32 Estimates are based on inpatient discharges for 2006, sorted by zip code. Source: Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5, Table 5-6.

of-state locations. These rates would be expected to remain fairly constant following completion of the SUMC Project, although the expanded facilities could allow the SUMC to provide additional specialty services to clientele inside and outside of the immediate service area.

Employment. Table 2-9 shows the projected on-site employment that would be expected over time following buildout of the SUMC Project. Currently, non-SUMC providers occupy space within the existing SUMC; these non-SUMC providers are included in the overall employment count. As part of the SUMC Project, some of the non-SUMC providers that could be displaced by the demolition would be relocated to the Hoover Pavilion Site. Full buildout and occupancy of the SUMC Project would result in an increase of 2,242 new full-time equivalent employees,[33] or an approximately 23 percent increase over 2007 employment. In 2015, the SUMC Project would add 1,929 net new employees, or an approximately 20 percent increase over 2007 employment. Upon full buildout, SUMC would include approximately 12,123 employees.[34] Table 2-9 also shows the projected changes in employment without adjusting for part-time status. Without such an adjustment, employment is projected to increase by 2,417 employees.

Table 2-9
Projected On-Site Employment With SUMC Project

Projected Employment (Total Employees)	Existing (2007)	Proposed Employment at Full Buildout (2025)	Change	Part-Time Multiplier[a]	Net Change (Adjusted For Part-Time Employment)
SHC, including the Hoover Pavilion Site	5,240	6,562	1,322	0.94653	1,251
LPCH	1,666	2,655	989	0.90149	891
SoM [b]	2,823	2,823	0	-	0
Non-SUMC Providers	151[c]	257	106	0.94653	100
TOTAL	**9,880**	**12,297**	**2,417**		**2,242**

Source: SUMC, 2010 and KMA, 2009.

Notes:

a. Employment counts have been adjusted by KMA to count only the portion of housing need for part-time employees generated by the SUMC Project. The adjustment is based on the assumption that part-time employees generally have other employment. The adjustment factor is calculated from SUMC payroll data and weighs part-time employees based on percentage of a full-time schedule. Part-time employees working up to 70 percent of full-time are adjusted; employees working 70 percent time or more are not assumed to have another part-time job and are therefore not adjusted.

b. Includes faculty, staff, and students. For the purposed of this analysis, SoM employment is assumed to be unchanged.

c. Estimated by KMA at 350 square feet per employee.

SUMC's current employees generally are from Palo Alto or commute from nearby communities such as East Palo Alto, Fremont, Hayward, Menlo Park, Mountain View, Redwood City, San Francisco, San Jose, San Mateo, and Sunnyvale. Employee commute patterns are expected to be similar under the SUMC Project.

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33 Adjusted for part-time employment.

34 Keyser Marston Associates, Final Proposed Stanford University Medical Center Expansion Housing Needs Analysis, September 2009.

Heliport Activity. SUMC anticipates that heliport operations would increase by 10 percent upon 2015 and by 28 percent upon full occupancy of the two hospitals by 2025 (see Construction Phasing discussion later in this section for more information on anticipated construction and occupancy schedules). That is, from the existing 2,120 annual helicopter trips (an average of six daily trips), the SUMC Project would increase annual trips to 2,332 (an average of six daily trips) by 2015 and to 2,714 (an average of seven daily trips) by 2025. These additional annual trips equal less than one additional trip per day at 2015 and about one additional trip per day at 2025. As is currently the case, trips would be permitted during both day and nighttime hours. About half of the trips (about one trip every other day) would be associated with refueling at the Palo Alto Municipal Airport; given the amount of additional trips, there would be no noticeable increase in the number of trips associated with the Palo Alto Municipal Airport. About five to six trips per year would be associated with maintenance trips to Moffett Field. All of the refueling and maintenance trips are included in the total of 2,332 trips projected for 2015 and 2,714 trips projected for 2025.

The helicopter approach and departure paths would generally remain the same as current paths. The departure path is northward, just short of Sand Hill Road, where the helicopter then swings to the southwest, over Stanford University property. The approach path to the heliport is from the southwest. According to SUMC, flight paths do not and would not overfly residential areas north of Sand Hill Road in the future.

Emergency Department Activity. As previously stated, the ED would be expanded from 11,700 square feet to 47,892 square feet,[35] and the number of treatment spaces would be increased from 38 to 51. Based on this increase in size and treatment spaces, SUMC anticipates annual ED visits to increase from the current 42,522 (116 per day) to 61,200 (168 per day) by 2015 and to 72,675 (199 per day) by full occupancy of the hospitals in 2025. The proportion of ambulance visits is expected to remain fairly constant in the future (i.e., 19.6 percent of ED visits). Therefore, the SUMC estimates ambulance trips would increase from the current total of 8,331 trips (23 per day) to 11,995 trips (33 per day) by 2015 and 14,244 trips (39 per day) by full occupancy of the hospitals in 2025. The ED relocation would result in the continuation of ambulance trips along Quarry Road, Welch Road, and Sand Hill Road south of Pasteur Drive and rerouted. Additional ambulance trips would occur along Sand Hill Road between El Camino Real and Pasteur Drive.

Loading Activity. As shown in Figure 2-5, a single existing loading area, off Quarry Road, serves SHC and LPCH at the Main SUMC Site. As shown in Figure 2-10 and outlined in Table 2-10, the existing loading area would be maintained and two more would be added. A new loading area would serve the LPCH (truck access to the loading areas is depicted in Figure 2-16). A third technology dock would be added that would have access off Welch Road when major equipment would be delivered and, therefore, would have minimal truck trips. The technology dock would experience about two deliveries per month.

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35 The 36,192-square-foot increase in ED size includes 25,000 square feet of "right-sizing" or decompression space, which refers to expanded floor area to serve as treatment space. The right-sizing or decompression trend is typically seen in modernizing hospitals as modern treatment standards require increased floor area per bed or treatment space, compared to older hospital facilities. As such, only 11,192 square feet of the ED expansion would be associated with an increased level of operations.

Because the demand for deliveries is closely related to hospital inpatients,[36] there would be an incremental increase in loading trips proportional to the projected increase in inpatient discharges. Approximately 50 percent of the delivery demand would be met with existing trucks that would be filled to a greater capacity.[37] The resulting truck trips to the loading areas are shown in Table 2-10, which indicates an increase of five daily trips by 2015 (two at the LPCH loading dock and three at the SHC loading dock) and an additional nine daily trips between 2015 and 2025 (three at the LPCH loading dock and six at the SHC loading dock). The percentage of trips per vehicle type would remain constant to those identified in Table 2-3 for the existing conditions.

Table 2-10
Projected Loading Activity for SUMC Project (Truck Trips)

	Current	Partial Buildout (2015)	Full Buildout (2025)
SHC	24,638	25,377	26,979
LPCH	8,212	8,869	10,060
Annual Total	32,850	34,246	37,039
Weekly Total (divide annual total by 52)	632	659	712
Daily Total (divide weekly total by 6)[a]	105	110	119

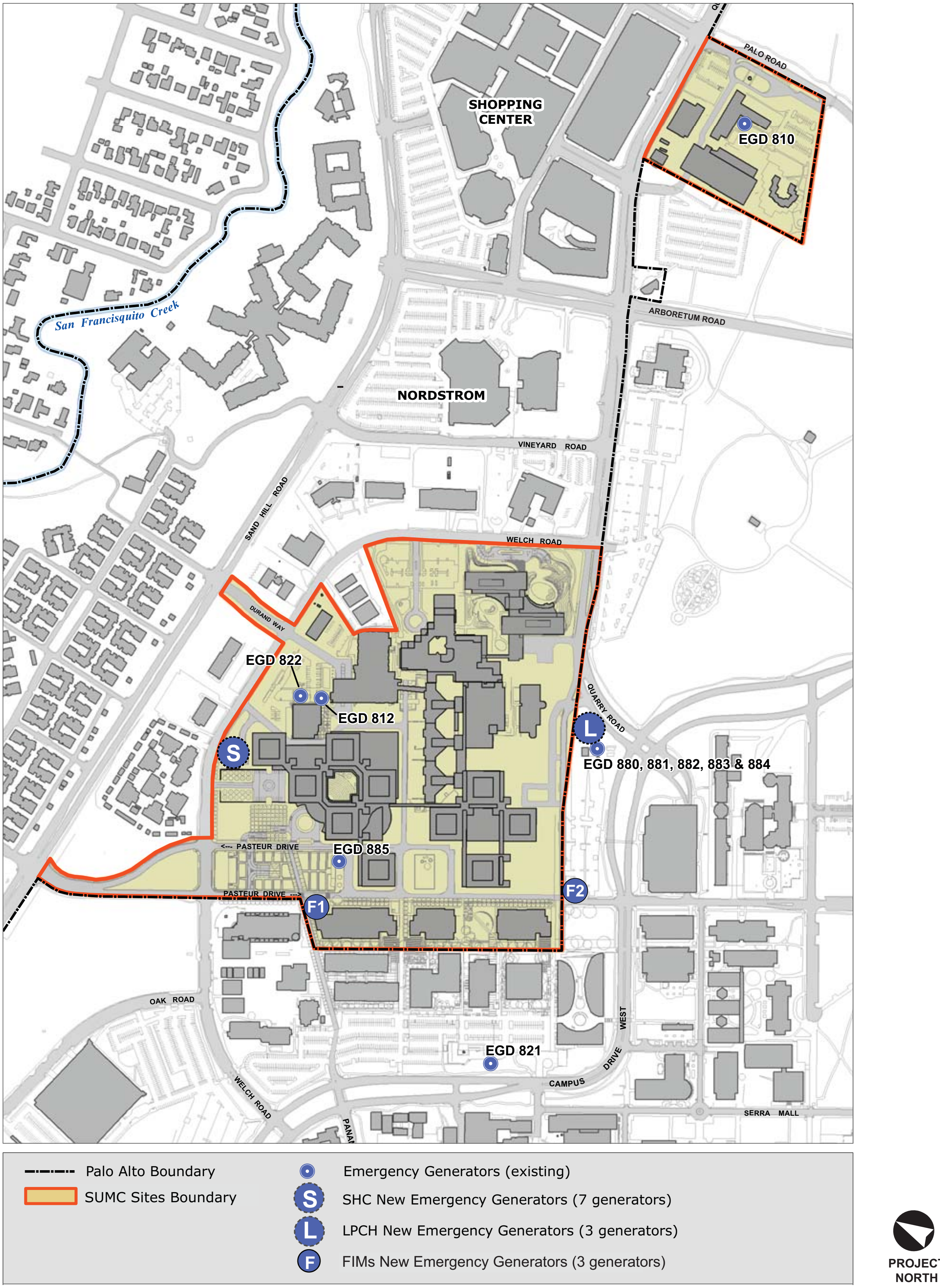
Source: SUMC, 2010.
Note:
a. Saturday and Sunday are each calculated as half a day, due to lower traffic rates.

Utilities and Mechanical Equipment

As previously described, major mechanical equipment serving the SUMC includes Stanford's CEF, twelve operating emergency generators (plus an extra generator on stand-by as required by OSHPD), and rooftop mechanical equipment (primarily electrical fans). As a separate project, Stanford University has applied to Santa Clara County for an expansion of the off-site CEF to support campus-wide steam and chilled water demands. The increased steam and chilled water demand of the SUMC Project would be accommodated at the CEF, whether or not Santa Clara County approves the expansion application. The chilled water peak demand increase would be accommodated either by a large chiller placed in an existing building at the CEF (which would not require the proposed expansion) or in the new Cooling Tower 5 building that is the subject of the expansion application. The steam demand increase would be accommodated by replacement of existing boilers with more efficient lower emitting boilers. This boiler replacement would be conducted under existing air emission limits such that no increase in emissions over historic emission quantities would occur.

Figure 2-17 depicts the location of existing and proposed emergency generators. Under OSHPD requirements, an additional 21 megawatts of emergency generator capacity would be required for the SUMC Project. Ten new 2-megawatt generators would be provided within the Main SUMC Site;

[36] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5.
[37] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5.



Source**:** PBS&J, 2009.

PBS&J

FIGURE 2-17

SUMC Project Proposed Emergency Generators

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Stanford University Medical Center Facilities Renewal and Replacement Draft seven for SHC between Welch Road and the proposed hospital, and three for LPCH adjacent to the existing generators near Quarry Road. In addition, each of the proposed SoM buildings (FIM 1, 2, and 3) would have an emergency generator in proximity to the proposed building with no more than two generators at any location. In total, the SUMC Project would add 13 emergency generators to the Main SUMC Site.

Although the exact generator specifications are not known at this time, all generators would comply with current California Energy Commission and Bay Area Air Quality Management District standards. In addition, all generators bought and permitted (but not installed) through 2010 would be required to comply with EPA Tier 2 requirements while all generators bought and permitted (but not installed) after 2010 must comply with EPA Tier 4 requirements.

The new buildings would also have rooftop equipment, similar to existing rooftop equipment. Rooftop equipment at the SUMC primarily includes electrical fans and noise shielding.

Lastly, the SUMC Project would require increases in utility services from the City. Projected level of service demand from each provider is identified in Section 3.15, Utilities. Aside from rerouting utility lines within the SUMC Sites, the SUMC Project would require resizing the utility delivery systems just outside the SUMC Sites, in order to accommodate the increased activity on the sites. It is expected that the SUMC Project would require additional electrical feeder cables in order to serve the increased electrical demand on the SUMC Sites. This installation would potentially require trenching along Quarry Road, Welch Road, and Pasteur Road.[38] These improvements are considered in the impact analysis in the appropriate technical sections of this EIR.

Other Project Elements

Sustainable Design Initiatives. On December 3, 2007, the Palo Alto City Council adopted the Palo Alto Climate Protection Plan. The goal of the plan is to present a comprehensive inventory of municipal (City government-generated) and community-generated carbon dioxide (CO_2) emissions, propose reduction targets, and propose practical steps to reach those targets. The plan contains a number of goals and actions to help the City reach its CO_2 emission reduction targets (these City goals and actions are addressed in Section 3.6, Climate Change).

The SUMC Project proposes to implement measures and programs that would reduce CO_2 emissions consistent with the City's Climate Protection Plan and that would carry out the SUMC Project sponsors' sustainability objective. These measures are listed in Section 3.6, Climate Change. The measures and programs generally involve energy conservation, use of renewable energy and sustainable building materials, tree planting, use of hybrid vehicles and shuttles, environmentally-preferable purchasing, education, green building, and waste reduction. In addition to the measures proposed specifically for the SUMC Project, other measures are already being implemented in the SUMC independently from the SUMC Project.

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[38] Sam Zuccaro, Electric Engineering Manager, City of Palo Alto, electronic communication with PBS&J, January 7, 2007.

Landscaping. While detailed landscape plans are not yet available, new landscaping implemented as part of the proposed SUMC Project would be consistent with existing landscaping at the SUMC Sites. Such landscaping would use drought tolerant plants and would emphasize native flora. Native oaks throughout the site would be preserved, and lawn would be used minimally to conserve water usage. An important design guideline during development of the SUMC Project plans is to achieve a 'no net loss' of open space pursuant to SUMC Project development. Approximately 30 percent of the SUMC Sites currently consist of pervious areas. Approximately 37 percent of the SUMC Sites would consist of pervious area post-construction, an increase of about 23 percent.

2.6 SUMMARY COMPARISON OF EXISTING AND PROPOSED DEVELOPMENT

In order to compare existing land uses with proposed land uses, Table 2-11 provide existing and proposed development on the SUMC Project Sites. The existing and proposed site plans for the SUMC Project are illustrated in Figure 2-6 and Figure 2-10, respectively. Existing SUMC parking facilities to be demolished and replacement parking facilities are shown in Figure 2-6 and Figure 2-9, respectively.

2.7 PROJECT CONSTRUCTION

The below description provides a conservative estimated construction timeline for the SUMC Project. It should be noted that in the analysis sections, Section 3 of this document, a conservative construction schedule, equipment, and staffing assumptions are made, depending on the environmental parameter being analyzed.

Construction Schedule

Table 2-12 provides the proposed construction schedule, including the anticipated development milestone per specified timeframe. The estimated timeline for construction is approximately 12 years. Assuming SUMC Project approval in mid-2009, the SUMC Project demolition and construction would occur from 2009 through 2021. However, due to a number of factors, including the lengthy OSHPD review process, if the SUMC Project will be approved, approval will occur later than assumed in this EIR. It should be considered that the construction schedule can continue to change in numerous ways over the construction duration. The mid-2009 approval date serves as a conservative assumption to ensure that mitigation would be in place when warranted and not later.

Also, it should be noted that while construction is assumed to be completed in 2021, projected occupancy of the proposed structures would not occur immediately after construction and would require time to ramp up. Consequently, the SUMC Project sponsors project full occupancy of the proposed structures by 2025.

Table 2-11
SUMC Project: Comparison of Existing and Proposed Uses

	Existing	Post Construction
General Plan Land Use Designation	Major Institution/Special Facilities Research Office Park Major Institution/University Lands/Campus Education Facilities (Unincorporated Santa Clara Co.)	Major Institution/Special Facilities Research Office Park
Zoning	Public Facilities Medical Office and Research A1 (Unincorporated Santa Clara Co.)	Hospital District Hospital – Hoover Medical Office and Research
Building Square Footage	Main SUMC Site – 2.3 million square feet Hoover Pavilion Site - 105,436 square feet	Main SUMC Site – 3.5 million square feet Hoover Pavilion Site - 151,605 square feet
Height	Main SUMC Site –50 feet Hoover Pavilion Site – 65 feet/110 with rooftop appurtenance	Main SUMC Site – 130 feet Hoover Pavilion Site – 65 feet/110 with rooftop appurtenance (60 feet for new structures)
Parking	Occupied Parking Spaces to be removed • Parking Garage 3 – 671 • Falk Lot 5 – 115 • Lot 1A – 85	Replacement and New Spaces • SHC underground structure - 970 • Clinics underground structure – 500 • LPCH underground structure – 430 • Hoover Pavilion above-ground structure – 1,085
Impermeable/ Permeable Surface	Impermeable – 70 percent Permeable – 30 percent	Impermeable – 63 percent Permeable – 37 percent
Total Employment	9,880 employees	12,297 employees (12,123 employees after part time adjustment)
Beds	SHC – 456 beds LPCH – 257 beds	SHC – 600 beds LPCH – 361 beds
Patient Visits (annual)	SHC: Outpatient – 403,885 visits Inpatient – 22,914 discharges	Outpatient – 572,949 visits Inpatient – 27,379 discharges
	LPCH: Outpatient – 107,363 visits Inpatient – 11,889 discharges	Outpatient – 153,349 visits Inpatient – 17,232 discharges
Ambulance Trips (annual)	8,334 trips	14,244 trips
Helicopter Trips (annual)	2,120 trips	2,714 trips
Loading/Deliveries (annual)	32,850 deliveries	37,039 deliveries

Source: SUMC, 2010 and KMA, 2008.

Construction Equipment, Staffing, and Staging

Table 2-12 through Table 2-16 provide for the SHC, LPCH, and SoM proposals a more specific breakdown of construction activities and their durations, as well as the expected types of equipment and number of construction staff that can be expected on site for each duration. Major construction equipment that would be used during the approximately 12-year construction period would include excavators, drill rigs, concrete mixers, cranes, generators, and various trucks and diesel engines. The construction and possible construction staging areas are shown in Figure 2-18.

SHC. As shown in Table 2-13, analysis in this Draft EIR shows construction of the SHC facilities to start in late 2009 and be completed by 2021. The most intensive construction activities would occur between 2011 and 2015, when the SHC replacement hospital would be constructed. During this four-year period, the average number of construction workers on site would range from 500 to 800 workers.

In general, all construction worker parking would be planned off site for the entire SHC component construction period. Shuttle buses would bring the construction staff to and from the site. As of preparation of this document, the location of the parking site has not been determined. SHC has stated that the off-site location would be planned to minimize impacts on traffic patterns immediately adjacent to the SUMC Sites.

New SHC parking would be completed prior to demolition of existing parking to prevent shortages. Temporary fencing off of the eastern branch of Pasteur Drive would be necessary during construction of the main hospital, but this would be compensated for by allowing two-way traffic on the western branch.

LPCH. As shown in Table 2-14, construction of the LPCH facilities would start in mid-2009 and would be completed in 2015. The LPCH Hospital building would be complete in mid-2014 while the clinic facilities, which would be constructed as part of the new LPCH Hospital building, would be complete by 2015 with renovation work continuing past that date. The most intensive construction activities would occur between 2010 and 2014, when the LPCH expansion would be constructed. During this four-year period, the average number of construction workers on site would range from 270 to 450 workers.

As with SHC construction, all construction worker parking for LPCH would be planned off site for the entire construction period. Shuttle buses would bring the construction staff to and from the site.

For construction of the LPCH facilities, there would be intermittent lane closures on Welch and Quarry Road, but the existing LPCH Hospital entrance would be largely unaffected by the construction.

Table 2-12
SUMC Project Overall Construction Schedule

Year	Construction Milestone
SHC – Phase 1 (Mid-2009 – 2015)	• Prepare medical office space for 1101 Welch tenants at Hoover Pavilion existing building and relocate tenants. • Demolish 1101 Welch and construct new parking structure • Demolish SHC Parking Structure 3 • Construct 456-bed replacement hospital with associated surgery, diagnostics, imaging, and support. Create connections to existing 1989 HMP building.
SHC – Phase 2 (2016 - 2021)	• Demolish Core Expansion (1973) building and the SHC portion of the 1959 Hospital Building complex (Core, East, West and Boswell). • Construct new Clinics/Medical Office buildings and underground parking structure. Relocate functions from Core Expansion (1973) building and other buildings into new Hospital and Clinics/Medical Office Buildings. Renovate existing hospital facilities as necessary for new, right-sized or expanded functions.
LPCH – Phase 1 (Mid-2009 – 2015)	• Relocate 703 Welch tenants to other medical office space outside of SUMC Sites. • Assist in relocation of 701 Welch tenants • Demolish 701 and 703 Welch • Construct new 104-bed addition including surgery, diagnostics, imaging, and support and new clinics. Construct associated parking structure. Relocate existing functions as required into new facility.
LPCH – Phase 2 (2014 – 2017)	• Renovate vacated space as necessary for new, right-sized, or expanded functions.
SoM – Phase 1 (FIM) (2010 – 2012)	• Construct 185,000 square feet replacement research building (FIM 1) on site west of the Edwards Building along Pasteur Drive. • Demolish Edwards Building.
SoM - Phase 2 (FIM2) (2014 – 2016)	• Construct 120,000 square feet replacement research building (FIM 2) on the site of the demolished Edwards Building. • Demolish the Lane and Alway Buildings
SoM - Phase 3 (FIM3) (2018 – 2020)	• Construct 110,000 square feet replacement research building (FIM 3) on the site of the demolished Alway and Lane Buildings. • Demolish the Grant Building.
Hoover Pavilion Medical Office Building (2010 – 2012)	• Construct new parking structure. • Construct new medical office/clinic building.
Infrastructure (2009 - 2021)	• Construct infrastructure and utility upgrades and connections, including infrastructure delivery system for steam and chilled water from the CEF, widening of Welch Road, construction of Durand Way, and construction of onsite driveways and looproads.

Source: SUMC, 2010.

Table 2-13
SHC Construction Schedule, Equipment, and Staffing (Main SUMC Site)

Phase	Duration (Months)	Construction Equipment	Peak Number of Workers	Average Number of Workers (over duration)
New SHC Parking Garage (Late 2009 to Mid 2011)				
Demolition of 1101 Welch, Foundations and Below-Grade Work	6	Excavators, Drill Rig, Concrete Mixers, Pump Trucks, Delivery Trucks, Dirt Hauling Trucks, Misc. Diesel Engines	100	75
Super-Structure and Enclosure	10	Cranes, Concrete Mixers, Pump Trucks, Delivery Trucks, Misc. Diesel Engines	150	100
Interiors	2	Delivery Trucks, Generators, Misc. Diesel Engines	60	50
Existing Parking Garage 3 Demolition (Mid 2011 to Late 2011)				
Demolition	4	Excavators, Cranes, Delivery Trucks, Dirt Hauling Trucks, Misc. Diesel Engines, Misc. Concrete Saws/Impact Hammers	90	60
SHC Replacement Hospital (Late 2011 to 2015)				
Foundations and At-Grade Work	11	Excavators, Drill Rig, Concrete Mixers, Pump Trucks, Delivery Trucks, Dirt Hauling Trucks, Misc. Diesel Engines	700	500
Super-Structure and Enclosure	16	Cranes, Concrete Mixers, Pump Trucks, Delivery Trucks, Misc. Diesel Engines	800	600
Interiors	25	Delivery Trucks, Generators, Misc. Diesel Engines	1,100	800
Demolish Core Expansion, Boswell, East, West and Core Pavilions and Construct SHC Clinics Parking Garage (Early 2017 to Late 2019)				
Demolition, Foundations and At-Grade Work	30	Excavators, Drill Rig, Concrete Mixers, Pump Trucks, Delivery Trucks, Dirt Hauling Trucks, Misc. Diesel Engines, Demolition Hammers	200	120
SHC Clinics (Late 2019 to late 2021)				
Super-Structure and Enclosure	10	Cranes, Concrete Mixers, Pump Trucks, Delivery Trucks, Misc. Diesel Engines	240	185
Interiors	14	Delivery Trucks, Generators, Misc. Diesel Engines	340	200

Source: SUMC, 2010.

Table 2-14
LPCH Construction Schedule, Equipment, and Staffing

Phase	Duration (Months)	Construction Equipment	Peak Number of Workers	Average Number of Workers
LPCH Parking Structure (Mid-2009 to Late 2010)				
Demolition of 701 and 703 Welch, Foundations and below-Grade Work	4	Excavators, Drill Rig, Concrete Mixers, Pump Trucks, Delivery Trucks, Dirt Hauling Trucks, Misc. Diesel Engines	50	30
Super-Structure and Enclosure	12	Cranes, Concrete Mixers, Pump Trucks, Delivery Trucks, Misc. Diesel Engines	50	30
Interiors	2	Delivery Trucks, Generators, Misc. Diesel Engines	50	30
LPCH Expansion (Early 2010 to 2014)				
Foundations and At-Grade Work	10	Excavators, Drill Rig(s), Concrete Mixers, Pump Trucks, Delivery Trucks, Dirt Hauling Trucks, Misc. Diesel Engines	350	270
Super-Structure and Enclosure	14	Cranes, Concrete Mixers, Pump Trucks, Delivery Trucks, Misc. Diesel Engines	400	300
Interiors	18	Delivery Trucks, Generators, Misc. Diesel Engines	650	450
LPCH Clinic Building (incorporated into LPCH Expansion) (Early 2013 to 2014)				
Foundations and Below-Grade Work	12	Excavators, Drill Rig, Concrete Mixers, Pump Trucks, Delivery Trucks, Dirt Hauling Trucks, Misc. Diesel Engines	250	200
Super-Structure and Enclosure	6	Cranes, Concrete Mixers, Pump Trucks, Delivery Trucks, Misc. Diesel Engines	210	170
Interiors	12	Delivery Trucks, Generators, Misc. Diesel Engines	210	170

Source: SUMC, 2010.

Table 2-15
SoM Construction Schedule, Equipment, and Staffing

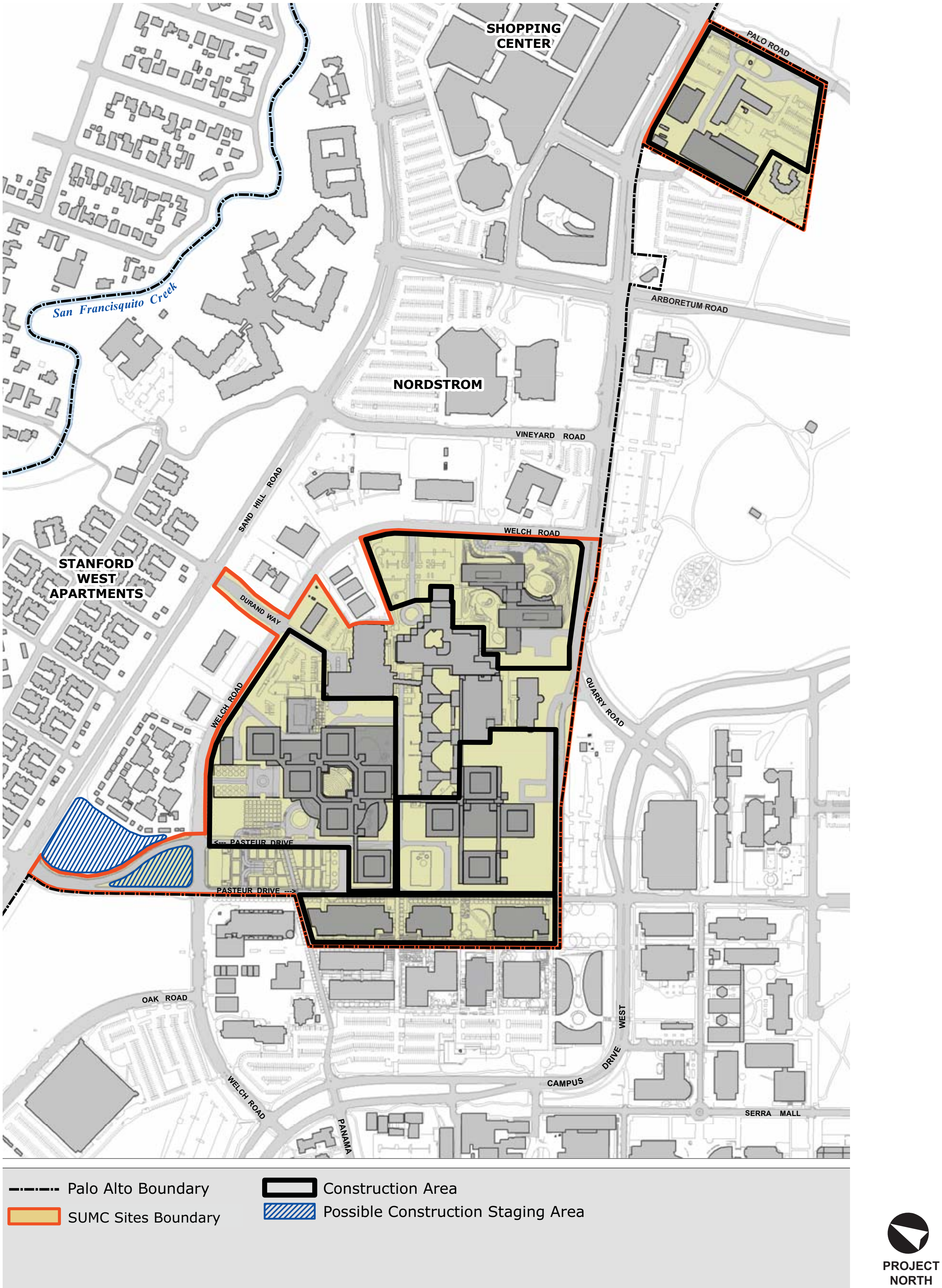
Phase	Duration (Months)	Construction Equipment	Peak Number of Workers	Average Number of Workers
FIM 1 (2010 to 2012), FIM 2 (2014 to 2016), and FIM 3 (2018 to 2020)				
Foundations and Below-Grade Work	8	Excavators, Drill Rig, Concrete Mixers, Pump Trucks, Delivery Trucks, Dirt Hauling Trucks, Misc. Diesel Engines	175	150
Super-Structure and Enclosure	8	Cranes, Forklifts, Concrete Mixers, Pump Trucks, Delivery Trucks, Misc. Diesel Engines	200	175
Interiors	8	Cranes, Forklifts, Delivery Trucks, Generators, Misc. Diesel Engines	250	225
Demolish Edwards Building (2013); Lane and Alway Buildings (2017); Grant Building (2021)				
Demolition	6	Excavators, Cranes, Delivery Trucks, Dirt Hauling Trucks, Misc. Diesel Engines, Misc. Concrete Saws/Impact Hammers	50	50

Source: SUMC, 2010.

Table 2-16
SHC Construction Schedule, Equipment, and Staffing (Hoover Pavilion Site)

Phase	Duration (Months)	Construction Equipment	Peak Number of Workers	Average Number of Workers
Hoover Pavilion Medical Office Building and Parking Garage (2010 to 2012)				
Demolish Existing Sheds, Foundations and Below-Grade Work	4	Excavators, Drill Rig, Concrete Mixers, Pump Trucks, Delivery Trucks, Dirt Hauling Trucks, Misc. Diesel Engines	200	140
Super-Structure and Enclosure	6	Cranes, Concrete Mixers, Pump Trucks, Delivery Trucks, Misc. Diesel Engines	200	140
Interiors	8	Delivery Trucks, Generators, Misc. Diesel Engines	200	140

Source: SUMC, 2010.



Source: PBS&J, 2009.

PBS&J

FIGURE 2-18
SUMC Project Construction Activities

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Stanford University Medical Center Facilities Renewal and Replacement Draft EIR

SoM. As shown in Table 2-15, the SoM research facilities (FIM 1, 2, and 3) would be phased so that construction and demolition of buildings alternated. The existing Edwards, Lane, Alway, and Grant Buildings would be demolished sequentially following the construction of each new FIM building.

Construction would start in late 2010 and would be completed by 2020. Construction of FIM 1 (from 2010 to 2012) would require approximately two years, followed by a six-month demolition of the Edwards building. FIM 2 would be built from 2014 to 2016, followed by a six-month demolition of the Lane and Alway buildings. Finally, FIM 3 would be built from 2018 to 2020, followed by the six-month demolition of the Grant building. An average of 150 to 225 construction workers would be on site during construction of the FIM buildings, and 50 workers would be on site for the subsequent demolitions.

Construction activity would be fenced in for the duration of construction and would generally be separated from hospital operations. As with SHC and LPCH construction, all construction worker parking for SoM would be planned off site for the entire construction period. Shuttle buses would bring the construction staff to and from the site.

There would be intermittent lane closures on Pasteur Drive, but the existing hospital entrance would be largely unaffected by the construction, except during demolition of the Edwards, Lane, Alway, and Grant Buildings.

Hoover Pavilion Site. As shown in Table 2-16, construction of the SHC medical office/clinic structure at the Hoover Pavilion Site would start in 2010 and end in 2012. From 2010 to 2012, an average of 140 construction workers would be on site.

Construction activity would be fenced for the duration of construction and would generally be separated from hospital operations. As with the other construction components, all construction worker parking for the Hoover Pavilion Site would be planned off site for the entire construction period. Shuttle buses would bring the construction staff to and from the site. No road closures are anticipated for the Hoover Pavilion Site construction.

Infrastructure Improvements

Throughout construction of the SUMC Project, infrastructure and utility upgrades and connections would occur. A description of the utility improvements for the SUMC Project are provided above in Section 2.5, Changes Proposed under the SUMC Project. These improvements would occur continuously, with a workforce of 25 to 30.

One of the largest components of this utility work is the infrastructure delivery system for the utilities generated from the CEF. The infrastructure delivery system consists of extending the underground steam tunnel and steam lines, and the extension of the existing chilled water loop along Welch Road to accommodate the new hospital facilities.

Construction work in Welch Road would start as soon as 2009. The improvements would require intermittent lane closures and traffic diversion on Welch Road and Quarry Road. All work would be fenced to protect the public from the construction operations. Construction worker parking would be off site at designated locations.

2.8 APPROVALS

SUMC Project

City Approvals

- Certification of this EIR;
- Approval of the Mitigation Monitoring and Reporting Program for the SUMC Project;
- Adoption of a Comprehensive Plan Amendment to redesignate portions of the SUMC Sites, as previously described in this section;
- Adoption of a Comprehensive Plan Amendment to Program L-3 to include language recognizing the SUMC as having special needs and that new Hospital zoning would allow buildings to exceed 50 feet in height;
- Adoption of a Comprehensive Plan Amendment to Policy L-8 exempting hospitals from the City-wide development cap;
- Preparation of the Stanford University Medical Center Area Plan, pursuant to Comprehensive Plan Program L-46;
- Creation of a new zone for the SUMC Sites in the Palo Alto Zoning Code, as previously described in this section;
- Conditional Use Permit, as previously described in this section.
- Amendment to Palo Alto Municipal Code Section 8.10 to recognize and cross reference with the Hospital District Ordinance.
- Annexation and prezoning of the property at the northwest corner of the Main SUMC Site, which is currently unincorporated, to the new zone;
- Rezoning of 701 and 703 Welch Road to the new zone discussed above;
- Architectural review for development of the SUMC Project, including design guidelines;
- Approval of a Development Agreement, if one can be mutually agreed upon by the City and SUMC Project sponsors;
- Issuance of a Grading and Excavation Permit;
- Issuance of a Grading/Dirt Hauling Approval;
- Issuance of one or more Demolition Permits;

- Issuance of one or more Building Permits; and
- Potential subdivision or lot line changes, if later requested.

Responsible Agency Approvals

Responsible agencies include all public agencies, other than the lead agency (in this case, the City of Palo Alto) that have discretionary approval power over a proposed project. Under CEQA, responsible agencies must consider this EIR prior to reaching a decision on the SUMC Project. Approvals from the federal, state, and local responsible agencies listed below apply to the SUMC Project.

- Regional Water Quality Control Board (RWQCB), coverage under the General Construction Permit by preparation of a NOI and SWPPP. Possible approval of an individual National Pollutant Discharge Elimination System (NPDES), if major dewatering is required;
- State of California, Office of Statewide Health Planning and Development (OSHPD), approval of construction for the acute care portions of the SUMC Project. SUMC Project plans would also need to be reviewed for compliance with fire safety codes by the State Fire Marshal;
- State of California, Department of Health Services (DHS), operating licenses;
- State of California, Department of Radiological Health Services (DRHS), design review and operating licenses of shielded areas;
- Bay Area Air Quality Management District (BAAQMD), approval of remediation of existing hazardous materials, operational ventilation related to hazardous materials and permit approvals for emergency generators and any other stationary sources: and
- Local Agency Formation Commission (LAFCO) approval of annexation.

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Section 3
Environmental Analysis

3.1 INTRODUCTION

Organization of this Section

This section of the Draft EIR presents an analysis of environmental impacts that may result from the City of Palo Alto (City) approval of the Stanford University Medical Center Facilities Renewal and Replacement Project (SUMC Project). The environmental analysis has been prepared consistent with Article 9 of the CEQA Guidelines (Section 15120 et seq.), which provides direction on the contents of an environmental impact report, including describing the existing environmental conditions and considering and discussing environmental impacts. For each issue, the following information is presented.

Existing Conditions

The Existing Conditions discussion describes existing conditions (baseline), including the environmental context and applicable regulatory background. In accordance with CEQA Guidelines Section 15125, the baseline consists of the physical environmental conditions in the vicinity of the SUMC Project, as they existed at the time the Notice of Preparation (NOP; see Appendix A) was published. The NOP for this Draft EIR was published on August 22, 2007 (see Section 1, Introduction, for a further discussion of the NOP process). A further discussion on what constitutes the baseline for each of the impact analyses is provided later, under Existing Conditions (Baseline).

Environmental Analysis

The Environmental Analysis identifies standards of significance (explained later under Classification of Impacts) and evaluates how the SUMC Project would affect the relevant physical environmental conditions in the vicinity. Significance conclusions and mitigation measures for project-level impacts and cumulatively considerable contributions to cumulative impacts are provided for the SUMC Project.

As discussed in Section 2, Project Description, the SUMC Project is expected to involve an approximately 12-year construction period, assumed here from late 2009 to 2021, with full utilization and occupancy anticipated by 2025. By 2015, construction of the Stanford Hospital and Clinics (SHC) and Lucile Packard Children's Hospital (LPCH) Hospital components are assumed to be completed. Other SUMC Project components that are assumed to be constructed by 2015 include the LPCH clinic component and parking garage, the SHC underground garage, the SoM's Foundations in Medicine (FIM) 1 building, and the clinic/medical office building and parking garage at the Hoover Pavilion Site. While these buildings may be completed at 2015, some of the structures that they replace, and that will be demolished would still be standing. This is because the new buildings must be completed and operational before the existing buildings can be demolished. Relocation of hospital, clinic, and research functions between new and old buildings could be in-progress at or around 2015. As the replacement medical facilities would need time to "ramp up" to projected levels of operation, the level of operation (employee and patient growth) at 2015 is generally estimated to be 60 percent of the net growth in activity anticipated at 2025 full buildout. The 60 percent level of operation would also occur under Reduced Intensity Alternative B, analyzed in Section 5, Alternatives.

Mitigation Measures

The Environmental Analysis discussions identify mitigation measures, which describe actions to avoid or minimize any impacts that are identified as significant. Per CEQA Guidelines Section 15126.4, aside from minimizing significant adverse impacts, mitigation measures must be feasible and fully enforceable through permit conditions, agreements, or other legally binding instruments.

Cumulative Analysis

After providing the impact from the SUMC Project, the Environmental Analysis provides a discussion of impacts from cumulative development, which includes the incremental impact of the SUMC Project plus other closely related present and reasonably foreseeable probable future projects. Cumulative impacts refer to "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental effects" (CEQA Guidelines Section 15355). An EIR is required to analyze cumulative impacts and propose feasible options for mitigating or avoiding a project's contribution to any significant cumulative impacts, if the project's contribution is "cumulatively considerable" (Public Resources Code Section 21083; CEQA Guidelines Section 15130).[1] The discussion of cumulative impacts reflects the severity of the impacts and their likelihood of occurrence.

CEQA Guidelines Section 15130(b) states that an EIR's analysis of cumulative impacts should be based on either a list of past, present, and probable future projects producing related impacts or a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document. The cumulative horizon applied to this analysis is 2025, as explained below. Also, in defining cumulative development up to 2025, this EIR relies on both a list of projects and growth projections, as explained below.

2025 Cumulative Horizon. The cumulative horizon for this analysis is the year 2025, which is consistent with the *Santa Clara Valley Transportation Authority Transportation Impact Analysis Guidelines* (VTA Guidelines). The VTA Guidelines require that cumulative analyses "...include expected growth until the project is expected to be available for final occupancy."[2] Because the 2025

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1 Cumulatively considerable means that "the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." CEQA Guidelines, Section 15065(a).

2 Santa Clara Valley Transportation Authority (SCVTA), *SCVTA Transportation Impact Analysis Guidelines*, May 1998, updated March 2004, p. 17.

year would capture full buildout, operation, and occupancy of the SUMC Project, this cumulative horizon is appropriate.[3]

Cumulative Development Assumptions. Cumulative impacts are analyzed within a geographic scope, based on the nature of the impact and resource or population being affected. For example, when addressing impacts on surface water quality within the San Francisquito Creek, 0.25 miles north of the Main SUMC Site, past, current, and probable future projects within the San Francisquito Creek watershed are considered because soil and pollutants from ground disturbance and project operations within the watershed could flow into San Francisquito Creek and cumulatively affect its water quality. The geographic scope for each cumulative impact discussion is described within the analysis sections.

Within the relevant geographic scope of each impact or resource, the cumulative development that is analyzed is identified through either a list of projects, growth projections, or both. For this EIR, the relevant list of projects is comprised of foreseeable projects within the City of Palo Alto. Growth projections are used in other instances and include forecasted growth in other cities, Stanford University's 2000 Community Plan and General Use Permit (CP/GUP), the Association of Bay Area Governments (ABAG) 2005 Projections, the Bay Area Air Quality Management District's (BAAQMD) air quality projections, the City of Palo Alto's Travel Demand Forecasting Model, and projections of various public service and utility providers for the SUMC Project.

List of Foreseeable Development in Palo Alto. The City has identified a list of foreseeable projects within Palo Alto. This list is provided in Appendix B and includes 65 distinct development projects, which include 1,250 new residential units and a decrease of 134,017 square feet of commercial land uses. There is a decrease in net new commercial square footage because Palo Alto is a built-out city and commercial land uses are being converted to residential land uses. Appendix B also provides a map depicting the locations of the projects within Palo Alto. As shown in this map, recently approved and pending projects in Palo Alto would be located east of El Camino Real, and the only such project in close proximity to the SUMC Project is a medical building at 777 Welch Road that would demolish an approximately 10,000-square-foot medical building and replace it with an approximately 35,000-square-foot medical building.

As stated in Section 1, Introduction, the Stanford Shopping Center is not considered a reasonably foreseeable development project in the City. In 2007, the Simon Property Group submitted an application to expand the Stanford Shopping Center and construct a boutique hotel.[4] Stanford University owns the property occupied by the Stanford Shopping Center, and the Simon Property Group leases this property from Stanford University and operates the Stanford Shopping Center. As such, the application was submitted with the approval of Stanford University. However, this application was withdrawn in April 2009. Given Stanford University's statement that it intends to

3 Shanthi Ganji, Assistant Transportation Engineer, SCVTA, personal communication with PBS&J, November 6, 2007.

4 Simon Property Group, "Simon Properties – Stanford Shopping Center Expansion Application," August 20, 2007.

focus its development efforts on the SUMC Project,[5] and due to the current economic downturn and changing retail trends, the scope of any future development at the Stanford Shopping Center is too speculative to analyze at this point. Therefore, the Stanford Shopping Center expansion is not considered a probable future project for the purposes of the discussion of cumulative impacts per CEQA Guidelines Section 15130.

Stanford University CP/GUP.[6,7,8] The Stanford University 2000 CP/GUP cover Stanford's lands in unincorporated Santa Clara County (County). The CP is part of the County's General Plan and will remain in place until modified or replaced by the County. The GUP was intended to govern development on Stanford University lands for at least ten years, but also has no actual time limit. Because these land use documents govern development within the County, and not lands within Palo Alto city limits, they currently apply to only a 0.75-acre portion of the SUMC Project Site. The GUP allows an amount and type of development, which has been determined to be consistent with the CP. GUP development includes:

- New academic facilities totaling approximately 2,035,000 net new square feet, which includes academic, academic support, student activity, cultural and athletic facilities;
- 3,018 housing units including:
    - 2,000 housing units for graduate and undergraduate students on sites identified in the GUP and Community Plan Housing Element;
    - 350 housing units for hospital residents and post-graduates on two sites identified in the Community Plan Housing Element and GUP. These housing sites are located on parcels at Quarry Road and El Camino Real, and at Quarry Road and Arboretum Drive, immediately east and west of the Hoover Pavilion Site, respectively;
    - 668 housing units for faculty and staff, based on low-density (1 to 8 units per acre) and moderate density (8 to 15 units per acre) zoning on sites identified in the Community Plan Housing Element and County zoning code;
- 2,300 additional parking spaces; and
- Associated utilities, access roads, bikeways, landscaping, and other requisite infrastructure.

Of the development under the CP/GUP, the following sites are expected to undergo construction concurrently as the SUMC Project: Li Ka Shing Center for Learning and Knowledge (current to 2010); Lorry I. Lokey Stem Cell Research Building (current to 2010); the Center for Nanoscale

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5 Barbara Schussman, Bingham McCutchen LLP, Letter to Cara Silver, Senior Assistant City Attorney, April 16, 2009.

6 *Stanford University Draft Community Plan and General Use Permit Application, Final Environmental Impact Report*, Certified by the Santa Clara County Board of Supervisors, December 2000.

7 Santa Clara County Planning Office, *Stanford University Community Plan*, adopted by the Santa Clara County Board of Supervisors December 12, 2000.

8 Santa Clara County Planning Office, *Stanford University General Use Permit,* December 2000.

Science and Technology (current to 2010); Huang Engineering Center (current to 2010); and Bioengineering/Chemical Engineering (2011 to 2013).

Caltrain Electrification Project and California High Speed Train Project. The cumulative scenario also includes the Caltrain Electrification project and the California High Speed Train (HST) project. The Caltrain Electrification project would convert the existing Caltrain line from the current diesel locomotive trains to a fully electric rolling stock. To accomplish this, the Caltrain Electrification would include the installation of an overhead contact system for the distribution of electrical power to the electric-powered vehicles. The HST project would also require a contact system, similar to the Caltrain Electrification project, and the two projects are coordinating on the use of the same system, since both have the same infrastructure requirements.

Within the City of Palo Alto, the HST project would construct additional tracks along the existing Caltrain tracks within the existing Caltrain right-of-way to the extent feasible for high speed rail operations that would offer regional transportation between San Francisco and Los Angeles. The right-of-way needed to accommodate the additional tracks is uncertain at this time. Based on the California High-Speed Rail Authority's California's Federal Stimulus Application Fact Sheet, construction of the HST project may begin in 2012, pending issuance of a Record of Decision.[9] Although construction may begin in 2012, there is uncertainty in the construction schedule for the segment between San Jose and San Francisco and will most likely occur later than 2012. While plans for the HST project are being developed, conceptual alignments have been presented to the City of Palo Alto by the High Speed Rail Authority.[10] That is, the City has participated with the High-Speed Rail Authority in a number of meetings since October 2009 to review and discuss conceptual alternative alignments. The conceptual alignments showed that the proposed HST tracks could be either at the same grade as the existing Caltrain tracks or below grade. Below grade options include constructing the tracks in a trench or a tunnel. The HST project would also require a contact system, similar to the Caltrain Electrification project, and the two projects are coordinating on use the same system, since both have the same infrastructure requirements.

From San Francisco to San Jose, preferred HST station locations have been identified in the City of San Francisco, at the Transbay Transit Center; in the City of Millbrae, at the existing Millbrae BART/Caltrain station; and in the City of San Jose, at the Intermodal Diridon station. Potential station locations are being reviewed for the City of Redwood City at the existing downtown Caltrain station; the City of Palo Alto, at the existing Caltrain Intermodal Transit station; and the City of Mountain View, at the existing Caltrain/VTA LRT station. It is possible that one or none of these optional stations could be selected as part of the HST project. However, as of the preparation of this document,

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9 California High Speed Rail Authority, http://www.cahighspeedrail.ca.gov/news/Oct2FactSheet.pdf, accessed October 2009.

10 The California HST project will be planned, designed, constructed, and operated under the direction of the High Speed Rail Authority, a State governing board formed in 1996. The Authority's statutory mandate is to develop a high-speed rail system that is coordinated with the State's existing transportation network, which includes intercity rail and bus lines, regional commuter rail lines, urban rail and bus transit lines, highways, and airports.

construction of a HST station in Palo Alto is speculative and is not considered a probable future project. As such, a HST station in Palo Alto is not included in the cumulative analysis.

Palo Alto Citywide Transportation Model. The City of Palo Alto Travel Demand Forecasting Model projects increases in traffic in 2015, 2025, and 2030 based on forecasted growth within Santa Clara County and San Mateo County. The projections from this model are used to determine the future without project and cumulative traffic conditions, and without project and cumulative traffic noise and local concentrations of air pollutants. The key inputs to the model are the estimated growth in commercial and residential development, and the planned and programmed infrastructure improvements (roads, public transit, bicycle, and pedestrian facilities) that would occur between the existing and future years. Based on these assumptions, the model forecasts the amount of vehicular traffic that would use each of the roadway segments, freeway segments, and intersections; the number of passengers that would use the public transit routes; and the number of bicyclists and pedestrians that would use the trails and paths that are being analyzed under the Transportation Impact Analysis for the SUMC Project (see Section 3.4, Transportation).

Other Growth Projections. Other growth projections applied to the analysis include:

- The *City of Palo Alto Utilities 2005 Urban Water Management Plan*, to project cumulative water consumption in the City, as well as to project total wastewater collected and treated by the Regional Water Quality Control Plant.
- City of Palo Alto Utilities (CPAU) division projections for solid waste generation, which is a one percent growth rate of solid waste generation annually.
- The CPAU's electricity and natural gas projections, to project the City's cumulative energy demand.
- Statewide greenhouse gas projections from the *California Inventory of California Greenhouse Gas Emissions and Sinks* and citywide greenhouse gas projections from the *Palo Alto Climate Protection Plan*. These were compared to inventories prepared for the SUMC Project by PBS&J, Stanford University, and Mazzetti and Associates to estimate the SUMC Project's contributions to cumulative greenhouse gas emissions.
- Projections pertaining to the wholesale water supply and future water supply availability from the San Francisco Public Utilities Commission.
- Lapkoff & Gobalet Demographic Research's *District-Wide Enrollment Forecasts* of the Palo Alto Unified School District from 2008 to 2025, to project cumulative school enrollment.

Existing Conditions (Baseline)

An EIR must describe the physical conditions and environmental resources within a project site and in the project vicinity, and evaluate the potential effects of the project, individually and cumulatively on those physical conditions and resources (see CEQA Guidelines Section 15125):

> An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant.

Furthermore, CEQA Guidelines Section 15126.2(a) explains that:

> In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area as they exist at the time the notice of preparation is published, or where no notice of preparation is published, at the time environmental analysis is commenced.

The SUMC Sites, wherein the SUMC Project would be built (see Figure 2-5 in Section 2), are developed with approximately 2.37 million square feet of hospital, clinic/medical office, and medical research space (see Table 2-1 in Section 2). Of this developed space, approximately 2.27 million square feet are within the Main SUMC Site and approximately 105,400 square feet are within the Hoover Pavilion Site. Broken out according to land use, the 2.37 million square feet at the SUMC Sites includes approximately 1.06 million square feet of hospital space, approximately 738,700 square feet of clinic/medical office space, and approximately 467,200 square feet of medical research/laboratory space.[11]

The environmental setting used for purposes of this EIR thus includes the current uses of the SUMC Sites and their associated vehicle trip generation (and related noise and air quality impacts), demand for services and utilities, visual character, and other ongoing environmental conditions. The environmental setting also includes surrounding uses and conditions, as identified in each section of the EIR. This environmental setting represents the baseline against which impacts are measured for most environmental topics in this EIR. However, in some instances where deemed more appropriate (such as but not limited to traffic), the baseline has been adjusted to reflect conditions as they would exist in the future without the SUMC Project in light of on-going expected changes to the existing setting. Impacts from the SUMC Project include the net new effects of development and operations plus the impacts of demolition and construction.

Classification of Impacts

The discussion of each particular environmental resource includes an impact statement that highlights the environmental consequences of the SUMC Project with regard to that environmental topic. An explanation of each impact and an analysis of its significance follow the impact statement. For each impact, a level of significance is determined and is reported in the impact statement.

[11] In addition to the uses identified, about 13,800 square feet of shops/storage uses and about 7,400 square feet of children's care space are extant at the Hoover Pavilion Site.

Conclusions of significance are defined as follows:

- Significant (S) impacts include effects that exceed identified thresholds. For example, project traffic volumes that cause local intersection level-of-service standards to be exceeded would be considered a significant impact.
- Less-than-significant (LTS) impacts include adverse effects that would be caused by a proposed project, but do not exceed established or defined thresholds. For example, a proposed project could trigger an increased demand for public utilities, but such an increase in infrastructure requirements would not exceed the available capacity or service levels such that new facilities would need to be constructed. Therefore, the effect would be considered less than significant.
- No Impact (NI) is used when a proposed project would not have an adverse effect on a particular environmental resource category.

For each impact identified as being significant (S), the EIR considers whether feasible mitigation measures are available to avoid or minimize the impact. If the mitigation measures would reduce the impact to a less-than-significant (LTS) level, this is stated in the EIR. If the mitigation measures would not reduce the impact to a less-than-significant level, or if no feasible mitigation measures have been identified, the EIR classifies the impact as "significant and unavoidable (SU)."

Thresholds or significance criteria are used to classify an impact into one of the above categories. These significance criteria are defined for each environmental topic, based on standards selected by the City of Palo Alto. These significance criteria provide the basis for determining the significance of an impact. The Palo Alto City Council has not formally adopted local significance criteria, but over the past few years the City has developed and utilized the criteria based on the CEQA Guidelines, guidance from other agencies, and current City policy. The thresholds of significance identified in this document are based upon the same thresholds that are or have been used in other major City environmental documents, although the City continues to refine these thresholds to ensure that they address all potential environmental impacts.

Enumeration of Impacts and Mitigation

Each impact topic is numbered using an alpha-numerical system that identifies the environmental issue. For example, *TR-1* denotes the first impact discussion in the Transportation subsection. The following two-letter codes are used to identify the environmental issues discussed in this section:

- LU – Land Use and Planning
- VQ – Visual Quality and Aesthetics
- TR – Transportation
- AQ – Air Quality
- CC – Climate Change
- NO – Noise
- CR – Cultural Resources
- BR – Biological Resources
- GS – Geology, Soils, and Seismicity
- HY – Hydrology
- HM – Hazardous Materials
- PH – Population and Housing
- PS – Public Services
- UT – Utilities and Service Systems, including Energy

Mitigation measures are numbered to correspond to the impacts they address; e.g., Mitigation Measure TR-3.1 refers to the first mitigation measure for Impact 3 in the Transportation subsection. A brief title is included to easily identify the mitigation measure.

CEQA Methodology

CEQA Guidelines Section 15151 provides guidance for the preparation of an adequate EIR. Specifically, Section 15151 states:

- An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences;
- An evaluation of the environmental impacts of a project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible; and
- Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts.

In practice, the above points mean that EIR preparers should adopt a reasonable methodology upon which to estimate impacts. This approach means making reasonable assumptions using the best information reasonably available.

Types of Effects and Impacts

Pursuant to CEQA Guidelines Section 15126.2, consideration of direct and indirect physical impacts of a project is required in determining the significance of the project's impacts. The types of physical impacts, and examples of these types of impacts, associated with the SUMC Project, are listed below.

Footprint Impacts. The SUMC Project would involve demolition of approximately 1.2 million square feet of existing hospital, medical office/clinic, and research/laboratory facilities and construction of approximately 2.5 million square feet of replacement and expanded facilities, thereby increasing on-site developed space by approximately 1.3 million square feet. Parking facilities would also be constructed. The building footprint plus the land to be occupied or disturbed during construction comprise the SUMC Project's footprints.

From the size and location of the SUMC Project's footprints, the EIR identifies whether the SUMC Project would encroach into biologically sensitive areas, encroach into areas subject to flooding or severe groundshaking, or disturb cultural resources, for example. These so-called footprint impacts are derived from the increase in floor area, changes in the facilities' spatial arrangement on the SUMC Sites, and environmentally sensitive or contaminated areas to be disturbed or occupied by construction activities.

Impacts to Ambient Conditions. Ambient conditions refer to the background transportation, air quality, and noise conditions surrounding the SUMC Project's footprints. Transportation impacts are those that involve changes to the flow or service levels of access ways within and around a project site.

Transportation impacts are dependent on the level of activity within the SUMC Project footprint, points of ingress and egress, and the location and number of outsiders traveling to, from, and past the SUMC Sites. Projections of transportation impacts during the SUMC Project's construction and operation are important considerations in estimating the projected change to ambient air quality and noise levels around the SUMC Sites. The air quality and noise analyses also consider the impacts of construction activities, such as demolition of existing structures and the impacts of projected future activities associated with proposed land uses.

Indirect Environmental Impacts. Because the SUMC Project includes expansions in developed space and increased employment on site, the demand on utilities and public services, and housing supply associated with employment, hazardous materials usage, and the generation of hazardous waste, including medical waste, could change from existing levels. For purposes of this EIR, increased utilities and public services demand, hazardous materials usage, and waste generation are assumed to be correlated to the net increase in developed floor space or employment or the number of hospital beds, unless other information has been provided by the City or SUMC Project sponsors. Increased housing demand is assumed to be correlated with both increased employment and statistical commute patterns of employees (see Section 3.13, Population and Housing).

Economic and Social Impacts. Under CEQA, economic and social effects of a proposed project are not required to be evaluated. However, if the social or economic effects would lead to physical environmental effects, then such effects would need to be analyzed and addressed in the EIR. Section 15131 of the CEQA Guidelines states the following specific ways that economic or fiscal effects may be considered as part of the EIR:

- Economic or social effects of a proposed project shall not be treated as significant effects on the environment. An EIR may trace a chain of cause and effect from a proposed decision on a proposed project through anticipated economic or social changes resulting from the proposed project to physical changes caused in turn by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes.

- Economic or social effects of a proposed project may be used to determine the significance of physical changes caused by the proposed project.

- Economic, social, and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a proposed project are feasible to reduce or avoid the significant effects on the environment identified in the EIR.

3.2 LAND USE

Introduction

EIR analyses of land use and planning generally consider the compatibility of a project with neighboring areas, change to or displacement of existing uses, and consistency of a project with relevant local land use policies that have been adopted with the intent to mitigate or avoid an environmental effect. With respect to land use conflicts or compatibility issues, the magnitude of these impacts depends on how a project affects the existing development pattern, development intensity, local air quality, noise, and visual setting in the immediately surrounding area. Specific environmental-related issues (visual, air quality, noise, etc.) and their potential significance are discussed in detail in the associated topical sections of this EIR (such as Section 3.3, Visual Quality, Section 3.4, Transportation; Section 3.5, Air Quality; and Section 3.6, Noise).

Appendix G to the CEQA Guidelines suggests that an EIR consider whether a project may conflict with any applicable land use plan, policy, or regulation (including, but not limited to the general plan, specific plan, or zoning ordinance) that was adopted for the purpose of avoiding or mitigating an environmental effect (see Appendix G to the CEQA Guidelines). This section thus discusses the consistency of the SUMC Project with applicable policies of the *City of Palo Alto 1998 Comprehensive Plan* (Comprehensive Plan), the *Palo Alto Land Use Designation Map* (Land Use Map), the *City of Palo Alto Municipal Code, Title 18 Zoning Ordinance* (Zoning Ordinance), and the *City of Palo Alto 2007 Zoning Map* (Zoning Map). The *2000 SUMC Area Plan* and the *2007 SUMC Area Plan Update* are also discussed as they apply to the SUMC Sites.

Issues identified in response to the Notice of Preparation (NOP) and during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project were considered in preparing this analysis.[1] Applicable land use issues that were identified during the scoping period pertain to the modification of existing zoning and land use designations and to mitigation of the environmental impacts that might result from such actions. These issues are considered in this section. No public agencies submitted comments specific to land use topics.

Existing Conditions

The subsequent paragraphs document the land uses and development intensities in the Project Vicinity, defined below. The land use and zoning designations of the Project Vicinity are discussed under Applicable Plans and Regulations, later in this section.

[1] The December 2007 Scoping Report for this EIR process lists the NOP comments received during the scoping period. The Scoping Report is available for review with the Palo Alto Department of Planning & Community Environment.

Project Vicinity

The Project Vicinity is generally bounded by San Francisquito Creek to the north, El Camino Real to the east, the parcels adjacent to Quarry Road (for example, Hoover Pavilion) to the south, and SUMC to the west. The Project Vicinity generally follows "Area 9" under General Plan Policy L-8 (see description below), except that it also includes open space parcels that are east and west of the Hoover Pavilion Site and that are within Santa Clara County jurisdiction, as part of the larger Stanford University campus. As such, the Project Vicinity generally comprises a distinct planning area within the City. The Project Vicinity is near the border of the cities of Palo Alto and Menlo Park, which is formed by San Francisquito Creek. The portion of El Camino Real that crosses San Francisquito Creek near the Project Vicinity is considered an important gateway into the City. The Project Vicinity is also close to the regional-serving Palo Alto Intermodal Transit Station (PAITS) and downtown Palo Alto.

The Project Vicinity includes both SUMC Sites, which support medical uses (hospital, clinic, and medical research). The Project Vicinity also includes the Stanford Shopping Center, which supports commercial (retail and restaurant) uses; other retail and commercial uses (such as banks and personal services); clinics and medical offices; and multiple-family residential uses, including the Stanford West Apartments and 1100 Welch Road apartments along Sand Hill Road.

Residential uses adjacent to the Project Vicinity include the Hyatt Classic Residences (an independent living, assisted care, and skilled nursing facility) on El Camino Real and the Ronald McDonald House on Sand Hill Road. Single-family residences occur just north of San Francisquito Creek in Menlo Park. East of the Caltrain tracks in downtown Palo Alto are various uses: multiple-family housing interspersed with local commercial uses to the northeast, and a larger commercial corridor centered on University Avenue to the southeast.

Just west and south the Project Vicinity is the larger Stanford University campus. Land uses on the portions the campus just west and south of the Project Vicinity include undeveloped open space areas that are reserved for future academic or supporting uses, and academic uses.

SUMC Sites

The SUMC Sites include the Main SUMC Site and the Hoover Pavilion Site, as explained in Section 2, Project Description. The SUMC is a major medical center that serves a local, regional, and international service area. It includes an emergency trauma center, inpatient care, outpatient treatment, and educational and research facilities. The Main SUMC Site is owned by Stanford University, which leases portions of the site to SHC and LPCH for their hospitals (see Figure 2-4 in the Project Description).

Figure 2-5 in Section 2, Project Description, provides the existing site plan for both SUMC Sites, including the Main SUMC Site and the Hoover Pavilion Site. The Main SUMC Site and the Hoover Pavilion Site collectively have an area of approximately 66 acres. The SUMC Sites are developed with approximately 2.37 million square feet of hospital, clinic/medical office, medical research space, plus other minor uses (see Table 2-1 in the Project Description). Of this developed space, approximately 2.27 million square feet are located within the Main SUMC Site, and about 105,400 square feet are within the Hoover Pavilion Site. Divided according to land use, the 2.27 million square feet at the Main SUMC Site includes approximately 1.39 million square feet of SHC Hospital uses; about 274,700 square feet of LPCH Hospital and clinic uses; approximately 467,200 square feet of SoM uses; and about 132,600 square feet jointly used by the hospitals and community practitioners (at Welch Road). Further development details on the Main SUMC Site and Hoover Pavilion Site are provided under the subheadings below.

Main SUMC Site. The Main SUMC Site is bounded by Welch Road to the north and east, and unincorporated Santa Clara County to the south and west. Surrounding uses include multiple-family residential uses (the Stanford West Apartments and 1100 Welch Road Apartments) to the north, the Stanford Shopping Center and office/medical clinic uses to the east, and institutional/university uses to the south and west (the main campus of Stanford University). San Francisquito Creek also runs parallel to Sand Hill Road to the north of the Main SUMC Site, along the Palo Alto/Menlo Park border.

The land area at the Main SUMC Site totals approximately 56 acres. There are several structures at the Main SUMC Site, totaling about 2.27 million square feet. Habitable structures are listed in Table 2-1 of the Project Description. Of the 2.27 million square feet of floor space within the Main SUMC Site, about 1.45 million square feet are owned by the Stanford Hospital and Clinics (SHC), 354,500 square feet are owned by the Lucile Packard Children's Hospital (LPCH), and about 467,200 square feet are owned by the Stanford University School of Medicine (SoM). Parking at the Main SUMC Site is provided at surface lots, above-ground garages, and underground garages. Structures within the Main SUMC Site vary in height from approximately 15 feet to approximately 50 feet (excluding rooftop appurtenances).

The land use and zoning designations of the Main SUMC Site are described under Applicable Plans and Regulations, later in this section. Generally, portions of the site are zoned Public Facilities (PF) and Medical Office and Research (MOR). The allowed floor area ratio (FAR) is 1.0 in the PF zone and 0.5 in the MOR zone (i.e. the medical office/clinic area along Welch Road). The existing FAR is 1.0 in the PF zone and 0.43 in the MOR zone.

Hoover Pavilion Site. The Hoover Pavilion Site, east of the Main SUMC Site at 211 Quarry Road, is directly bounded to the north by Quarry Road, to the east and south by undeveloped land, and to the west by a surface parking lot. Surrounding land uses include the Shopping Center Site to the north, undeveloped land within the Stanford University campus to the east, south, and west. El Camino Real, (State Route 82), runs roughly 430 feet east of the Hoover Pavilion Site.

As shown in Table 2-1 of the Project Description, the approximately 105,400 square feet at the Hoover Pavilion Site is broken into about 84,200 square feet of medical office space, 13,800 square feet of shops and storage space, and approximately 7,400 square feet of childcare space (Arboretum Children's Center). The allowed FAR at this site is 0.25, and the existing structures cover about 9.5 percent of the site's total 9.9-acre area. The Hoover Pavilion Site contains surface parking, and no parking structures. Existing building heights within the Hoover Pavilion Site range from approximately 12 feet to 65.5 feet (excluding rooftop appurtenances).

Applicable Plans and Regulations

Palo Alto Comprehensive Plan

The *City of Palo Alto 1998 Comprehensive Plan* contains the City's goals, objectives, policies, and programs for growth and development. It utilizes written policies and mapped land use designations to shape development within the City.

Goals and Policies. Comprehensive Plan goals and policies that pertain to the development of the SUMC Project and that were adopted for the purpose of avoiding or mitigating an environmental impact are presented in Table 3.2-2; this table also provides a consistency analysis in accordance with the significance criteria listed later in this section.

Land Use Designations. Land use designations from the Comprehensive Plan for the SUMC Sites and the surrounding vicinity are summarized in Table 3.2-1. Land use designations for the SUMC Sites are shown in Figure 2-2 (see Chapter 2, Project Description). The majority of the Main SUMC Site and the Hoover Pavilion Site is designated for Major Institution/Special Facilities uses. A 0.75-acre area near the western border of the Main SUMC Site is within unincorporated Santa Clara County and is designated for Major Institution/University Lands/Campus Education Facilities. This 0.75-acre area is also included in the Santa Clara County General Plan's land use map. The designated land use for this area under the Santa Clara County General Plan is discussed below.

Comprehensive Plan Policy L-8 addresses growth in non-residential square footage for nine planning areas evaluated in the 1989 Citywide Land Use and Transportation Study. As discussed below, the SUMC Project includes an amendment to Policy L-8 to specify that Policy L-8 does not apply to growth in square footage in areas zoned Hospital District.

Palo Alto Municipal Code, Title 18 Zoning Ordinance

Title 18 of the Palo Alto Municipal Code, the City's Zoning Ordinance, sets forth development regulations for each parcel within the City. Table 3.2-1 summarizes the zoning for the SUMC Sites. Zoning for the SUMC Sites is shown in Figure 2-3 in Section 2, Project Description. The Hoover Pavilion Site and the majority of the Main SUMC Site are zoned as Public Facilities (PF) districts. A small portion of the Main SUMC Site falls within the Medical Office and Research (MOR) district.

Stanford University Medical Center Area Plan

The SUMC Area Plan serves as a guiding document for development on the Main SUMC Site, the Hoover Pavilion Site, and other sites in the vicinity by providing information about future plans for those sites. The boundaries of the SUMC Area Plan are depicted in Figure 2-1 in Section 2, Project Description. It is important to note that the SUMC Area Plan is not a regulatory document and does

Table 3.2-1
Existing Palo Alto Comprehensive Plan Land Use Designations and Zoning for SUMC Sites and Vicinity

Location	Zoning District	Comprehensive Plan Land Use Designation	Description of Zoning District	Description of Comprehensive Plan Land Use Designation
SUMC Sites				
Main SUMC Site – area roughly bounded by Quarry Road, Welch Road and Pasteur Drive	Public Facilities (PF)	Major Institution/Special Facilities	The PF District is designed to accommodate governmental, public utility, educational, and community service or recreational facilities. There are no minimum setbacks; however, maximum site coverage is 30 percent, and maximum heights are 50 feet. FAR is 1.0.	Institutional, academic, governmental, and community service uses and lands that are either publicly owned or operated as non-profit organizations. Examples are hospitals and City facilities. Hospitals are a conditional use.
Main SUMC Site – half-acre area adjacent to 800 Welch Road and four-acre area at the corner of Welch Road and Quarry Road	Medical Office and Research (MOR)	Research/ Office Park	The MOR District allows medical offices, research facilities and some support services. Minimum setbacks range from 10 to 50 feet, maximum site coverage is 30 percent, and maximum heights are 50 feet. FAR is 0.5.	Office, research, and manufacturing establishments whose operations are buffered from adjacent residential uses. Stanford Research Park is an example. The MOR zoning for the SUMC Site allows FAR up to 0.5.
Main SUMC Site –area proposed for annexation on Pasteur Drive	A1	Major Institution/ University Lands/ Campus Educational Facilities	The A1 district provides a flexible base zoning district that allows general residential and agricultural uses, and provides opportunities through the use permit process for other uses and developments that are appropriate for a particular location, consistent with the objectives, goals and policies of the general plan.	Academic lands with a full complement of activities and densities that give them an urban character. Allowable uses are academic institutions and research facilities, student and faculty housing, and support services. Increases in student enrollment and faculty/staff size must be accompanied by measures that mitigate traffic and housing impacts.
Hoover Pavilion Site (211 Quarry Road)	PF	Major Institution/Special Facilities	See above. FAR is 0.25.	See above

Source: City of Palo Alto, 2007, Zoning Ordinance; City of Palo Alto, 1998, Comprehensive Plan; County of Santa Clara, 2008, Zoning Ordinance and Zoning Map.

not comprise a coordinated area plan or specific plan under the City's Municipal Code.[2] It was prepared pursuant to Program L-46 of the Comprehensive Plan as a guidance document for future development at the SUMC Sites.

The City of Palo Alto, in collaboration with Stanford University, SHC, and LPCH, prepared the SUMC Area Plan in 2000. In 2007, the SUMC Project sponsors initiated an update of the SUMC Area Plan (2007 Update) to address expansion of its existing hospital, clinic/medical office, and research facilities. To support these planning efforts, the City proposed a list of planning objectives, which are included in Chapter 1 of the 2007 Update. Chapter 3 of the 2007 Update also contains several polices suggested by the SUMC Project sponsors in response to existing Comprehensive Plan policies. Objectives suggested by the SUMC Project sponsors in the 2007 Update are essentially the same as the project objectives listed in this EIR's Section 2, Project Description (with the exception of the design policies discussed in Chapter 3 of the 2007 Update). The 2007 Draft Update also includes the land uses proposed under the SUMC Project. In general, the SUMC Area Plan will evolve to reflect the expansion plans for the Stanford University Medical Center. The City Council accepted the 2007 Update in July 2007.

Citywide Land Use and Transportation Study

The Citywide Land Use and Transportation Study, completed in 1989, analyzes growth and circulation impacts within nine study areas. As discussed previously, the Project Vicinity, including the SUMC Sites, is generally within Study Area 9.

The primary focus of the Citywide Land Use and Transportation Study was to address community concerns about deteriorating traffic conditions resulting from new commercial and industrial development. The secondary focus was to identify areas suitable for mixed-use, hotel development or housing projects. The study recommended changes to the City's adopted development regulations (those regulations that were in place at the time that the study was published) to minimize future traffic congestion; these changes have been incorporated into present-day zoning and land use designations.

The study itself does not contain binding policies, except as adopted under the Comprehensive Plan. Policy L-8 in the Comprehensive Plan directs the City to maintain a limit of 3,257,900 square feet of new non-residential development within the nine planning areas evaluated in the 1989 Citywide Land Use and Transportation Study (over 1989 levels), with the understanding that the City Council may make modifications for specific properties that allow modest additional growth. The study anticipated the total additional potential non-residential floor area within Study Area 9 at 121,800 square feet.[3] Although on a citywide basis there is 2,367,442 square feet of development potential remaining under

2 City Manager, City of Palo Alto, report to the City Council, Subject: Review of the Draft Update to the Stanford University Medical Center Area Plan and Related Planning Issues for the Stanford University Medical Center and Shopping Center Projects, July 23, 2007.

3 Roland Rivera, Senior Planner, City of Palo Alto, electronic communication with Randi Adair, PBS&J, September 29, 2008.

the Comprehensive Plan development cap, non-residential development in Study Area 9 has exceeded the anticipated growth by 6,966 square feet.[4]

As described in Section 2, Project Description, the City has proposed a Comprehensive Plan Amendment to provide clarification of Policy L-8. The City planning staff has concluded, based on review of the legislative history, that the policy was not intended to limit growth of hospital and treatment center uses. The Comprehensive Plan Amendment, if adopted by the City Council, would modify the text of Policy L-8 to clarify that areas zoned within the Hospital District are exempt under this policy.

Stanford General Use Permit

The 2000 Stanford General Use Permit (GUP) for Stanford University, as approved by Santa Clara County, allows new development on the Stanford University campus of up to 2,035,000 square feet of new academic and academic support uses and up to 3,018 net new housing units (beyond the development levels that existed when the permit was issued in 2000). The GUP pertains only to land within unincorporated Santa Clara County, and does not include lands within the jurisdiction of the City of Palo Alto. Therefore, within the SUMC Project sites, the GUP currently applies only to a small portion of the Main SUMC Site, which is the 0.75-acre parcel that would be annexed into City boundaries for expansion of the SoM facilities. After annexation as part of the SUMC Project, the GUP would no longer cover this 0.75-acre area.

Stanford University Community Plan

The Stanford University Community Plan was approved by Santa Clara County as a means of governing unincorporated Stanford University lands within the jurisdiction of Santa Clara County. The Stanford University Community Plan was adopted by Santa Clara County as an amendment to the Santa Clara County General Plan in 2000. The SUMC Sites are within the jurisdiction of the City of Palo Alto, except for a 0.75-acre area at the Main SUMC Site that is currently within the County. This area would be annexed into City boundaries under the SUMC Project. Thus, the Stanford University Community Plan land use designations and policies do not apply to the SUMC Project. No further discussion of this plan is included in this EIR.

Impacts and Mitigation Measures

Standards of Significance

Based on significance thresholds determined by the City of Palo Alto, the SUMC Project would result in a significant land use impact if it would:

[4] Roland Rivera, Senior Planner, City of Palo Alto, electronic communication with Randi Adair, PBS&J, September 29, 2008.

- Conflict with any applicable City land use plan, policy, or regulation (including, but not limited to the Comprehensive Plan, coordinated area plan, or the City's Zoning Ordinance) adopted for the purpose of avoiding or mitigating an environmental effect;
- Be incompatible with adjacent land uses or with the general character of the surrounding area, including density and building height;
- Conflict with established residential, recreational, educational, religious, or scientific uses of an area;
- Physically divide an established community;
- Convert prime farmland, unique farmland, or farmland of statewide importance (farmland) to non-agricultural use; or
- Otherwise adversely change the type or intensity of overall existing or planned land use patterns in the area.

Environmental Analysis

LU-1. Conflicts with Adopted Land Use Plans and Policies. Without mitigation measures to ensure consistency with the Comprehensive Plan's policies adopted for the purpose of avoiding or mitigating an environmental effect, the SUMC Project could conflict with Comprehensive Plan policies that avoid or reduce impacts related to visual quality, cultural resources, pedestrian circulation, urban forest resources, groundwater and runoff pollution, air quality degradation, and noise incompatibility. (S)

Consistency with Comprehensive Plan Land Use Designations. As shown in Figure 2-2 in Section 2, Project Description, and as discussed in Table 3.2-1, the majority of the SUMC Site falls within a Major Institution/Special Facilities land use designation. However, small portions of the Main SUMC Site fall into the Research/Office Park land use designation. These portions include the 701 Welch Road and 703 Welch Road clinics near the intersection of Welch Road and Quarry Road, and the property immediately west of 800 Welch Road between Sand Hill Road and Welch Road. The 0.75-acre area on the western boundary of the SUMC Site falls within the jurisdiction of unincorporated Santa Clara County and is designated for Major Institution/University Lands/Campus Educational Facilities uses.

The SUMC Project would expand the LPCH Hospital into the area occupied by the 701 and 703 Welch Road clinics, which would be demolished. This expansion would conflict with the existing Research/Office Park designation, which does not allow hospital uses. However, as part of the SUMC Project, modifications to the existing Comprehensive Plan land use designations are proposed. The following changes to existing land use designations would be made through a Comprehensive Plan Amendment:

- SoM proposes annexation of the 0.75-acre parcel within Santa Clara County jurisdiction. This area would be annexed under the Major Institution/Special Facilities land use designation. The proposed FIM 1 building would be consistent with this designation.

- LPCH proposes that the 701 and 703 Welch Road parcels be converted from the Research/Office Park land use designation to the Major Institution/Special Facilities land use designation. The proposed LPCH expansion would be consistent with this new designation.

Proposed designations are shown in Figure 2-8 in the Project Description.

Following adoption of the proposed Comprehensive Plan Amendment, the SUMC Project would be consistent with all Comprehensive Plan land use designations. Thus, a less-than-significant impact would result with respect to Comprehensive Plan land use designations.

Consistency with Comprehensive Plan Policies and Programs. The SUMC Project is required to be consistent with the Comprehensive Plan. In order to ensure such consistency is achieved, City staff have identified all Comprehensive Plan policies applicable to the SUMC Project. Table 3.2-2 demonstrates how the SUMC Project would be consistent with each of these policies with mitigation. This analysis is based upon the Project Description and upon the environmental analysis provided in subsequent sections of this EIR. Where the environmental analysis identifies necessary mitigation measures, the analysis in Table 3.2-2 briefly describes those measures. Mitigation measures would help ensure consistency with Comprehensive Plan policies that avoid or reduce impacts related to visual quality, cultural resources, pedestrian circulation, urban forest resources, groundwater and runoff pollution, air quality degradation, and noise incompatibility.

It should be noted that the ultimate determinations of Comprehensive Plan consistency can and will be made by the City Council in acting on the SUMC Project, and that such ultimate findings of Comprehensive Plan consistency do not require that a project be entirely consistent with each individual Comprehensive Plan policy.

Text modifications to the Comprehensive Plan are also proposed to clarify proposed building height exceptions and commercial square footage limits for the SUMC to accommodate the proposed building heights. Specifically, the SUMC Project sponsors propose to modify Program L-3 as follows (underlined text would be added):

> The Citywide 50-foot height limit has been respected in all new residential and commercial development since it was adopted in the 1970's. Only a few exceptions have been granted for architectural enhancements or seismic retrofits to noncomplying buildings. In addition, the City has allowed taller buildings within the Hospital District at the Stanford University Medical Center that reflect the Medical Center's unique needs.

Table 3.2-2
Comparison of SUMC Project to Comprehensive Plan Policies

Comprehensive Plan Policy	SUMC Project Consistency
Goal L-1: A well-designed, compact city, providing residents and visitors with attractive neighborhoods, work places, shopping districts, public facilities, and open spaces.	
Policy L-1: Continue current City policy limiting future urban development to currently developed lands within the urban service area. The boundary of the urban service area is otherwise known as the urban growth boundary.	The City would annex an approximately 0.75-acre parcel from unincorporated Santa Clara County under the SUMC Project to accommodate the proposed FIM 1 building. As part of the main Stanford University campus, this site contains landscaping and is surrounded by urban uses. This parcel is outside the existing service and political jurisdiction of the City of Palo Alto; however, annexation of the parcel would not conflict with Policy L-1 because the annexation area is small, and environmental consequences from this annexation would be minimal. The SUMC Project would not impact the undeveloped lands that this policy seeks to protect.
Policy L-2: Maintain an active, cooperative working relationship with Santa Clara County and Stanford University regarding land use issues.	The SUMC Project is an urban infill project that would redevelop existing sites within the City with similar, but expanded uses. While the SUMC Sites border Santa Clara County, the adjacent uses are within Stanford University, which is one of the SUMC Project sponsors. No land use conflicts are thus anticipated between the SUMC Sites and adjacent County land.
Policy L-3: Guide development to respect views of the foothills and East Bay hills from public streets in the developed portions of the City.	As explained further in Section 3.3, Visual Quality, and as required in Mitigation Measure VQ-2.1, the SUMC Project would be subject to the City's Architectural Review process. The Architectural Review of the SUMC Project by the City's Architectural Review Board (ARB) would consider, among other factors, whether the SUMC Project has a coherent composition, and whether its bulk and mass are harmonious with surrounding development. The ARB's recommendations regarding these factors will be forwarded to the City Council for consideration. The City Council cannot approve the Architectural Review unless it finds that, among other things, natural features are appropriately preserved and integrated with the SUMC Project; the design promotes harmonious transitions in scale and character in areas between different designated land uses; and the planning and siting of the various functions and buildings on the site create an internal sense of order and provide a desirable environment for occupants, visitors, and the general community. Implementation of Mitigation Measure VQ-2.1 would require that the City and SUMC Project sponsors comply with Policy L-3 requirements for respecting views of the hillsides.

Table 3.2-2
Comparison of SUMC Project to Comprehensive Plan Policies

Policy L-5: Maintain the scale and character of the City. Avoid land uses that are overwhelming and unacceptable due to their size and scale.	As discussed in Section 3.3, and as required in Mitigation Measure VQ-2.1, Architectural Review would consider, among other factors, whether the SUMC Project has a coherent composition and whether its bulk and mass are harmonious with surrounding development. The City Council cannot approve the Architectural Review unless it finds that, among other things, the design promotes harmonious transitions in scale and character in areas between different designated land uses; the planning and siting of the various functions and buildings on the site create an internal sense of order and provide a desirable environment for occupants, visitors, and the general community; and the amount and arrangement of open space are appropriate to the design and the function of the structures.
Policy L-6: Where possible, avoid abrupt changes in scale and density between residential and non-residential areas and between residential areas of different densities.	As discussed in Section 3.3, and as required in Mitigation Measure VQ-2.1, the Architectural Review would consider, among other factors, whether the SUMC Project has a coherent composition and whether its bulk and mass are harmonious with surrounding development. The City Council cannot approve the Architectural Review unless it finds that, among other things, the design promotes harmonious transitions in scale and character in areas between different designated land uses; the planning and siting of the various functions and buildings on the site create an internal sense of order and provide a desirable environment for occupants, visitors, and the general community; and the amount and arrangement of open space are appropriate to the design and the function of the structures.
Policy L-7: Evaluate changes in land use in the context of regional needs, overall City welfare and objectives, as well as the desires of the surrounding neighborhoods.	This EIR provides an evaluation of local as well as regional environmental effects of the SUMC Project. It should be noted that the SUMC Project would maintain but expand existing on-site land uses. Consideration of the merits of the SUMC Project in context of regional needs, City welfare, and the desires of surrounding neighborhoods will be considered by the City during the subsequent project approval process.
Policy L-8: Maintain a limit of 3,257,900 square feet of new non-residential development for the nine planning areas evaluated in the 1989 Citywide Land Use and Transportation Study, with the understanding that the City Council may make modifications for specific properties that allow modest additional growth. Such additional growth will count towards the 3,257,900 maximum.	The City has determined that the medical center uses associated with the SUMC Sites should not be included in the non-residential development cap established by Policy L-8. The City is proposing a Comprehensive Plan Amendment (CPA), revising the language of Policy L-8 to clarify the exemption of hospital, clinic, and research buildings from square footage caps.

Table 3.2-2
Comparison of SUMC Project to Comprehensive Plan Policies

Goal L-2: An enhanced sense of "community" with development designed to foster public life and meet citywide needs.	
Policy L-10: Maintain a citywide structure of Residential Neighborhoods, Centers, and Employment Districts. Integrate these areas with the City's and the region's transit and street system.	The SUMC is a designated Employment District,[5] accessible via the existing street network. The SUMC Project would enhance integration of this Employment District into the citywide land use and circulation network by adding pedestrian and bicycle improvements and providing better connections between the SUMC Sites, the Stanford Shopping Center, PAITS, and the downtown area.
Policy L-11: Promote increased compatibility, interdependence, and support between commercial and mixed use centers and the surrounding residential neighborhoods.	The SUMC Project would meet the growing demand for medical facilities in Palo Alto and the region as indicated in the SUMC Project application. The medical services that the SUMC Project would provide to residents of the City of Palo Alto would increase interdependence and support between uses on the SUMC Sites and residential uses.
Goal L-5: High quality employment districts, each with their own distinctive character and each contributing to the character of the City as a whole.	
Policy L-42: Encourage Employment Districts to develop in a way that encourages transit, pedestrian and bicycle travel and reduces the number of auto trips for daily errands.	Bicycle and pedestrian improvements are included in the SUMC Project. A shuttle service would run between the SUMC Site, nearby commercial areas, and nearby transit hubs. The SUMC Project would also include the existing Transportation Demand Management (TDM) program, which includes efforts to increase use of transit and alternative modes of transportation, and decrease trips in single occupant vehicles.
Policy L-43: Provide sidewalks, pedestrian paths, and connections to the citywide bikeway system within Employment Districts. Pursue opportunities to build sidewalks and paths in renovation and expansion projects.	Several bicycle and pedestrian improvements, which would connect to the existing trail network, are included in the SUMC Project. The SUMC Project would also include bicycle and pedestrian improvements which would provide better connections between the SUMC Sites, the Stanford Shopping Center, PAITS, and the downtown area.

[5] City of Palo Alto, Comprehensive Plan, Land Use Element, 1998. Definition of "Employment Districts" is provided on page L-14. Employment Districts are geographic areas within the City with distinctive physical and economic characteristics. The Stanford Medical Center is one of four designated Employment Districts. Comprehensive Plan page L-33.

Table 3.2-2
Comparison of SUMC Project to Comprehensive Plan Policies

Policy L-45: Develop Stanford Medical Center in a manner that recognizes the citywide goal of compact, pedestrian-oriented development as well as the functional needs of the Medical Center.	The Main SUMC Site is a medical campus and by function is pedestrian-oriented, providing walkways, manicured lawns, benches, fountains, art sculptures, and pathway lighting. The proposed site plan is expected to maintain its pedestrian orientation. Functional adjacencies are critical to efficient medical services and, as such, the proposed site plan would provide optimal functional adjacencies. (A SUMC Project objective is to optimize department adjacencies to ensure the healthcare facilities are clinically safe environments, promote safe and efficient patient flow, and provide access to state-of-the-art technology.)
Policy L-48: Promote high quality, creative design and site planning that is compatible with surrounding development and public spaces.	As discussed in Section 3.3, and as required in Mitigation Measure VQ-2.1, the Architectural Review of the SUMC Project by the ARB would consider, among other factors, whether the SUMC Project incorporates quality materials, harmonious colors, appropriate ancillary features, and a cohesive design with a coherent composition. The City Council cannot approve the Architectural Review unless it finds that, among other factors, the design is compatible with the immediate environment of the SUMC Sites, is appropriate to the function of the SUMC Project, promotes harmonious transitions in character in areas between different designated land uses, and is compatible with approved improvements both on and off the site. Implementation of Mitigation Measure VQ-2.1 would ensure that the proposed structures would be compatible with surrounding development.
Policy L-49: Design buildings to revitalize streets and public spaces and to enhance a sense of community and personal safety. Provide an ordered variety of entries, porches, windows, bays and balconies along public ways where it is consistent with neighborhood character; avoid blank or solid walls at street level; and include human-scale details and massing.	As discussed in Section 3.3, the SUMC draft Design Guidelines outline three basic factors to be applied to the SUMC Project: site design, building design, and connective elements. The site design concept for the SUMC Project builds upon existing patterns of pedestrian and vehicular circulation, and parking. In addition, open spaces would serve to physically connect the SUMC to the public perimeter, as well as to connect the SUMC visually to the current Stanford landscape. The proposed building designs would serve to redefine the architectural image and spatial character of the medical campus, while blending with the existing buildings and landscape. The intent of the Design Guidelines is to allow a variety of architectural expressions for each institution, while promoting a cohesive campus image. In addition, connective elements include consistent use of specific paving materials; the placement of new planting schemes; lighting; signage; shared amenities (for example, bus shelters, benches, and public art); and utilities and infrastructure.

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Policy L-50: Encourage high quality signage that is attractive, appropriate for the location and balances visibility needs with aesthetic needs.	As discussed in Section 3.3, and as required in Mitigation Measure VQ-2.1, the Architectural Review of the SUMC Project by the ARB would consider, among other factors, whether the SUMC Project incorporates quality materials, harmonious colors, appropriate ancillary features, and a cohesive design with a coherent composition. The City Council cannot approve the Architectural Review unless it finds that, among other factors, the design is compatible with the immediate environment of the SUMC Sites, is appropriate to the function of the SUMC Project, promotes harmonious transitions in character in areas between different designated land uses, and is compatible with approved improvements both on and off the site. Implementation of Mitigation Measure VQ-2.1 would ensure that the proposed structures would be compatible with surrounding development. In addition, the SUMC draft Design Guidelines state that the SUMC Project would establish a unifying signage theme and follow existing campus signage guidelines for directional and pedestrian signs.
Goal L-7: Conservation and preservation of Palo Alto's historic buildings, sites, and districts.	
Policy L-51: Encourage public and private upkeep and preservation of resources that have historic merit, including residences listed in the Historic Inventory.	Policy L-51 encourages the preservation of historic structures. The City has identified Mitigation Measures CR-1.1, CR-1.2, CR-1.3, and CR-1.4 to help minimize the loss resulting from the demolition of the historic Edward Durell Stone Building complex (see Section 3.8, Cultural Resources). Therefore, the SUMC Project would not conflict with this policy since it *encourages* protection of historic resources. The SUMC Project also includes the renovation of Hoover Pavilion, which is a historic resource (see Section 3.8 Cultural Resources). Structures proposed at the Hoover Pavilion Site would be sited so as to preserve the visual prominence of the Hoover Pavilion as a historic structure. In addition, Mitigation Measure CR-1.5 would protect the Hoover Pavilion from vibration impacts during construction. The preservation and enhancement of this historic resource furthers the objectives of Policy L-51.

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Comparison of SUMC Project to Comprehensive Plan Policies

Policy L-54: Support the goals and objectives of the Statewide Comprehensive Historic Preservation Plan for California.	The Statewide Comprehensive Historic Preservation Plan identifies current and emerging historic preservation issues throughout the State and establishes the vision, mission, and priorities for the Office of Historic Preservation (OHP). The OHP is required to review and revise the State Plan every five years as a condition for receiving a grant from the federal Historic Preservation Fund. The SUMC Project would not conflict with the OHP's preparation or review of the State Plan, including the identification of statewide preservation issues or the establishment of the OHP's vision, mission, and priorities.
Policy L-58: Promote adaptive reuse of old buildings.	The SUMC Project would renovate the Hoover Pavilion and would improve seismic operating conditions of clinic uses within. Such renovation would constitute adaptive reuse.
Goal L-9: Attractive, inviting public spaces and streets that enhance the image and character of the City.	
Policy L-70: Enhance the appearance of streets and other public spaces by expanding and maintaining Palo Alto's street tree system.	Street trees would be incorporated into the SUMC Sites under the SUMC Project.
Policy L-75: Minimize the negative physical impacts of parking lots. Locate parking behind buildings or underground wherever possible.	The SUMC Project would add new underground parking structures and an above-ground parking structure at the Hoover Pavilion Site. The parking structure at the Hoover Pavilion Site would be located south of Hoover Pavilion to preserve views of this landmark from public vantage points.
Policy L-76: Require trees and other landscaping within parking lots.	The SUMC Project would add above- and underground parking structures to minimize the area devoted to surface parking lots; therefore, landscaping would be minimal. However, as discussed in Section 3.3, and as required under Mitigation Measure VQ-2.1, the Architectural Review of the SUMC Project by the ARB would consider, among other factors, whether the SUMC Project adequately incorporates landscaping. Upon receipt of the ARB's recommendations, the City Council cannot approve the Architectural Review unless it finds that, among other factors, the amount and arrangement of open space are appropriate to the design and the function of the structures, and the planning and siting of the various functions and buildings provide a desirable environment for occupants, visitors, and the general community.

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Policy L-77: Encourage alternatives to surface parking lots to minimize the amount of land that must be devoted to parking, provided that economic and traffic safety goals can still be achieved.	The SUMC Project would add above- and underground parking structures to minimize the area devoted to surface parking. In addition, the proposed number of spaces would be sufficient to accommodate the resulting demand (see Section 3.4, Transportation). Lastly, a TDM Program would be continued to decrease car trips and parking demand (see description in Chapter 2, Project Description).
Policy L-78: Encourage development that creatively integrates parking into the project by providing for shared use of parking areas.	Parking on the SUMC Site would be shared by the various on-site uses. Sharing parking facilities with off-site uses would be infeasible due to the distance to off-site facilities.
Goal T-1: Less reliance on single-occupant vehicles.	
Policy T-1: Make land use decisions that encourage walking, bicycling, and public transit use.	The SUMC Project would involve infill within an area that is currently accessible by transit, walking, and bicycling. By reducing the size of surface parking lots and increasing development density, the SUMC Project would be expected to increase demand for alternative means of transport. The Hospitals and SoM both implement TDM Programs that encourage walking, bicycling, and public transit use. These programs would continue to decrease car trips and parking demand (see description in Chapter 2, Project Description). On-site and off-site bicycle and pedestrian improvements included in the SUMC Project would provide better connections between the SUMC Sites, the Stanford Shopping Center, PAITS, and the downtown area.
Policy T-3: Support the development and expansion of comprehensive, effective programs to reduce auto use at both local and regional levels.	The SUMC Project sponsors implement (and would continue to implement) a TDM Program to decrease car trips and parking demand. See also Policy T-1.
Goal T-2: A convenient, efficient, public transit system that provides a viable alternative to driving.	
Policy T-5: Support continued development and improvement of the University Avenue and California Avenue Transit Stations, and the San Antonio Road Station as important transportation nodes for the City.	The SUMC Project would continue to implement the Marguerite Shuttle, which serves the SUMC Sites and the University Avenue Transit Station. In addition, the SUMC Project would involve bicycle and pedestrian circulation improvements (to be refined during Architectural Review) that would provide access to the transit station.

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Policy T-6: Improve public transit access to regional destinations, including those within Palo Alto.	The SUMC Project would not impede the City's plans to develop regional public transit. Moreover, the SUMC Project sponsors would continue to implement a TDM Program to decrease car trips and parking demand. These programs include provision of the free Marguerite Shuttle service, which connects the SUMC Sites to other destinations, local transit and Caltrain, and free use of the East Bay express bus that connects BART and ACE train to Stanford.
Policy T-8: Encourage employers to develop shuttle services connecting employment areas with the multi-modal transit stations and business districts.	The SUMC Project would continue the use of the Marguerite Shuttle, a free local shuttle serving the SUMC Sites, PAITS, the Shopping Center Site, and other nearby locations.
Goal T-3: Facilities, services, and programs that encourage and promote walking and bicycling	
Policy T-14: Improve pedestrian and bicycle access to and between local destinations, including public facilities, schools, parks, open space, employment districts, shopping centers, and multi-modal transit stations.	See discussion for Policy L-42.
Policy T-15: Encourage the acquisition of easements for bicycle and pedestrian paths through new private developments.	Several bike and pedestrian trails, which would connect to the existing trail network, are included in the SUMC Project.
Policy T-19: Improve and add attractive, secure bicycle parking at both public and private facilities, including multi-modal transit stations, on transit vehicles, in City parks, in private developments, and at other community destinations.	Bicycle parking would be provided at the SUMC Sites under the SUMC Project.
Policy T-22: Improve amenities such as seating, lighting, bicycle, parking, street trees, and interpretive stations along bicycle and pedestrian paths and in City parks to encourage walking and cycling and enhance the feeling of safety.	The SUMC Project would install new benches, lighting, bicycle, parking, landscaping along its pedestrian paths on site.
Policy T-23: Encourage pedestrian-friendly design features such as sidewalks, street trees, on-street parking, public spaces, gardens, outdoor furniture, art, and interesting architectural details.	See discussion for Policy T-22.
Goal T-4: An efficient roadway network for all users.	
Policy T-25: When constructing or modifying roadways, plan for usage of the roadway space by all users, including motor vehicles, transit vehicles, bicyclists, and pedestrians.	The proposed widening of Welch Road and expansion of Durand Way would accommodate bicycles, pedestrians, and transit.

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Policy T-26: Participate in the design and implementation of comprehensive solutions to traffic problems near Stanford Shopping Center and Stanford Medical Center.	Section 2, Project Description, identifies that the SUMC Project would implement traffic management solutions, such as a continued TDM Program, bicycle and pedestrian improvements, and public transit access.
Policy T-27: Avoid major increases in street capacity unless necessary to remedy severe traffic congestion or critical neighborhood traffic problems. Where capacity is increased, balance the needs of motor vehicles with those of pedestrians and bicyclists.	The SUMC Project would add a connection (Durand Way) between Sand Hill Road and Welch Road; however, this connection would provide new access to the Main SUMC Site. In addition, Welch Road would be widened to three lanes to provide roadway capacity. Neither of these improvements would enhance capacity for anticipated vehicle movement, including ambulance access.
Policy T-28: Make effective use of the traffic-carrying ability of Palo Alto's major street network without compromising the needs of pedestrians and bicyclists also using this network.	Mitigation Measure TR-6.1 in Section 3.4, Transportation, requires the SUMC Project sponsors to implement improvements for bicycle and pedestrian safety and access at intersections affected by SUMC Project traffic.
Policy T-30: Reduce the impacts of through-traffic on residential areas by designating certain streets as residential arterials.	As discussed under Impact TR-3 in Section 3.4, Transportation, the SUMC Project would not result in adverse impacts to Palo Alto residential roadway segments. It should be noted that the SUMC Project would have significant impacts on residential roadways outside Palo Alto in Menlo Park. Identified mitigation would reduce the impact to less than significant (see Section 3.4, Transportation).
Policy T-34: Implement traffic calming measures to slow traffic on local and collector residential streets and prioritize these measures over congestion management. Include traffic circles and other traffic calming devices among these measures.	The SUMC Project would not significantly impact adversely affect traffic on residential streets within Palo Alto, and therefore does not include traffic calming measures. See Policy T-30.
Policy T-39: To the extent allowed by law, continue to make safety the first priority of citywide transportation planning. Prioritize pedestrian, bicycle, and automobile safety over vehicle level-of-service at intersections.	See discussion for Policy T-28. In its consideration of the SUMC Project, the City will continue to adhere to this Policy and will prioritize safety over vehicle level-of-service improvements at intersections.
Goal T-7: Mobility for people with special needs.	
Policy T-42: Address the needs of people with disabilities and comply with the requirements of the Americans with Disabilities Act (ADA) during the planning and implementation of transportation and parking improvement projects.	The SUMC Project would be required to conform to ADA standards specified in the Palo Alto Municipal Code.

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Goal T-8: Attractive, convenient public and private parking facilities.	
Policy T-48: Encourage parking strategies in the Stanford Medical Center area that maximize the efficient use of parking and, in the long term, consider the possible use of remote parking lots with shuttle bus service.	Parking would be provided under the SUMC Project for the calculated increased demand, which takes into account minimization of parking needs through implementation of a comprehensive TDM program. Existing TDM programs, such as operation of the Marguerite Shuttle, would be continued in order to minimize the need for additional parking. This program also includes provision of free use of the Line U Stanford Express, which connects Stanford to BART and the ACE train. The Line U express bus enables employees to park remotely, and travel to the SUMC via this service. In addition, the proposed parking structure at the Hoover Pavilion Site would be used by SUMC staff, who would take a shuttle to the Main SUMC site.
Goal N-1: A citywide open space system that protects and conserves Palo Alto's natural resources and provides a source of beauty and enjoyment for Palo Alto residents.	
Policy N-3: Protect sensitive plant species resources from the impacts of development.	Per Section 3.9, Biological Resources, there is no habitat capable of supporting sensitive plant species at the SUMC Sites, and there would be no impacts on sensitive plant species.
Policy N-6: Through implementation of the Site and Design process and the Open Space zone district regulations, minimize impacts of any new development on views of the hillsides, on the open space character, and the natural ecology of the hillsides.	As explained further in Section 3.3, and as required under Mitigation Measure VQ-2.1, the SUMC Project is subject to the City's Architectural Review process. The Architectural Review of the SUMC Project by the City's ARB would consider, among other factors, whether the SUMC Project has a coherent composition, and whether its bulk and mass are harmonious with surrounding development. The ARB's recommendations regarding these factors will be forwarded to the City Council for consideration. The City Council cannot approve the Architectural Review unless it finds that, among other things, natural features are appropriately preserved and integrated with the SUMC Project; the design promotes harmonious transitions in scale and character in areas between different designated land uses; and the planning and siting of the various functions and buildings on the site create an internal sense of order and provide a desirable environment for occupants, visitors and the general community.

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Goal N-2: Conservation of creeks and riparian areas as open space amenities, natural habitat areas, and elements of community design.	
Policy N-11: Preserve the integrity of riparian corridors.	Construction associated with the SUMC Project could contribute to bed and bank erosion along the San Francisquito Creek riparian corridor. However, as discussed in Section 3.11, Hydrology, the SUMC Project would be required to comply existing regulatory requirements (Municipal Regional Permit, Construction General Permit, as well as local municipal codes), which include both construction phase and permanent erosion and sediment controls that prevent substantial erosion and sediment transport from development within the San Francisquito Creek watershed. Construction site inspection by the City, as required by the UWMP, would also ensure that appropriate erosion and sediment control BMPs are implemented and functioning.
Policy N-13: Discourage creek bank instability, erosion, downstream sedimentation, and flooding by minimizing site disturbance and vegetation removal on or near creeks and carefully reviewing grading and drainage plans for development near creeks and elsewhere in the watersheds of creeks.	See discussion for Policy N-11.
Goal N-3: A thriving "urban forest" that provides ecological, economic, and aesthetic benefits for Palo Alto.	
Policy N-14: Protect, revitalize, and expand Palo Alto's urban forest through public education, sensitive regulation, and a long-term financial commitment that is adequate to protect this resource.	The SUMC Project would replace trees removed during construction and would supply new street trees. However, the SUMC Project would remove up to 71 Protected Trees, which are considered an important resource to the City. Mitigation Measures BR-4.1 through BR-4.5, provided in Section 3.9, Biological Resources, require the preparation of a Tree Preservation Report, a solar access study, a Tree Relocation Feasibility Plan, a Tree Preservation Bond/Security Guarantee, and minor site modifications to the current site plans. While complete preservation of Protected Trees would not occur, this mitigation would fulfill the City's responsibility to protect, revitalize, and expand Palo Alto's urban forest. Also, as required under Mitigation Measure VQ-2.1, the Architectural Review of the SUMC Project by the ARB would consider, among other factors, whether the SUMC Project adequately incorporates landscaping. Upon receipt of the ARB's recommendations, the City Council cannot approve the Architectural Review unless it finds that, among other factors, the amount and arrangement of open space are appropriate to the design and the function of the structures, and the

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	planning and siting of the various functions and buildings provide a desirable environment for occupants, visitors, and the general community. In addition, the SUMC draft Design Guidelines include landscaping elements in order to create visual continuity in open spaces between the SUMC Sites and the Stanford campus. The campus would include approved tree species and their typical planting patterns to serve campus cohesiveness. The SUMC Sites would include landscaping such as: the naturalistic Arboretum with native oak trees; formal open space to create nodes of interest and connectors; lawns with manicured grass; interior courtyards and gardens; and street tress that would line the streets and major pathways.
Goal N-4: Water resources that are prudently managed to sustain plant and animal life, support urban activities, and protect public health and safety.	
Policy N-18: Protect Palo Alto's groundwater from the adverse impacts of urban uses.	During construction, impervious surfaces (e.g., parking lots and buildings) would be removed and pervious surfaces exposed to rainfall and runoff waters. Without controls, infiltrating rainfall could pick up existing pollutants in the underlying soils or pollutants associated with construction activities (e.g., spills and leaks) and carry these materials to the local groundwater table. Mitigation Measure HW-3.1, provided in Section 3.11, Hydrology, requires the SUMC Project sponsors to develop a work plan for any unknown contaminated sites. This measure would address environmental impacts associated with groundwater quality impacts.
Policy N-19: Secure a reliable, long-term supply of water for Palo Alto.	A Water Supply Assessment (WSA) was prepared for the SUMC Project to determine whether or not the City would have sufficient supply to meet projected demand. The WSA found that in years of average and above-average water supply, the City has adequate supplies to serve 100 percent of normal-year demands, inclusive of the SUMC Project, and that in dry-year and multiple-dry-year events, when SFPUC imposes reductions in its normal supply to the City, the City has in place a Water Shortage Contingency Plan sufficient to maintain a balance of supplies and demands. See Section 3.15, Utilities.
Policy N-20: Maximize the conservation and efficient use of water in new and existing residences, businesses and industries.	The SUMC Project would be required to conform to landscaping water conservation practices specified in the Municipal Code (see policy summary in Section 3.15, Utilities). Moreover, the SHC and LPCH have committed to several water conservation measures including daily and seasonal adjustment of irrigation, drought tolerant landscaping, and water and moisture-retaining

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	mulches.[6] The SUMC Project also proposes to apply water efficient fixtures, sterilizers, and kitchen equipment, and would continue its current use of microfiber mops for cleaning.[7]
Policy N-21: Reduce non-point source pollution in urban runoff from residential, commercial, industrial, municipal, and transportation land uses and activities.	As discussed in Section 3.11, Hydrology, operation and construction of the SUMC Project could cause or contribute to stormwater runoff if disturbed surfaces are not stabilized and if changes in drainage patterns result in more runoff. However, compliance with existing mandatory regulations and implementation of these requirements would prevent substantial runoff by requiring erosion and sediment controls. In addition, Mitigation Measure HW-3.1, provided in Section 3.10, Hydrology, requires the SUMC Project sponsors develop a work plan for any unknown contaminated sites. This measure, along with the existing regulations, would address environmental impacts associated with groundwater and surface water quality impacts.
Policy N-22: Limit the amount of impervious surface in new development or public improvement projects to reduce urban runoff into storm drains, creeks, and San Francisco Bay.	As discussed in Section 3.11, Hydrology, the SUMC Project, at full buildout, would decrease stormwater runoff by increasing the pervious area on the site, including roof area that contains plant material.[8]
Policy N-23: Reduce the discharge of toxic materials into the City's sanitary sewer collection system by promoting the use of Best Management Practices.	Demolition of the existing structures on the SUMC Sites would disturb hazardous building materials such as asbestos, PCBs, lead, and mercury. In addition, hazardous materials, such as paints, solvents, cements, glues and fuels, would also be used in varying amounts during construction. Operation of the SUMC Project would also increase the use and amount of hazardous materials on the SUMC Sites. Examples of hazardous materials include chemical waste, medical waste, and radioactive waste. The SUMC Project sponsors would be required to comply with existing federal, State, and local laws and regulations to protect the community and the environment from exposure to hazardous materials, including the discharge of toxic materials into the City's sanitary sewer collection system.

6 William T. Phillips, Stanford University, Memorandum to Steven Turner, City of Palo Alto: *Response to City Palo Alto's Draft Water Supply Assessment for the Stanford University Medical Center Facilities Renewal and Replacement Project*, August 2008.

7 Catherine Palter, memorandum to EIR Team (City of Palo Alto and PBS&J), November 12, 2008.

8 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 4, Figures 4-8a and 4-8b.

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Policy N-24: Improve storm drainage performance by constructing new system improvements where necessary and replacing undersized or otherwise inadequate lines with larger lines or parallel lines.	As discussed in Section 3.14, Utilities, the SUMC Project would not require expansion of existing stormwater infrastructure.
Goal N-5: Clean, healthful air for Palo Alto and the San Francisco Bay Area.	
Policy N-26: Support regional, State, and federal programs that improve air quality in the Bay Area.	As discussed in Section 3.5, Air Quality, construction and operation of the SUMC Project would exceed BAAQMD standards for criteria pollutants. Policy N-26 does not prohibit such an exceedance. The SUMC Project includes continued implementation of the SUMC Project sponsors' TDM program. Mitigation Measures AQ-1.1 and AQ-1.2, provided in Section 3.5, Air Quality, would address environmental impacts associated with particulate emissions by controlling construction dust and reducing diesel emissions. By requiring these mitigations, the City would support applicable air quality programs.
Policy N-27: Reduce emission of particulates from wood burning stoves, construction activity, automobiles, and other sources.	As discussed in Section 3.5, Air Quality, heavy construction activity on dry soil exposed during construction phases would cause emissions of dust (usually monitored as PM_{10}), which could be annoying to persons near the construction area or otherwise unhealthy. The SUMC Project would implement existing TDM programs, which would minimize mobile source emissions during operation of the SUMC Project. Nevertheless, those emissions would exceed the Bay Area Air Quality Management District's (BAAQMD) significance threshold of 80 pounds per day or 15 tons per year of PM_{10}. Emissions would result in a substantial contribution to an existing regional particulate air quality problem. Mitigation Measures AQ-1.1 and AQ-1.2, provided in Section 3.5, Air Quality, would address environmental impacts associated with particulate emissions by controlling construction dust and controlling diesel emissions. These mitigation measures would reduce emissions of particulates from construction and continued implementation of the ongoing TDM programs would minimize emissions from operation of the SUMC Project.
Policy N-28: Encourage developers of new projects in Palo Alto, including City projects, to provide improvements that reduce the necessity of driving alone.	See Policies L-42, L-43, and N-27.

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Policy N-29: All potential sources of odor and/or toxic air contaminants should be adequately buffered, or mechanically or otherwise mitigated to avoid odor and toxic impacts that violate relevant human health standards.	As discussed in Section 3.5, Air Quality, the SUMC Project would include on-site stationary source emissions related to the periodic testing of emergency diesel generators. These emissions are not expected to have the potential for substantial odor impacts on local sensitive receptors, resulting in less-than-significant impacts. In addition, the health risk assessment prepared for the SUMC Project indicates that the estimated excess lifetime cancer risks associated with potential simultaneous exposures to construction diesel particulate matter (DPM) and operational sources of toxic air contaminants (TACs) would be below the BAAQMD significance threshold of 10 in one million, and the estimated health indexes (HIs) would be below 1.
Goal N-6: An environment free of the damaging effects of biological and chemical hazardous materials.	
Policy N-30: Minimize the use of toxic and hazardous materials. Encourage the use of alternative materials and practices that are environmentally benign.	As discussed in Section 3.11, Hazardous Materials, the SUMC Project would be required to conform to all Municipal Code, State and federal policies regarding the use of hazardous materials. Development proposed under the SUMC Project would comply with existing hazardous materials management plans.
Goal N-7: Reduced volumes of solid waste; solid waste disposed in an environmentally safe, efficient, manner.	
Policy N-34: Reduce the amount of solid waste disposed in the City's landfill by reducing the amount of waste generated and promoting the cost-effective reuse of materials that would otherwise be placed in a landfill.	As discussed in Section 3.14, Utilities, the SUMC Project would be subject to Palo Alto Municipal Code 5.24 *Requirement to Divert Construction and Demolition Waste from Landfill Ordinance*. In addition to complying with Stanford University's general waste reduction initiatives, which cover paper, cardboard, cans, glass, and plastics, compostable goods, batteries, and other items, the hospitals would implement a number of specialized recycling programs for items such as electronic wastes, fluorescent lamps, toner and inkjet cartridges, surplus chemicals, batteries, and waste anesthetics. Instrumentation and automation upgrades would also help to reduce the production of wastes. The SUMC Project would not generate wastes that would exceed the capacity of the solid waste facilities that serve the City, and would take measures to reduce, reuse, and recycle wastes.

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Policy N-35: Reduce solid waste generation through salvage and reuse of building materials, including architecturally and historically significant materials.	As discussed in Section 3.14, Utilities, construction of the SUMC Project would be subject to the Requirement to Divert Construction and Demolition Waste from Landfill Ordinance (Palo Alto Municipal Code 5.24). This ordinance requires that a minimum of 90 percent of inert solids (e.g., concrete, asphalt, and rock) and a minimum of 50 percent of the remaining debris, generated from construction and demolition projects, be diverted from landfills through reuse and/or recycling.
Policy N-37: Ensure the environmentally sound disposal of solid waste.	See Policies N-34 and N-35.
Goal N-8: An environment that minimizes the adverse impacts of noise.	
Policy N-39: Encourage the location of land uses in areas with compatible noise environments. Use the guidelines in the table "Land Use Compatibility for Community Noise Environment" to determine compatibility.	The SUMC Project would not introduce a new land use but would expand and reconfigure the established medical office and hospital land uses at the SUMC Sites. This analysis looks at the relationship of the SUMC Sites with surrounding uses. As discussed in Section 3.7, Noise, the mechanical noise generated by the SHC emergency generators off Welch Road could have a significant impact on nearby residential uses. However, Mitigation Measure NO-4.1 requires shielding or enclosure of equipment, which would reduce noise to less-than-significant levels. The SUMC Project would emit significant and unavoidable ambulance noise on residential uses off a portion of Sand Hill Road. However, ambulance noise is not considered to be incompatible in residential or other developed areas. It also should be noted that the SUMC Project would not create a new land use on the Main SUMC Site. Also, ambulance noise is already generated by the SHC Hospital, and the impact in this case would be along a portion of Sand Hill Road where there would be a new ambulance route. Policy N-39 does not prohibit location of land uses with incompatible noise sources; rather it calls for encouraging location of land uses in areas with compatible noise environments. The ambulance noise would be sporadic within the existing environment.
Policy N-41: When a proposed project is subject to CEQA, the noise impact of the project on existing residential land uses should be evaluated in terms of the increase in existing noise levels and potential for adverse community impact, regardless of existing background noise levels. If an area is below the applicable maximum noise guideline, an increase in noise up to the maximum should not necessarily be allowed. A project should be considered to cause a significant degradation of the noise environment if it meets any of the following criteria:	Consistent with Policy N-41, this EIR identifies where significant noise impacts will occur. Section 3.7, Noise, provides an evaluation of the SUMC Project on residential uses. Among the significance criteria applied are the standards set forth in the Comprehensive Plan. Based on the City's Ldn criteria in the Comprehensive Plan, the SUMC Project would emit significant and unavoidable ambulance noise on residential uses off a portion of Sand Hill Road, on the basis that the ambulance noise would increase Ldn by more than 5.0 dB, as stated in

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• The project would cause the average 24-hour noise level (Ldn) to increase by 5.0 dB or more in an existing residential area, even if the Ldn would remain below 60 dB; • The project would cause the Ldn to increase by 3.0 dB or more in an existing residential area, thereby causing the Ldn in the area to exceed 60 dB; • The project would cause an increase of 3.0 dB or more in an existing residential area where the Ldn currently exceeds 60 dB.	Policy N-41. Existing Ldn along Sand Hill Road ranges from 53.5 to 55.2 dBA, which is below the 75 dB maximum noise guideline for conditionally acceptable uses, per the Comprehensive Plan's Land Use Compatibility chart. The ambulance noise would increase L_{dn} by about 8 dBA. At most, the resulting dBA would be about 63.2 dBA, which is still within the maximum noise guideline for conditionally acceptable uses per the Comprehensive Plan's Land Use Compatibility chart. As such, the City may approve the SUMC Project under Policy N-41.
Policy N-43: Protect the community and especially sensitive noise receptors, including schools, hospitals, and senior care facilities, from excessive noise.	Section 3.7, Noise, states that construction of the SUMC Project could result in a significant noise level with respect to on-site hospital uses. Mitigation Measure NO-1.1, identified in Section 3.7, Noise, involves best management practices for construction noise and would address environmental impacts associated with pile driving noise to off-site sensitive receptors and other construction noise impacts to on-site sensitive receptors. This mitigation measure would lessen the impacts from excessive construction-related noise. Also, the mechanical noise could have a significant impact on nearby residential uses. However, Mitigation Measure NO-4.1 requires shielding or enclosure of equipment, which would reduce noise to less-than-significant levels. The City has identified feasible measures to protect sensitive uses from excessive noise.
Goal N-9: A clean, efficient, competitively-priced energy supply that makes use of cost-effective renewable resources.	
Policy N-47: Optimize energy conservation and efficiency in new and existing residences, businesses, and industries in Palo Alto.	As discussed in Section 3.6, Climate Change, the SUMC Project includes a number of energy conservation strategies. The SHC and LPCH components of the SUMC Project would be designed to achieve EnergyStar scores of 90-95, which means they would perform better than 90-95 percent of similar hospitals. The buildings would use 35 percent less energy than typical hospitals (based on a comparison to DOE's Commercial Buildings Energy Consumption Survey) and 20 percent less energy than a hospital designed to meet ASHRAE 90.1 standards. The new SoM buildings would meet Stanford University's 2008 Building Performance Guidelines, which set a target energy efficiency in new buildings of 30 percent below California Title 24/ASHRAE 90.1 (2004).

Table 3.2-2
Comparison of SUMC Project to Comprehensive Plan Policies

Policy N-48: Encourage the appropriate use of alternative energy technologies.	The City provides electricity and natural gas to the SUMC Site and is currently replacing a significant portion of its energy supply with renewable energy resources. Although no on-site renewable energy technologies are planned, the SUMC Project would support alternative energy technologies through purchase of energy through the City.
Goal N-10: Protection of life and property from natural hazards, including earthquake, landslide, flooding, and fire.	
Policy N-51: Minimize exposure to geologic hazards, including slope stability, subsidence, and expansive soils, and to seismic hazards including groundshaking, fault rupture, liquefaction, and landsliding.	As discussed in Section 3.10, Geology, non-hospital structures would be required to comply with the California Building Code, while hospital structures would be required to comply with heightened OSHPD requirements, both of which would reduce exposures to geologic hazards to a less-than-significant level. The SUMC Project was initially triggered by SB 1953, which requires the all hospital facilities meet current seismic standards to prevent disruption of hospital operations during an earthquake.
Policy N-52: Minimize exposure to flood hazards by adequately reviewing proposed development in flood prone areas.	This EIR reviews potential flooding impacts at the SUMC Site in Section 3.11, Hydrology. Flooding impacts were determined to be less than significant.
Policy N-54: Provide emergency fire and medical services consistent with the response time standards set forth in the Fire Department's annual budget.	As discussed in Section 3.14, Public Services, the SUMC Project must construct its proposed structures to current OSHPD and City Code standards for fire safety and would install the latest fire control measures. As a part of the City's development review process, the State Fire Marshal would review the plans for the SUMC Project (including construction, fire service water main, and Automatic Fire Alarm System plans) to determine conformance with the Fire Code prior to issuance of a building permit.
Goal C-4: Attractive, well-maintained community facilities that serve Palo Alto residents.	
Policy C-26: Maintain and enhance existing park facilities.	There are no City park facilities on the SUMC Sites. Per Section 3.14, Public Services, the SUMC Project would have a less-than-significant impact on City parks.
Policy C-27: Seek opportunities to develop new parks and recreation facilities to meet the growing needs of residents and employees of Palo Alto.	As discussed in Section 3.14, Public Service, as required by Palo Alto Municipal Code 16.58, the SUMC Project would be required to pay a "Community Facility Fee," which has a line item for parks that would fund acquisition of land and improvements for neighborhood and district parks.

Table 3.2-2
Comparison of SUMC Project to Comprehensive Plan Policies

Goal C-5: Equal access to educational, recreational, and cultural services for all residents.	
Policy C-30: Facilitate access to parks and community facilities by a variety of transportation needs.	See Policies L-42, L-43, and L-45. The Marguerite Shuttle, one of the TDM measures discussed above, would provide access between the SUMC Sites and other community facilities.
Goal B-6: Thriving employment districts at Stanford Research Park, Stanford Medical Center, East Bayshore/San Antonio Road Area and Bayshore Corridor that complement the City's business and neighborhood centers.	
Policy B-32: Assist Stanford Medical Center in responding to changes in the delivery of health care services. Work with the Center to plan for changing facility needs, but within the context of City of Palo Alto planning goals and policies, as well as the goals and policies of other relevant jurisdictions.	The SUMC Project addresses changing demand for health care services and facilities. The City is working with the SUMC Project sponsors to determine the most appropriate plan for future development as part of the review of the SUMC Project application. This EIR has been prepared to inform the City's decisions with respect to applicable planning goals and policies.

Sources: Palo Alto Comprehensive Plan, 1998; PBS&J, 2010.

In addition, the City has proposed to modify Policy L-8 as follows (underlined text would be added):

> Maintain a limit of 3,257,000 square feet of new non-residential development for the nine planning areas evaluated in the 1989 Citywide Land Use and Transportation Study, with the understanding that the City Council may make modifications for specific properties that allow modest additional growth. Such additional growth will count towards the 3,257,900 maximum. Stanford University Medical Center hospital uses are not intended to be treated as "non-residential development" for the purposes of this policy; thus, additional growth in areas zoned "Hospital District" is exempt from this policy.

Consistency with the Palo Alto Zoning Ordinance. The SUMC Project would conflict with existing development restrictions in the PF district, such as FAR and height limits. The existing maximum FAR is 1.0, while the FAR proposed under the SUMC Project would be up to 1.5. Maximum heights proposed under the SUMC Project would be approximately 130 feet, which would exceed the existing maximum allowable height of 50 feet. To address this zoning inconsistency, as part of the SUMC Project, the SUMC Project sponsors propose creation of a new zoning district that could be applied by the City to land used specifically for hospitals and clinics, associated medical research, medical office, and support uses. The new zoning district would have its own name, such as "Hospital District," and would include development standards that accommodate the SUMC Project as proposed.

The proposed boundaries of the new district are depicted in Figure 2-8 in Section 2, Project Description. The proposed zoning changes would resolve potential zoning inconsistencies associated with the SUMC Project. With the adoption of the new Hospital District, the SUMC Project would be consistent with the Palo Alto Zoning Ordinance. The impacts from the zoning changes are addressed in various sections of this document. The most notable impacts from the proposed new zoning are from the increased height allowance.

MITIGATION MEASURES. The mitigation measures identified in Table 3.2-2 and in the rest of Section 3, Environmental Analysis, would ensure that the SUMC Project would have no conflicts with Comprehensive Plan policies adopted for the purposes of avoiding or mitigating environmental impacts. These measures include Mitigation Measure VQ-2.1, which requires compliance with the City's Architectural Review process and recommendations; CR-1.2 through 1.4, which involve measures to minimize the loss of the historic Edward Durell Stone Building complex; CR-1.1 and CR-1.5, which involve measures to minimize vibration impacts on the Hoover Pavilion; TR-6.1, which requires improvements for bicycle and pedestrian safety and access at intersections affected by SUMC Project traffic; BR-4.1 through BR-4.5, which require the preparation of a Tree Preservation Report, a solar access study, a Tree Relocation Feasibility Plan, a Tree Preservation Bond/Security Guarantee, and minor site modifications to the current site plans; HW-3.1, which requires a work plan to protect groundwater from contamination; AQ-1.1 through AQ-1.2, which would control construction dust and reduce diesel emissions; NO-4.1, which requires noise shielding or enclosure of equipment; and NO-1.1, which controls construction noise. (LTS)

LU-2. Conflicts with Established Residential, Recreational, Educational, Religious, or Scientific Uses in the Area. The SUMC Project would not conflict with residential, recreational, educational, religious or scientific uses. (NI)

Several of the uses identified under this criterion occur within the vicinity of the SUMC Sites. There are residences at 1100 Welch Road, across Welch Road from the Main SUMC Sites, and there are residences and living facilities (such as the Stanford West Apartments, Ronald McDonald House and the Hyatt Classic Residences [an independent and assisted-care facility]) located along Sand Hill Road. There are recreational fields adjacent to the SUMC Sites within Stanford University. The nearest scientific and educational facilities are Stanford University buildings, the closest of which is less than 50 feet from the Main SUMC Site. The closest schools to the SUMC Sites are Packard Children's Hospital School at the LPCH Hospital, Palo Alto High School, approximately 0.7 miles east of the SUMC Sites, and Addison Elementary School, approximately 1.2 miles northeast. The nearest private schools are Castilleja School, 1.1 miles northeast, and Montessori School, approximately 1 mile northeast. Finally, there is a church (Memorial Church) on the Stanford University Campus, approximately 0.4 miles from the SUMC Sites and a chapel in the SHC Hospital.

A land use conflict would occur if a project, after its construction, would significantly impede the function of surrounding uses. The function of surrounding uses would be impeded if localized noise, air emissions, or hazardous materials exposure produced by the SUMC Project would disrupt activities and functions of surrounding land uses. Construction-period emissions are not applicable to this land use impact because construction activities are not land use specific and are temporary, and as such do not apply to inconsistencies between land uses. Use restrictions within Municipal Code zoning districts are generally intended to prevent incompatible uses from being located next to each other. However, in the event that an existing use would be intensified and reconfigured, such as under the SUMC Project, an examination of the changes in development against a site's relationship with surrounding uses is warranted.

The SUMC Project would not introduce a new land use but would intensify and reconfigure the established hospital, clinic/medical office, and research uses on the SUMC Sites. The nearest sensitive use, per the subject significance criteria, are the residences at 1100 Welch Road (across Welch Road from the Main SUMC Site). Air and noise emissions from the SUMC Project are addressed in Sections 3.5 and 3.7 of this EIR, respectively. Hazards and hazardous materials impacts are addressed in Section 3.12.

Section 3.7, Noise, indicates that of the proposed seven new emergency generators between SHC and Welch Road could be heard at the residences in exceedance of City standards. However, the Noise section also states that the proposed emergency generators would operate under a very restrictive testing schedule (which most likely would occur during weekday daytime hours). Each generator would be tested once per week for 30 minutes. As such, even if during these testing periods noise could exceed City standards for average noise at the residences, these occurrences would be sporadic and during times when residents would typically be out of their homes. As such, the generators would not impede the residential function of the nearby homes. In addition to emergency generators, increased ambulance operations would amplify the daily average noise levels (i.e., L_{dn}) along the ambulance routes, particularly at the Stanford West Apartments. Although ambulance noise would significantly increase over existing conditions (see Section 3.7, Noise), the ambulance noise would not impede the function of the adjacent residential uses, even if it would result in sporadic and brief audible annoyance. As such, the noise from the generators and emergency vehicles would not conflict with the nearest residences.

Additionally, no significant impacts related to hazardous materials would occur, due to the federal, State, and local regulations that the SUMC Project must comply with. Lastly, while operational emission of the SUMC Project would exceed regional standards (see Section 3.5, Air Quality), the emissions would be significant on a regional rather than a local level, and would not impede the function of any existing nearby land use. As such, the SUMC Project would not conflict with nearby residential, recreational, educational, religious, or scientific uses.

LU-3. Physical Division of an Established Community. The SUMC Project would not physically divide an established community. (NI)

While the SUMC Sites are located along boundary of Palo Alto and Santa Clara County, the SUMC Project would be an urban infill project at sites that currently support hospital, medical office/clinic, and research facilities. No physical barriers would be added that would physically separate the SUMC Sites from their surroundings. Existing land use connectivity and circulation routes within the bounds of the SUMC Sites and between the SUMC Sites and their environs would be maintained, and enhanced in some locations (such as Durand Way). No impact would be expected to occur.

LU-4. Farmland Conversion. The SUMC Project would have no impact on conversion of farmland to non-agricultural uses. (NI)

The SUMC Project would require the annexation of a small (approximately 0.75-acre) area from Santa Clara County. This area is designated for Major Educational and Institutional Uses in the Palo Alto Comprehensive Plan. The parcel retains an A1 agricultural district zoning in the Santa Clara County Zoning Map. However, the A1 zoning allows university uses if a conditional use permit is obtained, and Stanford has a use permit that allows academic and support uses on this site. No agricultural uses actually occur within the area, which contains an ancillary landscaped area for existing medical buildings. Thus, development of the area for academic uses would result in no impact on farmland.

LU-5. Adverse Changes to Overall Existing or Planned Land Uses in the Area. Because the SUMC Project would intensify the planned uses within the SUMC Sites, the SUMC Project would have a significant impact pertaining to on-site character and views. (S)

The SUMC Project would not change the overall existing or planned land use patterns in the area surrounding the SUMC Sites. Surrounding land uses in the area include medical office uses outboard (primarily) of Welch Road; permanent and temporary residential and assisted care uses along Sand Hill Road; the San Francisquito Open Space along Sand Hill Road; the Stanford Shopping Center; El Camino Park to the east of El Camino Real; and portions of the Stanford University campus. The SUMC Project would not directly or indirectly change the type of land uses, and would result in no impact to the surrounding development pattern.

However, as discussed in Section 3.3, Visual Quality, the increase in building intensity and massing at the SUMC Sites would result in a significant impact on on-site character and views. In addition, the proposed intensity of the SUMC Project is beyond what is planned in the current Comprehensive Plan and zoning. Without implementation of the City's Architectural Review process to ensure appropriate alignment of proposed structures, this increase in massing would have a significant impact on on-site character and views.

MITIGATION MEASURE. Mitigation Measure VQ-2.1, presented in Section 3.3, Visual Quality, requires and ensures compliance with ARB recommendations for final design and would reduce impacts from increased intensity under the SUMC Project. Based on the SUMC Project design guidelines, the Architectural Review would consider, among other factors, whether the SUMC Project has a coherent composition and whether its bulk and mass are harmonious with surrounding development. Thus, implementation of Mitigation Measure VQ-2.1 would reduce the significant impacts on overall surroundings to a less-than-significant level. (LTS)

Cumulative Analysis

The geographic context for the cumulative land use impacts includes the Project Vicinity, as defined under Existing Conditions. The SUMC Project would have no impacts regarding division of an established community and farmland conversion. Per Appendix B, no other foreseeable City projects would change the existing type of land uses adjacent to the SUMC Sites; as such, there would be no cumulative impact related to land use compatibility. Therefore, the SUMC Project would have no potential to contribute to cumulative impacts regarding these issues, and these issues are not discussed further. Also, conflicts with adopted land use plans and policies is a project-specific rather than cumulative issue, and as such, this issue is also not discussed below. However, the SUMC Project could have a potential to contribute to cumulative or adverse changes to existing intensity.

LU-6. Cumulative Impacts on Changes to Overall Existing or Planned Land Uses in the Area. The SUMC Project, in combination with other reasonably foreseeable probable future development in the area, would have a less-than-significant cumulative impact on overall existing or planned land uses in the vicinity of the SUMC Sites. (LTS)

The geographic context for the cumulative land use impacts includes the Project Vicinity, which is a distinct planning area in the City. The other reasonably foreseeable probable developments in this context include demolition of existing medical office structures and construction of a three-story medical office building at 777 Welch Road.

Any major development within the City, including the SUMC Project and other adjacent projects, such as the construction of a three-story replacement medical office building at 777 Welch Road, would be subject to the City's Architectural Review process. Section 18.76.020 of the Municipal Code states that no permit required under Title 2, Title 12, or Title 16 shall be issued for a major project (a project involving the construction of a non-residential building of over 5,000 square feet) unless an application for Architectural Review is reviewed, acted upon, and approved or approved with conditions. The ARB reviews development projects against rigorous criteria and provides its recommendations, to be acted upon by the Planning Director or City Council. Architectural Review approval requires findings concerning the resulting visual character of each subject project (see Applicable Plans and Regulations). Therefore, in light of the required Architectural Review for all projects within City limits, cumulative impacts would be less than significant.

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3.3 VISUAL QUALITY (AESTHETICS)

Introduction

This section discusses how development of the SUMC Project would affect the existing visual quality in and around the SUMC Sites. Visual quality pertains to how people see and experience the environment, particularly its visual character. Visual character consists of spatial and scale relationships, and the line, form, color, and texture of an area's natural features and man-made elements. Natural features include landforms, street trees, rock outcrops, vegetation, and water bodies. Man-made elements include buildings, structures, parking areas, roads, roadway interchanges and overpasses, above-ground utilities, signs, and lighting fixtures. The SUMC Project's impacts on visual quality are discussed in terms of:

- Changes to the existing visual character of the SUMC Sites and their immediate surroundings;
- Obstruction or alteration of views of protected resources under the Comprehensive Plan, such as but not limited to the foothills of the Santa Cruz Mountains;
- Compliance with the City's urban design policies, contained in the City of Palo Alto Municipal Code (Municipal Code), including Title 18 Zoning Ordinance (Zoning Ordinance); and
- Introduction of new sources of light, glare, and shadows.

To determine the baseline for this analysis, PBS&J conducted a visual survey of the SUMC Sites and surrounding areas on November 7, 2007. PBS&J documented existing structures, landscaping, paths, streets, and open space; noticeable regional topographic features; and views from sensitive public vantage points and circulation routes of aesthetic importance. This baseline is compared to post-development conditions anticipated at full buildout in 2025. Full buildout conditions are depicted through visual simulations, prepared by William Kanemoto and Associates. Post-development conditions are also depicted through a verbal description of how proposed changes would affect the baseline (existing conditions).

Visual quality issues/comments identified in letters responding to the NOP and oral and written comments during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project were considered in preparing this analysis. Comments pertained to impacts of proposed buildings on views from residential areas, from Sand Hill Road, and from where the structures would be most visible; shadow impacts; loss of open space; and impacts on views of the Hoover Pavilion. These comments were received from the Palo Alto Planning and Transportation Commission and City Council, City of Menlo Park, and private individuals and organizations. Members of the City Council also requested during the scoping period that views from heavily-travelled roads be addressed.

Existing Conditions

Visual Character

Regional Character. The City is located on the San Francisco Peninsula (Peninsula) in Santa Clara County, approximately 20 miles north of San Jose and 32 miles south of San Francisco. The Peninsula is bounded by the Pacific Ocean on the west and San Francisco Bay (Bay) on the east. Figure 2-1 in the Project Description shows the SUMC Sites within this regional setting.

The San Andreas Fault Rift Zone is one of the defining physical features of the Peninsula. The San Andreas Fault Rift Zone runs parallel to I-280 through Santa Clara County, forming the Santa Cruz Mountains. The mountain range divides the Peninsula into two parts: the Bay side to the east and the Coast side to the west. The Bay side of the Peninsula is warm and relatively dry, while the Coast side is cool and damp. Most urban development occurs on the Bay side of the Peninsula, while the Coast side is principally rural. The Santa Cruz Mountains borders Santa Clara County to the west, dividing it from neighboring Santa Cruz and San Mateo Counties. The SUMC Sites are located in Santa Clara County, on the Bay side of the Peninsula. The foothills[1] of the Santa Cruz Mountains are visible from the City and are afforded view protection by the City's Comprehensive Plan.

The City is bordered by the cities of Menlo Park to the north, East Palo Alto to the east, Mountain View and Los Altos to the south, and the Town of Los Altos Hills to the southwest. Unincorporated Santa Clara County, which includes most of the Stanford University campus, also runs along the western border of the City. With the exception of the Town of Los Altos Hills, all of the aforementioned cities, including Palo Alto, fall within the relatively flat lowlands that extend from the Bay towards Junipero Serra Boulevard,[2] which is an arterial that runs in a north-south direction 1 mile west of the SUMC Sites.

The slope in the lowlands is less than five percent. West of Junipero Serra Boulevard elevations rise, peaking at the crest of the Santa Cruz Mountains, and Pulgas Ridge. The peak elevation of this mountain range is around 700 feet above mean sea level (msl). Across the San Francisco Bay to the east, the East Bay hills are also visible in the distance. The average elevation of the City is 56 feet above msl.

The densest development in the region is typically located in the lowlands. Such development includes commercial and industrial buildings, and multiple-family and single-family homes. Breaks in this dense development pattern include open spaces along the waterfront, typically east of US 101, and large surface parking areas or large setbacks along major arterials. Near the SUMC Sites, the Stanford University campus and San Francisquito Creek provide additional open space areas. Development density gradually decreases westward, as elevation increases. While some of the nearby foothills are highly developed, large open space areas, such as the Arastradero Open Space Preserve, Windy Hills

1 Foothills are hills near or at the base of a mountain or mountain range.
2 Junipero Serra Boulevard is known as Alameda de las Pulgas to the north of Palo Alto and Foothill Expressway inside City limits.

Open Space, Foothills Park, and Wunderlich County Park, are located in the foothills. The foothills next to the Stanford University campus are the least developed.

Project Vicinity. As stated in the Section 2, Project Description, the Project Vicinity is generally bounded to the north by San Francisquito Creek, to the east by El Camino Real, and to the south and west by unincorporated Santa Clara County (containing Stanford University lands).[3] The SUMC Sites are within the Project Vicinity; the SUMC Project would be located entirely within the SUMC Sites but not within the entirety of the Project Vicinity. The heavily vegetated San Francisquito Creek open space runs along the Palo Alto and Menlo Park border. This northwestern portion of the City is relatively flat, with a west-east elevation gradient of less than one percent. Development in the Project Vicinity is architecturally diverse but predominantly manicured and suburban. However, the adjacent portions of the Stanford University campus include a mix of institutional development, open fields, and undeveloped oak woodlands.

Visibility of Regional Features. As previously described under the Regional Character, the major natural topographical features in the region include the Santa Cruz Mountains to the west of the City, and the San Francisco Bay and East Bay hills to the east. On clear days, the foothills of the Santa Cruz Mountains are visible in the distance facing west and southwest from many Project Vicinity vantage points and from adjacent streets, residential areas, and open spaces. The Bay and East Bay hills are not visible from the Project Vicinity. The flat topography and low elevation of the Project Vicinity restrict sightlines such that that no single feature is visible throughout the entire Project Vicinity. The visibility of regional topographic features from local vantage points within and surrounding the Project Vicinity, including public streets and open spaces, is discussed in more detail under the Viewsheds and View Corridors subsection below.

Development Pattern and Architectural Character. Building heights within the Project Vicinity range from approximately 15 to 65 feet tall, and buildings immediately east of the Main SUMC Site are as tall as 88 feet. The 65-foot-tall Hoover Pavilion (without rooftop appurtenances) is the tallest building within the Project Vicinity (it is 110 feet tall to the highest point of the rooftop appurtenance). Building height at the Main SUMC Site ranges from approximately 15 to 50 feet (without rooftop appurtenances), and total building footprint is roughly 650,000 square feet. The 70-acre Stanford Shopping Center, in the eastern portion of the Project Vicinity, consists of large surface parking lots and commercial buildings with heights of approximately 50 feet (without rooftop appurtenances).

Architectural details and façade treatments in the Project Vicinity are disparate, ranging from glass and steel, terracotta, Art Deco, modern-style, and ornate concrete screen treatments. Most of the buildings in the Project Vicinity, however, have minimal ornamentation. Some buildings in the Project Vicinity, such as the LPCH and Hoover Pavilion Site sheds, feature broken massing and staggered setbacks, resulting in irregular building footprints and façades. Other buildings in the Project Vicinity, such as the 1959 Hospital Building complex and retail buildings in the Stanford Shopping Center, have box-like massing.

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3 As stated in the Section 2, Project Description, true northwest is considered project north for the purposes of this analysis.

Vegetation and Open Space. Vegetation in the Project Vicinity is patchy, resulting from irregular landscaping treatments that include grassy areas, manicured lawns, formal street trees and sidewalk landscaping, and informal patches of large, mature trees. Palo Alto regulates "street trees" which are trees commonly achieving 10 feet in height and capable of being shaped and pruned to develop a branch-free trunk at least 9 feet in height, which are located along public streets, boulevards, alleys and walks, public parks, or in public places in the City. Street trees line the public thoroughfares in the Project Vicinity (not including Campus Drive West, Vineyard Lane, and the portion of Pasteur Drive south of Blake Wilbur, all of which are private streets). Street trees are particularly dense along Sand Hill Road. While large, mature trees occur throughout the sites, along building edges and within parking lots, patches of large trees are most dense at the 1101 Welch Road property and at the Hoover Pavilion Site.

Adjacent to the Project Vicinity, landscaping is also varied. The open space corridor along San Francisquito Creek contains thick riparian vegetation and a pedestrian trail. El Camino Park is east of the Project Vicinity and includes a grassy playfield bordered by street trees. Although much of the Stanford University campus to the west and south of the Project Vicinity consists of wooded and grassy open space, the portion of the campus west of the Main SUMC Site contains several large structures surrounded by formal landscaping and lawns.

SUMC Sites. The SUMC Sites comprise approximately 66 acres and include two sub-sites: the approximately 56-acre Main SUMC Site and the approximately 9.9-acre Hoover Pavilion Site. The Main SUMC Site is off Sand Hill Road and is primarily bounded to the north and east by Welch Road and to the south and west by Stanford University lands in unincorporated Santa Clara County. The Hoover Pavilion Site is about 1,700 feet east of the Main SUMC Site, at the southeast corner of Quarry Road and Palo Road. The SUMC Sites cumulatively feature approximately 20 acres of building footprint, 19 acres of landscaped area, and 29 acres of paved surfaces.[4]

Approximately 1,562 trees, including native and non-native ornamental species, have been identified on the SUMC Sites. Species are numerous and include but are not limited to coast live oaks, coast redwoods, Chinese pistache, Canary Island pine, Maidenhair tree, and Japanese flowering cherry. Based on the City listing, there are no Heritage Trees on the SUMC Sites. However, there are 176 native oaks and redwoods on the SUMC Sites that are large enough to be designated as Protected Trees under the City of Palo Alto's Tree Preservation and Management Regulations.[5] The occurrence of Protected Trees are addressed in more detail in Section 3.9, Biological Resources.

Main SUMC Site. Generally, development character within the Main SUMC Site is institutional. The Main SUMC Site is the most densely developed site in the Project Vicinity, featuring an interconnected series of hospital buildings, generally including the Stanford Hospital, Hospital Expansion, and LPCH (see Figure 2-5 in Section 2, Project Description). Clinic buildings and a multiple-story garage are also among this series of buildings. As described previously, building height at the Main SUMC Site

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4 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 4, Figure 4-8a.

5 Ray Morneau, Certified Arborist, *Certified Arborist's Tree Inventory for Stanford Medical Center Area Project*, September 2007.

ranges from approximately 15 to 50 feet (up to three stories) without rooftop appurtenances, or approximately 15 to 65 feet, with rooftop appurtenances. Also, buildings in adjacent portions of the Stanford University campus are as tall as 88 feet, without rooftop appurtenances. Total building footprint is roughly 650,000 square feet and is most concentrated at the 1959 Hospital Building complex. Development intensity decreases to one- and two-story structures and surface parking areas just inboard of Welch Road. This development pattern continues just north and east of Welch Road, where residences, office uses, and Sand Hill Road (a designated scenic road) are located.

Buildings at the Main SUMC Site include various architectural styles that incorporate glass and steel, and ornate concrete screen treatments. The most visually distinctive structure in the Main SUMC Site is the 1959 Hospital Building complex (designed by Edward Durell Stone and thus also called the Stone Building complex). The 1959 Hospital Building complex, located at the terminus of Pasteur Drive in the Main SUMC Site, features a formalist modern architectural style with a highly ornamental and geometric façade (see Section 3.8, Cultural Resources, for a further discussion of the building's architectural style). The complex is approximately 38 feet tall without the rooftop appurtenance (it is 55 feet tall to the highest point of the rooftop appurtenance). It should be noted that this complex is on the southern end of Pasteur Drive and is not visible from Sand Hill Road and residences along the road, as explained later under Viewsheds and View Corridors.

The Main SUMC Site includes walkways, courtyards, and entryways to hospital buildings. Pasteur Drive is a distinctive frontage to the 1959 Hospital Building complex and features an open lawn, fountain, and a courtyard containing formal hedges, stone paths, benches, street banners, and mature trees. Pasteur Drive is partially visible from the Sand Hill Road scenic route, as explained later under Viewsheds and View Corridors. The open spaces within the site provide ample sky views, and street-level amenities provide a pedestrian-oriented character within the site.

Of the 176 Protected Trees at the SUMC Sites, 60 Protected Trees on the Main SUMC Site appear to be within or sufficiently close to new building footprint areas or paved areas associated with site reconfiguration such that they may be affected by SUMC Project construction. Out of these 60 Protected Trees, the City has designated approximately 23 Protected Trees as having both biological and aesthetic resource characteristics. A "Biological Tree Resource" is a protected category oak or redwood of a certain size as defined in the Palo Alto Municipal Code, Chapter 8.10, Tree Preservation and Management Regulations. An "Aesthetic Tree Resource" is a Protected Tree that is deemed important to the SUMC Project, as designated by the Department of Planning and Community Environment or the City Council, because it has one or more of the following qualities: functions as an important or prominent visual feature; contributes to a larger grove or landscape theme; and/or possesses unique character as defined in the designation of Heritage Trees (per Palo Alto Municipal Code Section 8.10.090). The 23 Protected Trees that are both biologically and aesthetically significant would require retention and preservation under the SUMC Project.[6] Section 3.9, Biological Resources,

[6] City of Palo Alto Department of Planning and Community Environment, Dave Dockter, Environmental Planner, "SUMC Environmental Impact Report Strategy: How the City will approach evaluation of the Tree Resources in the SUMC Project Area," memorandum, July 28, 2009.

discusses biologically and aesthetically significant Protected Trees in more detail; therefore, this topic will not be addressed further in this section.

Hoover Pavilion Site. The Hoover Pavilion Site consists of the 65-foot-tall Hoover Pavilion (without rooftop appurtenance), the Nurses' Cottage, and several small storage sheds. With its rooftop appurtenance, the Hoover Pavilion reaches 110 feet in height. There is also a childcare center at the southeast corner of the site. Total building footprint at the Hoover Pavilion Site is 37,884 square feet with a FAR of approximately 0.25.[7]

The Hoover Pavilion itself is a dominant and distinguishing structure at this site and in the Project Vicinity. It has a T-shaped floor plan with a five-story central block, a six-story tower, and four-story wings. The building's stepped pyramid shape (referred to as a "ziggurat" in architectural terms), vertical emphasis of window bays, and stylized floral and geometric panels and fixtures typify the architectural style of the Art Deco movement (see Section 3.8, Cultural Resources, for a further description of the Hoover Pavilion's architectural style). The Hoover Pavilion features terra cotta-colored walls and a coral-colored roof, which stand out in contrast to the lighter-colored buildings and vegetation in the Project Vicinity. Also, as one of the taller buildings in the Project Vicinity, the Hoover Pavilion is visible from many vantage points in the Project Vicinity, such as the Stanford Shopping Center and LPCH. The Nurses' Cottage, located southwest of the Hoover Pavilion, is a one- to two-story building with an irregular footprint.

The majority of the Hoover Pavilion Site is covered by surface parking lots, although large trees and landscaped walks also surround the buildings within the Hoover Pavilion Site. Of the 176 Protected Trees at the SUMC Sites, 11 Protected Trees at the Hoover Pavilion Site appear to be within or sufficiently close to new building footprint areas or paved areas associated with site reconfiguration such that they may be affected by project construction. However, the City has not deemed these trees to have both biological and aesthetic resource characteristics.

Viewsheds and View Corridors

A "viewshed" is an area of land, water, and/or other environmental and physical elements that is visible from a fixed vantage point. Viewsheds can be expansive or relatively small depending on observer position, topography, and the presence of foreground obstructions. The term "view corridor" refers to views along a path, roadway, or other horizontal corridor. View corridors often have limited visibility to either side due to obstructions, such as development or vegetation; a view from a view corridor that has limited lateral visibility is referred to as a channelized view.

The below descriptions of the El Camino Real Gateway, views from scenic routes, views of foothills from public roads, and view of the SUMC Sites from other sensitive vantage points are provided here to support the analysis discussions under Impact VQ-3 later in this section. Discussions under Impact

7 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 1, Table 1-1.

VQ-3 address whether the SUMC Project would significantly alter public viewsheds, view corridors, or scenic resources.

Appearance of El Camino Real Gateway. A gateway is a key area of entry and exit into a city or district and is typically located along a major transportation route. As stated above, the Project Vicinity is generally bounded to the north by San Francisquito Creek, to the east by El Camino Real, and to the south and west by unincorporated Santa Clara County. Therefore, the El Camino Real Gateway is to the northeast of the Project Vicinity. El Camino Real (State Route 82) is a State Historic Route and major arterial that runs north-south from San Francisco to San Jose. The El Camino Real Gateway is a six-lane arterial with a grassy center divide. Street trees line the edges of this gateway. It is bordered by the San Francisquito Creek riparian corridor and the parking lots of the Stanford Shopping Center to the west and by the wooded and field portions of El Camino Park to the east. The gateway features light posts and painted crosswalks.

El Camino Real is approximately 0.5 miles east of the Main SUMC Site and less than 0.1 miles east of the Hoover Pavilion Site. The Stanford Shopping Center lies between the Main SUMC Site and the El Camino Real Gateway, and largely obstructs views of the Main SUMC Site from the gateway. There is wooded open space between the Hoover Pavilion Site and El Camino Real, and so the Hoover Pavilion Site is partially visible from El Camino Real. Regarding views of foothills from the El Camino Real Gateway, there are minor background views of foothills of the Santa Cruz Mountains from El Camino Real.

Figure 3.3-1 shows the minor background view of the foothills from El Camino Real near Sand Hill Road; existing structures at the SUMC Sites are not visible from this vantage point. Figure 3.3-2 illustrates the minor background views of the foothills from the El Camino Real and Quarry Road intersection and, as shown, the Hoover Pavilion rooftop appurtenance is visible from this vantage point.

Views from Sand Hill Road Scenic Route. Comprehensive Plan Program L-71 recognizes Sand Hill Road, University Avenue, Embarcadero Road, Page Mill Road, Oregon Expressway, I-280, Arastradero Road (west of Foothill Expressway), Junipero Serra Road/Foothill Expressway, and Skyline Boulevard as scenic routes. The Main SUMC Site is visible from Sand Hill Road, and both SUMC Sites are not visible from other recognized scenic routes due to distance, topography, or intervening structures or landscaping.

Sand Hill Road provides a linkage between El Camino Real and I-280, a California Scenic Highway. Generally, suburban-scale development flanks Sand Hill Road to the north and open spaces within Stanford University lands flank this road to the south (except along the Project Vicinity, where development intensifies south of Sand Hill Road). Informal groupings of oak trees, California natives, and eucalyptus set in natural grasses and wildflowers are common landscape elements. Trees run along most portions of Sand Hill Road. For the purposes of this discussion, Sand Hill Road is further described in two segments: the western segment runs between I-280 and Santa Cruz Avenue, and

Source: PBS&J, 2008.

FIGURE 3.3-1
Existing View Looking Southwest at El Camino Gateway from Menlo Park

D41357.00

Source: PBS&J, 2008.

FIGURE 3.3-2
Existing View Looking West from El Camino Real and Quarry Road

D41357.00

comprises the higher-elevation portions of the Sand Hill Road. The eastern segment runs between Santa Cruz Avenue and El Camino Real, and comprises the lower-elevation portions of the Sand Hill Road.

Western Segment of Sand Hill Road. This portion of Sand Road is at a higher elevation, roughly upward of 200 feet above msl. On clear days, the view from this western part of Sand Hill Road features distant views of the foothills of the Santa Cruz Mountains to the west and the Bay to the east, although these views are intermittent and channelized. The East Bay hills are intermittently visible. Facing east along this road, taller structures in and around the Project Vicinity and east of El Camino Real are visible. The views of the East Bay hills are partially obstructed by these taller structures, including the Stanford University 285-foot-tall Hoover Tower (within Stanford University and outside the SUMC Sites), the 110-foot-tall rooftop appurtenance of the Hoover Pavilion, and taller office structures near Downtown Palo Alto (east of El Camino Real). Structures within the Main SUMC Site are barely visible from this portion of Sand Hill Road due to obstructions from vegetation and the one- to two-story clinic/office buildings outboard of Welch Road.

Eastern Segment of Sand Hill Road. The eastern stretch of Sand Hill Road differs in character from the western portion. Due to lower and more flat topography, taller structures such as the Hoover Tower are not visible. Development intensifies and is most apparent between Vineyard Lane and El Camino Real. Still, on clear days, channelized views of foothills are visible facing east (towards the East Bay hills), and background views of foothills are partially visible facing west (towards the Santa Cruz Mountains). The Main SUMC Site is along the lower, eastern stretch of Sand Hill Road (from Pasteur Drive to El Camino Real). While this lower portion of the corridor is lined with street trees, vegetation is less dense and building mass increases compared to the western segment.

In the vicinity of the Main SUMC Site, Sand Hill Road intersects Pasteur Drive but is separated from the Main SUMC Site by properties outboard of Welch Road. The Main SUMC Site is partially visible at the intersection of Pasteur Drive and Sand Hill Road, while most of the Main SUMC Site is obstructed by trees and buildings. As shown in Figure 3.3-3, views of the Main SUMC Site include Pasteur Drive (the main driveway into the Main SUMC Site), banners, street lamps, and no views of hillsides or expansive open spaces. Also, existing buildings within the Main SUMC Site are minimally visible from this location.

As shown in Figure 3.3-4, there are distant views of the foothills of the Santa Cruz Mountains looking west from some locations along the eastern portion of Sand Hill Road, such as the Sand Hill Road/Arboretum Road intersection. Along this intersection, the top of the existing LPCH structure is visible in the background and partially obstructs those foothill views.

FIGURE 3.3-3
Existing View Looking South along Pasteur Drive from Sand Hill Road

Source: PBS&J, 2008.

D41357.00

Source: PBS&J, 2008.

FIGURE 3.3-4
Existing View Looking Southwest from Sand Hill Road and Arboretum Road Intersection

D41357.00

Views from Public Streets. Comprehensive Plan Policy L-3 states that the City should guide development to respect views of the foothills from public streets. Accordingly, this discussion is limited to a description of the views of foothills that may be affected by the SUMC Project. Public streets around the SUMC Sites include El Camino Real, a portion of Pasteur Drive, Welch Road, Arboretum Road, Quarry Road, and Sand Hill Road. El Camino Real and Sand Hill Road are addressed above, and the remaining streets are discussed below.

- *Quarry Road.* Quarry Road is a four-lane arterial that runs in an east-west direction along the southern boundary of the Main SUMC Site and the northern boundary of the Hoover Pavilion Site. Portions of Quarry Road feature minor, channelized views to panoramic, but background, views of the foothills of the Santa Cruz Mountains. For example, the eastern portion of Quarry Road, from El Camino Real past the Hoover Pavilion Site, features channelized views of the foothills. On other portions of Quarry Road, views of foothills are limited by vegetation and development on either side of the view corridor. Figure 3.3-2, Figure 3.3-5, and Figure 3.3-6, show views from Quarry Road.

- *Arboretum Road.* Arboretum Road runs within the Project Vicinity but not adjacent to the SUMC Sites. Arboretum Road runs parallel to Vineyard Lane and transects the Stanford Shopping Center. Surrounding development consists of retail buildings and parking lots. There are some views of the western foothills from Arboretum Road, at its intersection with Sand Hill Road (see Figure 3.3-4).
- *Pasteur Drive.* Pasteur Drive extends south off Sand Hill Road and is the main driveway into the Main SUMC Site. Pasteur Drive is a public road from Sand Hill Road up to its intersection with Blake Wilbur Drive. Beyond that, Pasteur Drive is a private loop road. The public portions of Pasteur Drive feature open fields, grassy areas within its center divide, manicured lawns, mature trees, an art sculpture, lightposts and banners, various medical buildings, and parking garages. Distant views of the foothills of the Santa Cruz Mountains can be seen facing west from portions of Pasteur Drive where there are open fields.
- *Welch Road.* Welch Road bounds the Main SUMC Site to the north and west. Views of hillsides at street level are largely obstructed by the height of existing development and by mature trees. Therefore, there are no significant views of the foothills from Welch Road.

Views from Other Vantage Points

Considerations in Determining Sensitive Vantage Points. This section presents a discussion of the factors considered in determining whether impacts to views are significant, and which viewpoints, other than those derived from the Comprehensive Plan, should be used to determine whether there are any single uses that are inappropriate in size and scale to the surrounding uses, and whether the SUMC Project promotes high quality, creative design, and site planning that is compatible with surrounding development and public spaces.

Source: PBS&J, 2008.

FIGURE 3.3-5
Existing View Looking Northwest from Quarry Road and Vineyard Lane

D41357.00

Source: PBS&J, 2008.

PBS&J

FIGURE 3.3-6
Existing View Looking Northwest from El Camino Real and Quarry Road

D41357.00

- *Population* addresses the number of people with views of a proposed project. Road designations (e.g., highway, arterial street, or local roadway) provide an indication of the number of potential observers along travel corridors. Open spaces defined by the Comprehensive Plan are assumed to have a large number of potential observers.

- *Attention* is an index of the amount of attention viewers may devote to scanning portions of the landscape. A viewer may be distracted from observing a proposed project by competing elements, such as structures (e.g., stores, houses), planned attention-getters (e.g., billboards, traffic signs), transportation elements (e.g., moving traffic, parked cars, intersections), and human activities (e.g., pedestrians, bicyclists). Generally, viewers who move more quickly through a landscape have a lower attention index than stationary viewers; thus, stationary viewers are considered to be more sensitive. Most environments include a mix of stationary, slow-moving, and fast-moving viewers.

- *Observer position* refers to the relative location of an observer looking upon a proposed project. The sensitivity of a vantage point depends on the observer's position on both vertical and horizontal planes:

  - *Vertical plane*. When an observer is above the viewed object (viewer superior), views can be direct with little visual blockage. When an observer is below the surrounding landscape (viewer inferior), views of project facilities are more readily blocked or partially screened by vegetation, landforms, and structures. When a viewer is at the same level as the viewed object, some characteristics of both the inferior and superior viewer positions occur.

  - *Horizontal plane*. When an object is observed at a distance from a given vantage point it appears to be smaller than it actually is. A distant object makes up a much smaller portion of the observer's field of vision than a proximate object. The average angle for human vertical field of vision is approximately 90 degrees, of which approximately 60 degrees is above the horizontal line of sight[8] and of which 30 is below the line of sight.[9] In simple terms, a 100-foot-tall object located 500 feet from a given vantage point would represent approximately 11 percent of the vertical height of the observer's field of vision above the horizontal line of sight.[10] At 1,000 feet, the same object would represent only 5.5 percent of the vertical height of the observer's vertical field of vision above the line of sight.

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8 The normal human line of sight is at a 15 degree downward incline. The horizontal line of sight is parallel with the ground.

9 Guastello, Stephen J., 2006. Human Factors Engineering and Ergonomics. New Jersey: Routledge, 302 pages.

10 This estimate assumes flat terrain and a lack of obstructions in the visual foreground. The calculation is based on simple trigonometry that does not fully account for the complex optics of the human eye, but is nonetheless commonly used in engineering and ergonomics fields. The perceived height of an object relative to the height of the total field of vision, A, is calculated as: (H-L)/X, where H is the height of object being viewed, L is the height of viewer's line of sight, and X is the height of the vertical plane of the observer's field of vision as measured at D, the distance from the observer to the object. X is calculated as: D(tangent 60), which accounts for the 60 degree angle of the human field of vision above the line of sight. Therefore, $A_1 = (100-5)/(500(\text{tangent}60)) = 0.1097$, and $A_2 = (100-5)/(1000(\text{tangent}60)) = 0.0548$.

- *A scenic vista* is a location that offers a high quality, harmonious, and visually interesting view. A proposed project could obstruct views from the vista or introduce visual elements that dominate or upset the textures, colors, lines, and overall visual quality of the view.
- *The type of land use* at the viewer's location is dependent on surrounding views to appropriately maintain its function. For example, a scenic recreational trail or scenic route is dependent on surrounding scenic views to appropriately maintain its function; therefore, trail users or travelers would be sensitive to changes in the surrounding views. In general, public land uses are considered more likely to be visually sensitive, depending upon the existing views, while most private uses are not. As stated in the Introduction, however, common residential areas are considered a visually sensitive use in this analysis.

The vantage points described below are identified as visually sensitive based on the factors above.

Sensitive Vantage Points Relative to the SUMC Sites. Sensitive vantage points that could be impacted by the SUMC Project include residential uses in the vicinity of the SUMC Sites. The multiple-family apartments at 1100 Welch Road are directly across Welch Road from the Main SUMC Site. The Stanford West Apartments on Sand Hill Road are in an inferior (lower) viewing position due to topography and are surrounded by vegetation along San Francisquito Creek. Views of the SUMC Site from this location are partially obstructed. Nonetheless, vantage points from both the multiple-family residences at 1100 Welch Road and at the Stanford West Apartments are considered sensitive to the SUMC Project due to proximity to the proposed modules that would be up to 130 feet tall.

It should be noted that this analysis considered residences within Menlo Park, just north of San Francisquito Creek. Based on PBS&J's site reconnaissance on November 7, 2007, this residential area features minimal to no views of the SUMC Sites due to (1) view obstruction by heavy vegetation along the San Francisquito Creek open space area; (2) view obstruction by structures between San Francisquito Creek and the Project Vicinity, such as the two- to three-story Ronald McDonald House; and (3) the level position of this area relative to the Project Vicinity. Based on these observations, the SUMC Project would have negligible potential to alter views from this area.

The San Francisquito Creek open space is an approximately 1,500-foot-long segment of wooded, riparian vegetation on the north side of Sand Hill Road. This area is not listed on the City's official listing of parks and preserves.[11] However, it is designated for open space uses in the Comprehensive Plan and includes a bicycle/pedestrian trail. A public bicycle and pedestrian pathway runs along San Francisquito Creek, which is not sensitive to SUMC Project development because of the intervening vegetation, Stanford West Apartments, and the Ronald McDonald House. As such, the portion of the pathway that runs parallel to the Main SUMC Site is not sensitive to the intensified development at that site, which would occur further away than the existing aforementioned developments.

[11] The City of Palo Alto's inventory of parks and preserves can be found on the City's website at http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=8560.

City Hall was also considered as a possible visually sensitive vantage point; however, the SUMC Sites would not be visible from open space areas at City Hall (at the ground floor level) due to the building's distance from the sites. Offices on the upper stories of this building are not considered visually sensitive.

Applicable Plans and Regulations

There are no relevant applicable State or federal regulations governing visual quality impacts; however, applicable local regulations are listed below. Applicable policies from the Palo Alto Comprehensive Plan are listed and discussed in Section, 3.2, Land Use.

Palo Alto Architectural Review

The Palo Alto Architectural Review process assesses the design of all proposed construction and proposed changes and additions to commercial, industrial, and multiple-family projects. The process requires a recommendation from the Architectural Review Board (ARB), which is composed of five members, at least three of whom are architects, landscape architects, building designers or other design professionals. Based on the recommendation of the ARB, architectural approval then is made by the Planning Director, or by the City Council.

Architectural review takes place before building permits are issued, and ensures that new development is compatible with the surrounding neighborhood and environment. The ARB weighs several design considerations when reviewing a project, including the following:[12]

- Integral Architectural Concept – the design should be cohesive, with a coherent composition.
- Bulk and Mass – the proposed alignment with building lines on adjoining properties, modulation of mass, and land use should create an impression of harmony.
- Circulation – entries, exits, ADA access, and pedestrian features should be appropriately placed and pedestrian friendly.
- Landscaping – landscaping should be incorporated at the beginning of the design process and should be built into the design wherever possible (at the base of freestanding signs, within recessed windows, in-ground plantings, etc.).
- Lighting – the appropriateness of the lighting plan can be determined in part through photometric diagrams.
- Quality of Materials – the project should use authentic finishes (real stone, etc.).
- Colors – colors should harmonize with adjacent buildings and should be part of a carefully selected, limited palette.
- Existing Buildings – the project should indicate any proposed improvements to existing buildings.

[12] City of Palo Alto, 2001. Architectural Review Board Frequently Asked Questions.

- Signage – the signage program should be consistent with proposed uses and the surroundings.
- Hardscape – certain locations may require special paving to enhance the pedestrian experience, or permeable surfaces to reduce surface runoff.
- Streetscape – buildings should be compatible with the entire block, including trees and streetscape; streetscape should be considered in design concept.
- Ancillary Features - mechanical screening, downspout placement, awnings and sun shading systems should fit in with the overall design and efficiently achieve their intended function.
- Resource Management – the project should consider green building or sustainable design strategies.
- Alternatives to the Proposed Design – the design team should indicate any alternatives that were considered and why they were discarded.

The ARB also reviews projects for compliance with code requirements for building materials, signage, landscaping, setbacks, and other design elements specified in the Municipal Code (see Municipal Code policies below).

In preparation for the review of a project by a ARB, City staff prepares a staff report that provides project background, a summary of the project description, and a discussion of any issues related to Zoning or Comprehensive Plan compliance, and compliance with the Architectural Review Findings and Context Based Design criteria (if applicable). Recommended Findings and Conditions of Approval are also attached to the report. The project applicant must present his/her proposed design at a public hearing. During the hearing, ARB members, City staff, and the public may ask questions, make comments, or raise concerns about the project design. At the conclusion of the public hearing, the ARB may make a motion and vote on a recommendation to be forwarded to either the Director of Planning and Community Environment (Director) or the City Council (depending on the type of project) to formally approve (either with or without Conditions of Approval) or deny the project. The recommendation is forwarded to the Director or City Council for final decision. In the case of the SUMC Project, the ARB recommendation will be forwarded to City Council for consideration. The ARB does not have authority to approve or deny projects, so unless ARB recommendations are accepted by either the Director or City Council, the recommendations are not binding.

Architectural Review approval cannot be granted unless the project meets stringent criteria. As stated in Municipal Code Section 18.76.020, neither the Director, nor the City Council, shall grant architectural review approval, unless it is found that:

(1) The design is consistent and compatible with applicable elements of the Palo Alto Comprehensive Plan;

(2) The design is compatible with the immediate environment of the site;

(3) The design is appropriate to the function of the project;

(4) In areas considered by the board as having a unified design character or historical character, the design is compatible with such character;

(5) The design promotes harmonious transitions in scale and character in areas between different designated land uses;

(6) The design is compatible with approved improvements both on and off the site;

(7) The planning and siting of the various functions and buildings on the site create an internal sense of order and provide a desirable environment for occupants, visitors and the general community;

(8) The amount and arrangement of open space are appropriate to the design and the function of the structures;

(9) Sufficient ancillary functions are provided to support the main functions of the project and the same are compatible with the project's design concept;

(10) Access to the property and circulation thereon are safe and convenient for pedestrians, cyclists and vehicles;

(11) Natural features are appropriately preserved and integrated with the project;

(12) The materials, textures, colors and details of construction and plant material are an appropriate expression to the design and function and whether the same are compatible with the adjacent and neighboring structures, landscape elements and functions;

(13) The landscape design for the site, as shown by the relationship of plant masses, open space, scale, plant form, and foliage textures and color create a desirable and functional environment whether that landscape concept depicts an appropriate unity with the various buildings on site;

(14) Plant material is suitable and adaptable to the site, capable of being properly maintained on the site, and is of a variety that would tend to be drought resistant and to reduce the consumption of water in its installation and maintenance;

(15) The design is energy efficient and incorporates renewable energy design elements; and

(16) The design is consistent and compatible with the purpose of architectural review.

As of the preparation of this analysis, the SUMC Project is undergoing preliminary Architectural Review procedures, which have resulted in revisions to the originally-proposed site plans.[13] Further details on the review process that the SUMC Project will continue to undergo are provided later in the section, under Environmental Analysis.

[13] The original applications and site plans for the SUMC Project were submitted to the City in August 2007. As a result of refinement of functional adjacencies, the SUMC Project sponsors submitted revised site plans on April and October 2008, and again in June 2009. This EIR addresses the June 2009 site plans.

Palo Alto Municipal Code

Chapter 2.21 of the Municipal Code establishes the procedures and duties of the ARB, Planning Director and City Council discussed above. The ARB performs duties specified in Title 16 (Building Regulations), Title 18 (Zoning), and any other applicable sections of the Municipal Code.

Section 18.23.030 of the Municipal Code discusses design measures to minimize the visual impacts of lighting on abutting or nearby residential sites from adjacent roadways. This policy requires that:[14]

- Exterior lighting in parking areas, pathways, and common open space shall be designed to achieve the following: (1) provide for safe and secure access on the site, (2) achieve maximum energy efficiency, and (3) reduce impacts or visual intrusions on abutting or nearby properties from spillover and architectural lighting that projects upward.
- The use of high pressure sodium and metal halide are permitted light sources. Low pressure sodium is not allowed.
- Exterior lighting fixtures shall be mounted less than or equal to 15 feet from grade to top of fixture in low activity or residential parking lots and 20 feet in medium or high activity parking lots.
- Where the light source is visible from outside the property boundaries, such lighting shall not exceed 0.5 foot-candle as measured at the abutting residential property line.
- Interior lighting shall be designed to minimize nighttime glow visible from and/or intruding into nearby properties and shall be shielded to eliminate glare and light spillover beyond the perimeter property line of the development.
- Light fixtures shall not be located next to driveways or intersections, which obstruct clear sight distance triangles.
- Lighting of the building exterior, parking areas, and pedestrian ways should be of the lowest intensity and energy use adequate for its purpose, and be designed to focus illumination downward to avoid excessive illumination above the light fixture.
- Pedestrian and security lighting fixtures should be directed downward. Architectural lighting that projects upward from the ground as used in landscaping, courtyards, or building accent should be directed so as not to affect abutting land uses.
- Unnecessary continued illumination, such as illuminated signs or back-lit awnings, should be avoided. Internal illumination of signs, where allowed, should be limited to letters and graphic elements, with the surrounding background opaque. Illumination should be by low intensity lamps.
- Timing devices should be considered for exterior and interior lights in order to minimize light glare at night without jeopardizing security of employees. At the time of project approval the

14 Paraphrased for brevity.

project applicant must demonstrate how interior and exterior lighting sources will be reduced after operating hours or when the use of the facility is reduced.

Section 18.23.050 of the Municipal Code discusses design measures that shall be imposed on new developments in order to ensure compatibility with adjacent uses, particularly residential uses. This policy requires that:[15]

- Walls facing residential properties shall incorporate architectural design features and landscaping in order to reduce apparent mass and bulk.
- Loading docks and exterior storage of materials or equipment shall be screened from view from residential properties by fencing, walls, or landscape buffers.
- All required interior yards (setbacks) abutting residential properties shall be planted and maintained as a landscaped screen. For landscape buffers to provide a visual screen, trees and shrubs in the buffer area shall be installed in a manner that provides maximum visual separation of residential uses from the commercial or industrial use, taking into consideration topography and sight lines from residences.
- For sites abutting residential properties, a solid wall or fence between 5 and 8 feet in height shall be constructed and maintained along the residential property line where privacy or visual impacts are an issue.
- All exterior mechanical and other types of equipment, whether installed on the ground or attached to a building roof or walls, shall be screened from the public and, if visible and feasible, from overhead view.

Section 18.40.130 of the Municipal Code discusses landscaping design measures applying to new development projects. This policy requires the following:

- Utilities (e.g., transformer cabinets, pads, fiber optic trenching and above ground cabinets, large water check valves) and underground utilities shall not be placed within required landscaped areas, except where they will not preclude appropriate planting of trees and will be predominantly screened from public view.
- All landscaping within multi-family, commercial, and industrial zoning districts shall be equipped with automatic irrigation systems. Backflow preventers shall be located near the main structure to the maximum extent feasible, and shall be predominantly screened from public view.
- For all development within commercial and industrial zoning districts, lawn areas shall not exceed 15 percent of the planting area on a property. Required common areas, active recreation areas, and areas located within the public right-of-way between the curb and public sidewalk shall not count against such lawn area.

[15] Paraphrased for brevity.

- Landscaping within surface parking areas shall include tree plantings designed to result in 50 percent shading of parking lot surface areas within 15 years.
- All required perimeter yards shall be landscaped. The landscaping of these yards shall, at a minimum, consist of a combination of living vegetation, such as trees, shrubs, grasses or groundcover materials. The director may, however, allow a combination of hardscape and landscape to satisfy landscape requirements where the visual quality and screening functions of the hardscape/landscape area are maintained. Landscape buffering and screening shall be designed to create compatible relationships of scale and appearance with neighboring properties.
- Plant material shall be maintained in a healthy, disease-free, growing condition at all times. All required planting areas shall be maintained free of weeds, debris, and litter. The planning director may specify conditions of approval to assure that dead or diseased plantings are replaced in a timely manner and with adequate replacement plantings.

Title 8, Trees and Vegetation, of the Municipal Code protects two categories of Regulated Trees (Protected and Heritage Trees, Chapter 8.10, and Street Trees, Chapter 8.04) that occur on public or private property from removal or disfigurement. Chapter 18.76.020(d) of the Municipal Code also specifies that the architectural review process includes findings on "whether natural features are appropriately preserved and integrated with the project." A typical amenity tree that may be designated for protection is one that possesses beneficial characteristics, such as an outstanding highly visible tree specimen contributing to the existing site, neighborhood or community. Designated trees are established by the City when a project is subject to the Architectural Review process. Regulations pertaining to regulated and designated trees are discussed further in Section 3.9, Biological Resources.

Impacts and Mitigation Measures

Standards of Significance

Based on significance thresholds determined by the City of Palo Alto, the SUMC Project would result in a significant visual quality impact if it would:

- Substantially degrade the existing visual character or quality of the site and its surroundings;
- Significantly alter public viewsheds or view corridors or scenic resources (such as trees, outcroppings or historic buildings along a scenic roadway);
- Require substantial terrain modifications that would degrade the visual character of the site;
- Allow for new development that would violate existing Comprehensive Plan policies regarding visual resources;
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area; or
- Substantially shadow public open space (other than public streets and adjacent sidewalks) between 9:00 a.m. and 3:00 p.m. from September 21 to March 21.

The potential for the SUMC Project to violate existing Comprehensive Plan policies regarding visual resources is addressed in Section 3.2, Land Use. As such, this criterion is not addressed in this section because doing so would be duplicative. Also, it should be noted that, while visual impacts from landscaping alterations are discussed in this section, the more specific issue regarding loss of Protected Trees, as defined under the City of Palo Alto's Tree Preservation and Management Regulations, is addressed in Section 3.9, Biological Resources.

Methodology for Analysis

Significance determinations for the impact analysis are based on the extent of changes in the visual character and quality of the SUMC Sites and surroundings, as well as the change in quality of views from key vantage points. Changes in visual character are affected primarily by building scale, height, and mass. Landscaping, lighting, exterior architectural treatments, and materials are also considered in determining the resulting character and its compatibility with surrounding development. Context and expectations are also considered. As designed, if the ARB cannot make the necessary findings for approval, or if the design is contrary to the policies of the Comprehensive Plan, it would create a significant adverse effect. Similarly, if the scale, height, and mass of the proposed buildings would substantially degrade existing views from key vantage points, such as roadways that are protected under the Comprehensive Plan and other sensitive viewer locations, then a significant adverse effect would result.[16] A change in views is considered adverse if the resulting development pattern demonstrably contravenes the vision for the City that is expressed in the Comprehensive Plan.

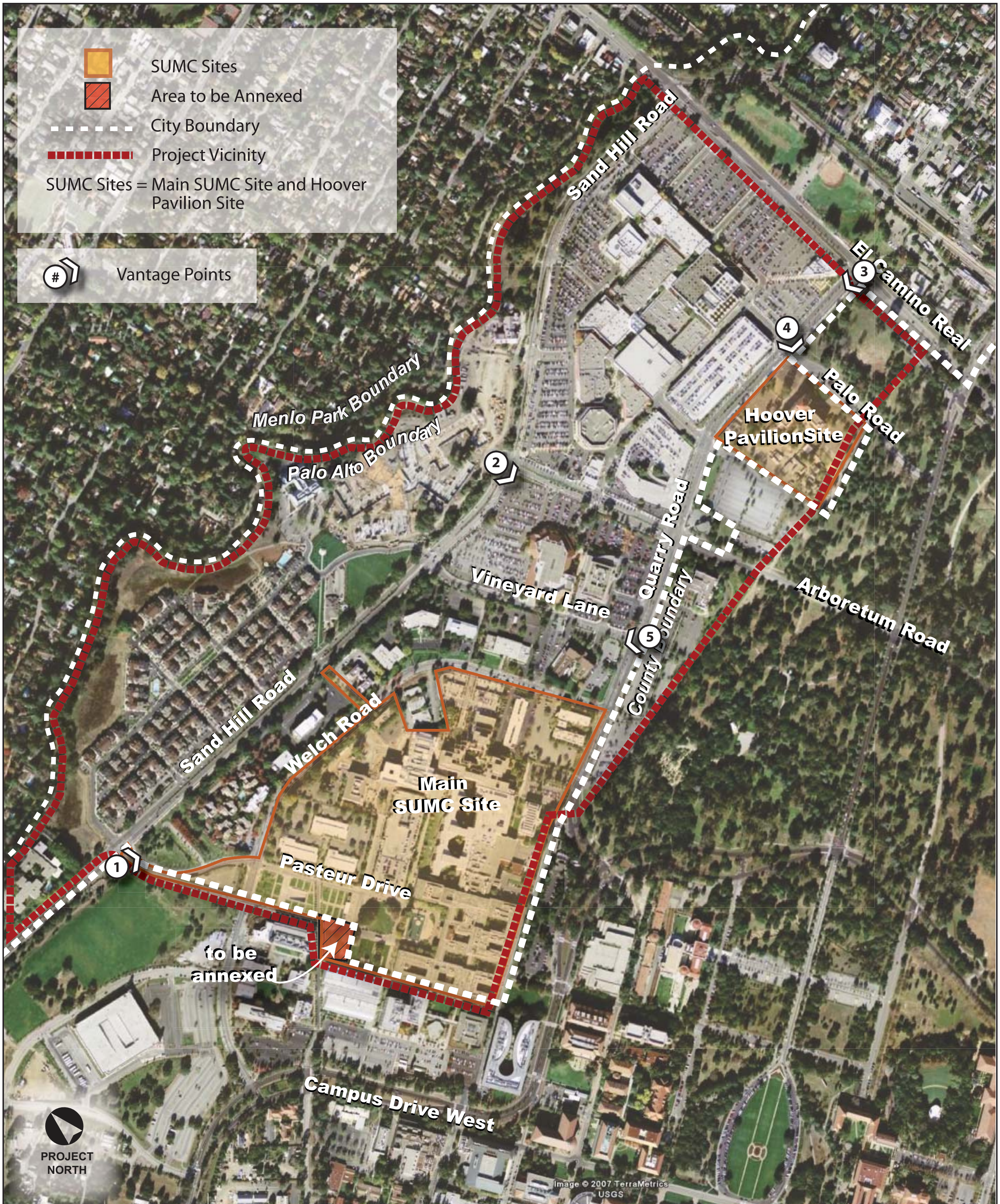
To demonstrate potential impacts from the SUMC Project, visual simulations of the proposed construction were prepared by William Kanemoto and Associates. The visual simulations provide existing and representative post-construction (2025) views from five selected vantage points. The simulations for the SUMC Project are a representation of final design. Selection of the five vantage points was based on the previously identified viewer locations or roadways, and on vantage points that were identified during the scoping process of the SUMC Project as areas of concern, such as areas where a large number of viewers could occur. Figure 3.3-7 provides a map of the five vantage points from which visual simulations are depicted. The vantage points depict views from the following locations:

Vantage Point 1 – depicts views of the Main SUMC Site looking south from Sand Hill Road and Pasteur Drive

Vantage Point 2 – depicts views of the Main SUMC Site looking southwest from Sand Hill Road and Arboretum Road

Vantage Point 3 – depict views of the Hoover Pavilion Site looking west from El Camino Real and Quarry Road

[16] Note that building height and development compatibility issues are also discussed in Section 3.2, Land Use. The land use discussion considers the potential impacts of modifying the existing 50 foot height limit in the Comprehensive Plan.



Source: PBS&J, 2009.

PBS&J

FIGURE 3.3-7
Vantage Points

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Stanford University Medical Center Facilities Renewal and Replacement Draft EIR

Vantage Point 4 – depicts views of the Hoover Pavilion Site looking southwest from Quarry Road

Vantage Point 5 – depicts views of the Main SUMC Site (LPCH expansion) looking northwest from Quarry Road at Vineyard Lane

Environmental Analysis

VQ-1. Temporary Degradation of Visual Character During Construction. The SUMC Project would substantially degrade the existing visual character and quality of the SUMC Sites during construction. (S)

Main SUMC Site. The SUMC Project would substantially degrade the existing visual character and quality of the Main SUMC Site during construction. As discussed in Section 2, Project Description, construction on the Main SUMC Site is anticipated to take place over a 12-year period, with estimated completion in 2021 (although full utilization and occupancy would not occur until 2025). During the construction stage, there would be temporary but adverse visual impacts within the 56-acre site from the demolition of existing buildings, the assembly of new structures, and from equipment staging. The landscaped area along Pasteur Drive would be used to temporarily house equipment and building materials during the construction process.

Moreover, aside from the conditions above, there would be periods where both existing and new buildings would be erect and operable, creating a crowded appearance that could be overwhelming in comparison to existing conditions. For example, at the 2015 point of development, the new SHC Hospital building, the LPCH Hospital expansion and clinic, and FIM 1 would tentatively be completed. However, most of the 1959 Hospital Building complex also would still be erect. Because a number of the existing buildings would remain standing and many new structures would be completed at this intermediate stage of construction, net building massing (existing plus new massing) would exceed both existing and final buildout conditions. The resulting crowded appearance would contribute to the substantial degradation of visual conditions at the Main SUMC Site during construction.

Hoover Pavilion Site. Construction at the Hoover Pavilion Site is anticipated to last three years, estimated from 2010 to 2012. There would also be temporary adverse visual impacts resulting from the demolition of existing sheds, the assembly of new structures, and from equipment staging. Construction on the Hoover Pavilion Site would be less intensive and would be completed sooner than construction at the Main SUMC Site; however, it temporarily would result in substantially degraded visual conditions at this site, amidst the distinctive Hoover Pavilion, and along the heavily traveled Quarry Road. Impacts would be temporary but significant.

MITIGATION MEASURE. Mitigation Measure VQ-1.1, below, would reduce visual impacts during construction to less than significant. (LTS)

VQ-1.1 *Implement Construction Visual Improvements Plan.* The SUMC Project sponsors shall develop and implement a Construction Visual Improvements Plan that would make visual improvements to construction zones within a given construction phase and between phases if the zone is not scheduled for construction activity or would remain unused for a period greater than six months. Construction zones subject to this mitigation measure shall be defined by the Planning Director, and shall consider the size of the area, the nature and timing of the construction activity, and the proximity or visibility of the area to public vantage points or residential uses. The Construction Visual Improvements Plan shall be implemented by the project contractor(s) and must be approved by the Planning Director. The intent of the plan is to aesthetically improve portions of the project site that would remain unimproved for an extended period and screen the construction zone from view by passersby along the public streets and sidewalks. Possible improvements in the plan include, but are not limited to, the following:

a. The SUMC Project sponsors shall conceal staging areas with fencing material to be approved by the Planning Director prior to commencement of use of the staging area for construction equipment and vehicles.

b. The SUMC Project sponsors shall frequently remove construction debris and refuse from the SUMC Sites.

c. The SUMC Project sponsors shall install all landscaping as early as feasible to decrease visual impacts of construction. Existing landscaping within the SUMC Sites that would not be removed by the construction shall be maintained.

VQ-2. Permanent Degradation of Visual Character Post Construction. The SUMC Project would have a significant impact pertaining to degradation of the existing visual character or quality of the SUMC Sites and their surroundings. (S)

Ongoing Project Design. As required by Municipal Code Sections 2.21 and 18.76.020(b), the SUMC Project has undergone preliminary Architectural Review and project plans are currently being considered by the ARB. While the below analysis addresses the site plans presented in the SUMC Application, as described in Section 2, Project Description, project design is still in progress and could continue to be altered.

Design Goals. As discussed in Section 3.2, Land Use, design goals have been identified by the SUMC Project sponsors as the primary design goals of the SUMC Project. These goals include:[17]

- Reinforcement of the City character and structure.
- Establishment of a unified identity for the SUMC while maintaining the distinctiveness of the individual institutions.

[17] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 4.

- Promoting a sense of security through attentiveness to personal and public safety.
- Providing a sense of welcome to the broad community of SUMC users.
- Planning for sustainability by accommodating all travel modes (beyond walkability) and enhancing access to transit.
- Designing for efficiency in the utilization of land and other resources.
- Planning for the flexibility necessary to adapt to the dynamic nature of research universities and urban infrastructure technologies.

Draft Design Guidelines. The SUMC Project sponsors have prepared and submitted draft Design Guidelines for the SUMC Project. While these draft Design Guidelines are described here, it should be noted that the guidelines are preliminary and are still in the process of being finalized. Final design approval is required before any development can proceed.

The SUMC draft Design Guidelines[18] provide a basis for better understanding the architectural implications of the proposed developments within the SUMC Sites. The intent of the guidelines is to allow for a variety of architectural expressions while promoting a cohesive campus environment. The guidelines discuss three basic factors: site design, building design, and connective elements.

- **Site Design.** The site design concept for the SUMC Project builds upon existing patterns of pedestrian and vehicular circulation, and parking. In addition, open spaces would serve to physically connect the SUMC to the public perimeter, as well as to connect the SUMC visually to the current Stanford landscape. The tree-lined streets, pathways, and open spaces, which would also serve as connectors, would alter buildings frontages to encourage both community and individuality.
- **Building Design.** The proposed building designs would serve to redefine the architectural image and spatial character of the medical campus, while blending with the existing buildings and landscape. The intent of the Design Guidelines is to allow a variety of architectural expressions for each institution, while promoting a cohesive campus image. The pattern of buildings, footprints, heights, and material palette of the new development would be balanced by major and minor open spaces, and existing buildings along the Welch Road Corridor and the academic side of campus. Building massing techniques would be used to mitigate scale, encourage pedestrian way-finding, and enhance the overall character of the SUMC Sites.

18 Stanford University Medical Center, *Stanford University Medical Center Campus Design Guidelines, Draft,* June 12, 2008.

- **Connective Elements.** Connective elements would also be applied at the SUMC Sites to provide physical and visual linkages between buildings and open space to form a cohesive campus environment. Connective elements include: consistent use of specific paving materials; the placement of new planting schemes; lighting; signage; shared amenities (for example, bus shelters, benches, and public art); and utilities and infrastructure.

The draft Design Guidelines also include landscaping elements in order to create visual continuity in open spaces between the SUMC Sites and the Stanford campus. The campus would include approved tree species and their typical planting patterns to serve campus cohesiveness. The SUMC Sites would include landscaping such as the naturalistic Arboretum with native oak trees; formal open space to create nodes of interest and connectors; lawns with manicured grass; interior courtyards and gardens; and street tress that would line the streets and major pathways.

The draft Design Guidelines are being reviewed by the ARB and would be part of the entitlements considered by the City Council and would continuously serve to guide development into the future.

Impacts on On-Site Character. In spite of the above goals and Design Guidelines, the SUMC Project would increase on-site massing by adding 1.3 million square feet of building floor area and raising maximum building height on the SUMC Sites from five to seven stories, reconfigure on-site layout, alter on-site landscaping and lighting, and incorporate new building materials and treatments. These changes are described in the subsequent paragraphs. Although the SUMC Project would generally retain the institutional character of the SUMC Sites, particularly considering the size and increased building mass of the SUMC Project, the SUMC Project would result in a significant impact on on-site character because adverse visual effects could occur if the more detailed design elements were not addressed appropriately or if the overall design were to change substantially. However, the SUMC Project continues to be reviewed by the ARB to refine and modify the SUMC Project, towards the findings that must be made.

Building Mass, Height, and Layout. At the Main SUMC Site, maximum on-site building height at the Main SUMC Site would increase from about 50 feet to 130 feet (without rooftop appurtenances). This maximum building height would exceed current building height limits within the City. However, it should be noted that structures of comparable height currently exist within the surrounding areas. For example, City Hall is a 127-foot building and the Stanford University Hoover Tower, which is within Stanford University but outside the Project Vicinity, is a 285-foot structure. The existing Hoover Pavilion is 110 feet tall at the top of its rooftop appurtenance. Finally, structures adjacent to the Main SUMC Site (within Stanford University lands) reach a height of 88 feet.

Based on the vantage point map provided as Figure 3.3-7, those vantage points that depict the Main SUMC Site include Vantage Points 1, 2, and 5. Existing and post-construction views from these vantage points are provided in Figure 3.3-8 through Figure 3.3-10. On the eastern portion of the Main SUMC Site, the 701 and 703 Welch Road medical office/clinic buildings would be demolished and replaced with new wings of the LPCH, which would house expanded hospital space and clinics. As shown in Figure 3.3-8, Vantage Point 5, the LPCH expansion would increase bulk and massing at the corner of Welch Road and Quarry Road by replacing a cluster of small one- to three-story buildings with an articulated 85-foot-tall (without rooftop appurtenance) hospital structure. Existing landscaped open space at the corner of Welch Road and Quarry Road would be expanded as the building setback would increase. The LPCH expansion structure would be substantially taller than the existing LPCH complex (which would not be demolished). The existing LPCH is 46 feet tall without rooftop appurtenances,[19] and the expansion structure would be 85 feet tall, 39 feet taller.

Figure 3.3-9 and Figure 3.3-10 depict views of the Main SUMC Site from Vantage Points 1 and 2. On the northern portion of the Main SUMC Site, the small one-story buildings at 1101 Welch Road, the two-story Parking Structure 3, and the distinctive 1959 Hospital Building complex along Pasteur Drive would be demolished. In place of these structures, a series of modules with broken massing would be constructed. The proposed series of modules is depicted in Figure 3.3-9, which shows the modules from Pasteur Drive and Sand Hill Road. This series of modules would range from 40 feet to 130 feet in height. There would be five 130-foot-tall modules along the east side of Pasteur drive and one 64-foot-tall module at the center/median of Pasteur Drive. Some open space at the center and east side of Pasteur Drive would be replaced by the modules. A surface parking lot and landscaped open space would be incorporated between the replacement hospital and the 1100 Welch Road Apartments.

At the current location of the 1959 Hospital Building complex, there would be four modules that would reach 64 to 112 feet in height; these modules would house new clinic/medical office space. There would also be new, expansive landscaped open space at the terminus of Pasteur Drive. Along the west side of Pasteur Drive, three 66-foot-tall FIM buildings would replace portions of the 1959 Hospital Building complex and existing open space. The FIM buildings would be spaced apart so that landscaped open space would be incorporated between each building.

Without implementation of the City's Architectural Review process to ensure appropriate design of proposed structures, this increase in massing would have a significant impact on the existing character of the Main SUMC Site and its surroundings.

[19] With rooftop appurtenances, the existing LPCH is about 63 feet tall.

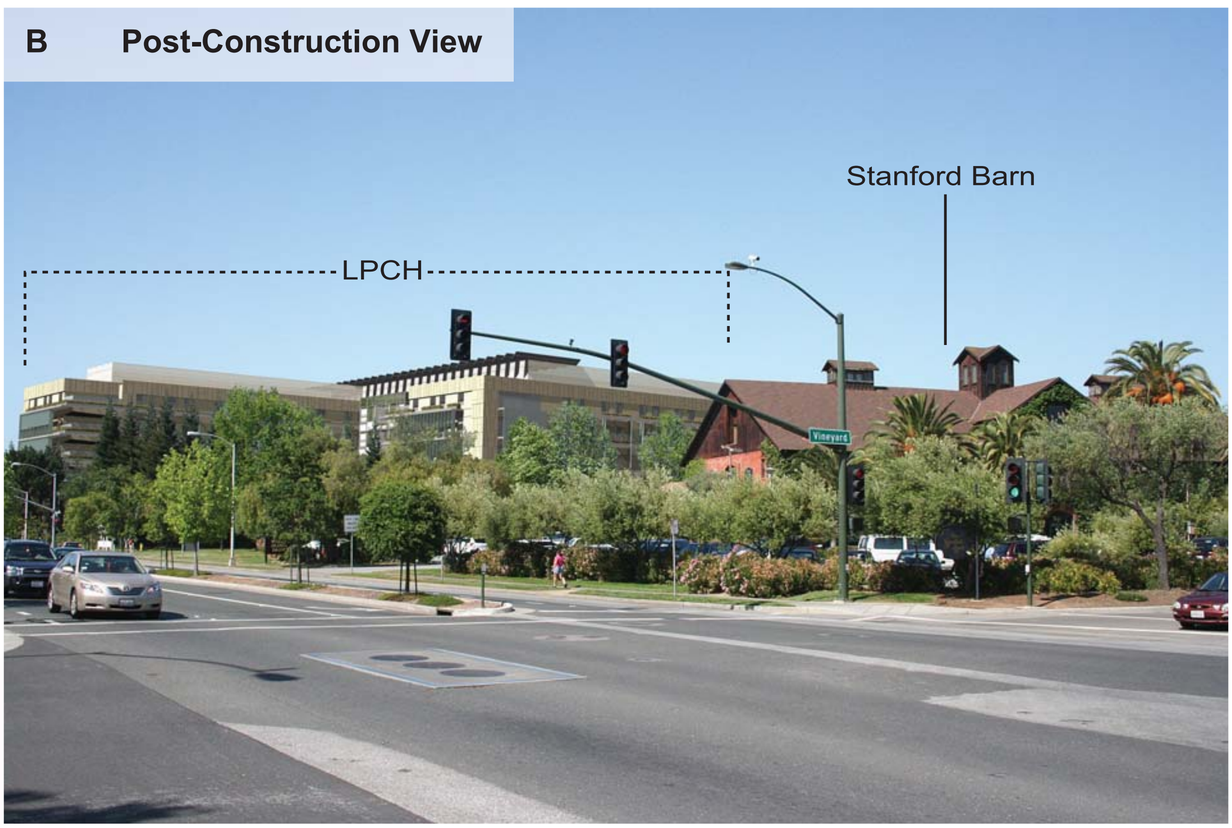


FIGURE 3.3-8
View of LPCH, Looking Northwest from Quarry Road and Vineyard Lane (Vantage Point 5)

***Source*: William Kanemoto & Associates, 2009.**

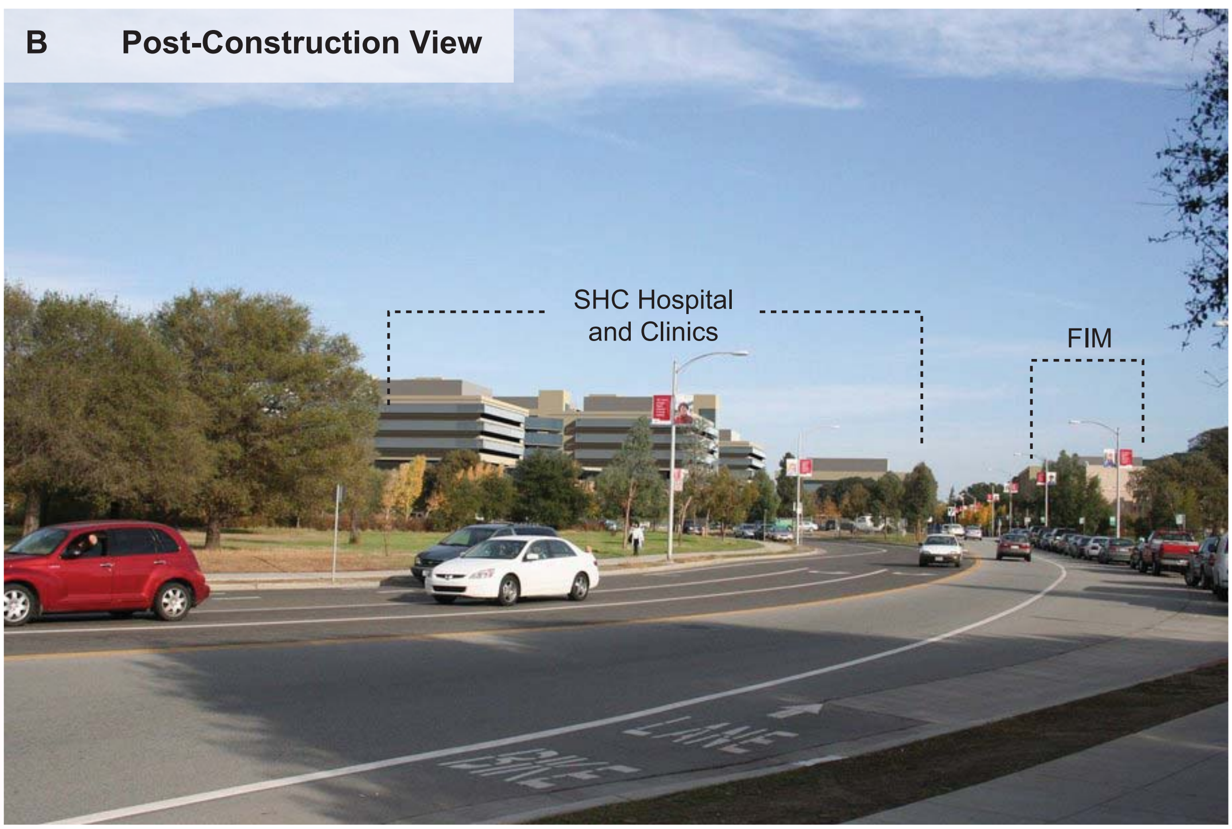


FIGURE 3.3-9

Source: William Kanemoto & Associates, 2009.

View of Replacement SHC Hospital, Looking South from Sand Hill Road and Pasteur Drive (Vantage Point 1)

FIGURE 3.3-10

Source: William Kanemoto & Associates, 2009.

View of LPCH and SHC Module, Looking Southwest from Sand Hill Road and Arboretum Road (Vantage Point 2)

Based on the vantage point map provided as Figure 3.3-7, those vantage points that depict the Hoover Pavilion Site include Vantage Points 3 and 4. Existing and post-construction views from these vantage points are provided in Figure 3.3-11 and Figure 3.3-12. A 60-foot-tall medical office/clinic building would be constructed on the north side of the distinctive Hoover Pavilion and a 60-foot-tall garage would be constructed on the west side of the Hoover Pavilion. These proposed structures would be shorter than the Hoover Pavilion, which is 65 feet tall without rooftop appurtenances and 110 feet tall to the highest point of the rooftop appurtenance. The medical office building would be sited between Quarry Road and the Hoover Pavilion and would partially obstruct views of the Hoover Pavilion from Quarry Road. As shown in Figure 3.3-11, much of the east side of the Hoover Pavilion would remain unobstructed from Quarry Road. As shown in Figure 3.3-12, much of the landscaped open space between the Hoover Pavilion and Quarry Road would be retained. (See Section 3.8, Cultural Resources, for a discussion of the impacts of the medical office building on the historic integrity of the Hoover Pavilion.) Nonetheless, the SUMC Project would substantially increase building mass at the Hoover Pavilion Site.

Without implementation of the City's Architectural Review process to ensure appropriate design of proposed structures, this increase in massing would have a significant impact on the existing character of the Hoover Pavilion Site and its surroundings.

Landscaping. Overall, the SUMC Project would decrease landscaped area on the ground by about 1 acre, but would increase landscaped rooftops by about 6 acres. Approximately 1,562 trees, including native and non-native ornamental species have been identified in the SUMC Sites.[20] There would be removal of mature trees on both SUMC Sites, including a total 71 Protected Trees, which is discussed in more detail in Section 3.9, Biological Resources. This Visual Quality section addresses changes in landscaping overall, and Section 3.9, Biological Resources, specifically addresses loss of Protected Trees.

At the Main SUMC Site, the SUMC Project would redistribute landscaped open space and remove many large, mature trees on site. The proposed site plan would increase landscaped open space at (1) the intersection of Welch Road and Quarry Road, next to the LPCH expansion structure; (2) at the terminus of Pasteur Drive, where the 1959 Hospital Building complex is currently located; (3) at the west side of Pasteur Drive, between the proposed FIM buildings; and (4) at the intersection of Pasteur Drive and Welch Road, between the replacement hospital and 1100 Welch Road residences. The SUMC Project would eliminate landscaped open space at the Pasteur Drive median. It is expected that new pedestrian amenities would be installed at new open space and walkway locations. The Main SUMC Site is a medical campus and by function is pedestrian oriented, providing walkways, manicured lawns, benches, fountains, art sculptures, and pathway lighting. The proposed site plan is expected to maintain its pedestrian orientation pursuant to its design guidelines. As

20 Ray Morneau, Certified Arborist, *Certified Arborist's Tree Inventory for Stanford Medical Center Area Project*, September 2007.

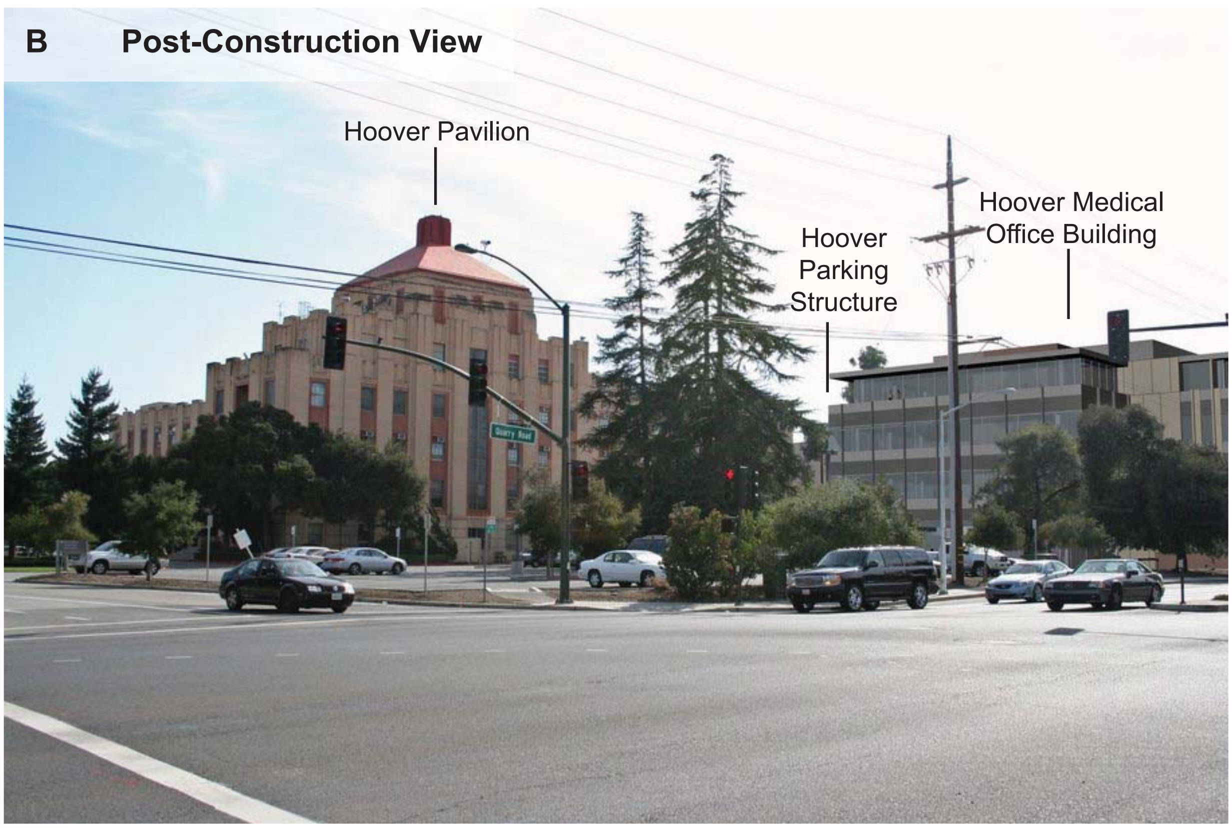


FIGURE 3.3-11
View of Hoover Pavilion Site, Looking West from Quarry Road and Palo Road (Vantage Point 4)

Source**:** William Kanemoto & Associates, 2008.

Source: William Kanemoto & Associates, 2008.

PBSJ

FIGURE 3.3-12

View of the Hoover Pavilion Site, Looking West from El Camino Real and Quarry Road (Vantage Point 3)

demonstrated by Figure 3.3-9, the landscaping changes would not be apparent from the Sand Hill Road scenic route.

The redistribution of on-site open space and the alternation and/or removal of visually distinctive landscaped areas could adversely change the visual character of the SUMC Site. Although the SUMC Project would increase landscaped open space at certain areas, as described above, the reconfiguration of existing open spaces would result in the loss of visually significant landscaping elements, including a number of mature trees. The gardens and open spaces on the Main SUMC Site contribute to the overall visual character and alternation of existing landscaping and visual amenities could therefore result in a significant change of the existing visual character.

At the Hoover Pavilion Site, construction of the medical office/clinic building and parking garage would require removal of mature trees and reduction of landscaped area at the site. Replacement of some trees by structures would be visible from Quarry Road (see Figure 3.3-11), although most existing trees that are visible from Quarry Road would be maintained. Quarry Road is not a scenic route under the Comprehensive Plan. As shown in Figure 3.3-12, much of the landscaped open space between the Hoover Pavilion and Quarry Road would be retained, resulting in a less-than-significant impact to the existing visual quality at the Hoover Pavilion Site.

Lighting. Additional reflective surfaces and exterior lighting features would be installed at the SUMC Sites. The SUMC Project would be subject to Section 18.23.030 of the City of Palo Alto Municipal Code, which would preclude facades with glazed and/or reflective materials and significant glare and off-site light spillage. In addition, a lighting plan for all exterior lighting under the SUMC Project would be developed per Section 18.23.030. However, without Architectural Review of the building facades and the lighting plan, reflective surfaces and exterior lighting could result in a significant impact. Refer to Impact VQ-5 for a more detailed discussion about lighting impacts.

Exterior Building Treatments. As described under Existing Conditions, building treatments at the SUMC Sites vary and include glass and steel, terracotta, Art Deco, modern-style, and ornate concrete screen treatments. The two most architecturally distinctive structures at the SUMC Sites are the Hoover Pavilion and the 1959 Hospital Building complex. The SUMC Project would alter existing exterior treatments on-site, particularly by demolishing the distinctive 1959 Hospital Building complex and constructing new buildings. The exterior treatments of the new buildings would differ from those of existing surrounding buildings and buildings to be retained; the new treatments could result in adverse impacts. New exterior treatments under the SUMC Project are depicted in Figure 3.3-8 through Figure 3.3-12.

The 65-foot-tall Art Deco Hoover Pavilion (110 feet tall to the top of the rooftop appurtenance) is the defining feature of the Hoover Pavilion Site and is a distinct element of the SUMC Sites' existing visual character. The SUMC Project would internally renovate the Hoover Pavilion and would not demolish it. Window replacement associated with the renovation would not substantially alter the Hoover Pavilion exterior because windows would be replaced in accordance with Secretary of the Interior Standards for Rehabilitation of Historic Structures (see Section 3.8, Cultural Resources, for more information), and thus the replacement would retain the historic appearance of the structure.

MITIGATION MEASURE. Mitigation Measure VQ-2.1, below, requires and ensures compliance with ARB recommendations for final design. Such compliance would ensure that impacts on on-site visual character and quality would be less than significant because the ARB's recommendations, through the Architectural Review process, would address massing, layout, landscaping, and architectural design impacts from the SUMC Project, as described further below.

Architectural Review of Mass and Layout. Based on the SUMC Project design guidelines, the Architectural Review would consider, among other factors, whether the SUMC Project has a coherent composition and whether its bulk and mass are harmonious with surrounding development. The ARB's recommendations regarding these factors will be forwarded to the City Council for consideration. The City Council would then review the recommendations and make findings, as appropriate, that, among other factors, the design promotes harmonious transitions in scale and character in areas between different designated land uses; the planning and siting of the various functions and buildings on the site create an internal sense of order and provide a desirable environment for occupants, visitors, and the general community; and the amount and arrangement of open space are appropriate to the design and the function of the structures.

Architectural Review of Landscaping. Based on the SUMC Project design guidelines, the Architectural Review would also consider whether the SUMC Project adequately incorporates landscaping. The ARB's recommendations regarding these factors will be forwarded to the City Council for consideration. The City Council would then review the recommendations and make findings, as appropriate, that the amount and arrangement of open space are appropriate to the design and the function of the structures, and the planning and siting of the various functions and buildings provide a desirable environment for occupants, visitors, and the general community.

Architectural Review of Exterior Building Treatment. The Architectural Review of the SUMC Project would also consider whether the SUMC Project incorporates quality materials, harmonious colors, appropriate ancillary features, and a cohesive design with a coherent composition. The ARB's recommendations regarding these factors will be forwarded to the City Council for consideration. The City Council would then review the recommendations and make findings, as appropriate, that the design is compatible with the immediate environment of the SUMC Sites, is appropriate to the function of the SUMC Project, promotes harmonious transitions in character in areas between different designated land uses, and is compatible with approved improvements both on and off the site. This Architectural Review process would ensure that the proposed structures would be compatible with buildings that will remain on the SUMC Sites and with surrounding development and natural features.

Thus, implementation of Mitigation Measure VQ-2.1 would reduce the significant impacts on on-site character to a less-than-significant level. (LTS)

VQ-2.1 *Adhere to City's Architectural Review Process and Recommendations.* The SUMC Project sponsors shall submit final building and site plans to the ARB prior to issuance of any development permits. Architectural Review shall assess the appropriateness of proposed demolitions, proposed building heights and massing, siting of buildings and structures, architecture and façade treatments, landscaping, circulation plans, and parking. The ARB may require alterations to any of the above project features, or the ARB may suggest new features, such as new landscaping or public art, to improve the proposed SUMC Project design. Any recommendations made by the ARB with respect to the design of the SUMC Project shall be implemented by the SUMC Project sponsors.

VQ-3. Alteration of Public Viewsheds, View Corridors, or Scenic Resources. The SUMC Project would result in significant impacts on views. (S)

As explained under Methodology for Analysis, a change in views is considered adverse if the resulting development pattern demonstrably contravenes the vision for the City that is expressed in the Comprehensive Plan. As such, this analysis considers impacts of the SUMC Project on views of visual resources that are protected under the Comprehensive Plan, including the foothills of the Santa Cruz Mountains, the East Bay hills, and the El Camino Real Gateway. These resources are protected under Policies L-3, L-69, L-71, and Program L-71 of the Comprehensive Plan. Policy L-3 states that the City should "guide development to respect views of the foothills." Policy L-69 and Program L-71 of the Comprehensive Plan seek to preserve the scenic qualities of Palo Alto roads and recognize Sand Hill Road as a scenic route. Also, this analysis considers views of the above resources from the perspective of key vantage points, which include those sensitive viewer locations listed earlier in this section, under Viewsheds and View Corridors. These sensitive viewer locations include the Sand Hill Road scenic route, other public streets (Quarry Road [including its El Camino Real intersection], a portion of Pasteur Drive, and Welch Road), and nearby residences (including those at 1100 Welch Road and the Stanford West Apartments). As described earlier in this section, these locations represent views from which the SUMC Project would most be visible and as such represent the worst-case impacts on views.

Lastly, because Policy L-69 and Program L-71 of the Comprehensive Plan seek to preserve the scenic qualities of Palo Alto roads and recognize Sand Hill Road as a scenic route, the impacts of the SUMC Project on the overall visual quality of Sand Hill Road is also addressed here.

Views from Sand Hill Road. Impacts on views from the Sand Hill Road scenic route are divided into the western and eastern segments of this roadway. As explained below, the SUMC Project would have a significant impact on views from Sand Hill Road.

Western Segment of Sand Hill Road. As described under Viewsheds and View Corridors, the western segment of Sand Hill Road runs between I-280 and Santa Cruz Avenue. Views of the East Bay hills can be seen from Sand Hill Road near Santa Cruz Avenue. The views of the East Bay hills are partially obstructed by existing taller structures, including the Stanford University 285-foot-tall Hoover Tower (within Stanford University and outside the Project Vicinity), the 110-foot-tall rooftop appurtenance of the Hoover Pavilion, and taller office structures near Downtown Palo Alto, such as City Hall, a 127-foot structure. Thus, it is likely that the 130-foot-tall replacement SHC Hospital modules would also be visible and would partially obstruct views of the East Bay hills. The resulting views from the Sand Hill Road scenic route would be significant if the SUMC Project were not addressed properly through the City's Architectural Review process.

Eastern Segment of Sand Hill Road. As described under Viewsheds and View Corridors, the eastern segment of Sand Hill Road runs between Santa Cruz Avenue and El Camino Real. Impacts of the SUMC Project on views from this portion of Sand Hill Road are depicted through Vantage Points 1 and 2, per Figure 3.3-7. The existing and resulting views are illustrated in Figure 3.3-9 and Figure 3.3-10.

Buildings and landscaping between Sand Hill Road and Welch Road largely obstruct views of the Main SUMC Site from Sand Hill Road. Direct views of the Main SUMC Site from Sand Hill Road can only be seen from its intersection with Pasteur Drive. Figure 3.3-9 illustrates the existing and resulting view from this intersection. The hospital modules would be visible in the middle ground, resulting in visibly intensified development. The line of sight from the Pasteur Drive entrance towards the new SHC modules does not face the direction of the foothills and thus no views of the foothills or the East Bay hills would be obstructed.

Figure 3.3-10 shows the existing and resulting view facing southwest from Sand Hill Road and Arboretum Road. There are minimal background views of the foothills from this vantage point; the foothills are mostly obstructed by existing landscaping and retail buildings. Both the LPCH structure and SHC modules would be partially visible from Sand Hill Road and Arboretum Road. As shown in Figure 3.3-10 (Vantage Point 2), the 130-foot-tall SHC modules and the 85-foot-tall LPCH structure would be largely obstructed by vegetation and intervening structures. The structures would further obstruct views the foothills. The resulting views obstruction of the foothills would be significant if the SUMC Project were not addressed properly through the City's Architectural Review process.

In terms of the resulting changes to the overall visual character of Sand Hill Road, the SUMC Project would alter some intermittent views along this road but would not substantially alter its character and visual quality. The Main SUMC Site is separated from Sand Hill Road by properties along Welch Road and the only direct views of the Main SUMC Site are at the Pasteur Drive/Sand Hill Road intersection. As stated in Program L-71 of the Comprehensive Plan, "This scenic route is characterized by its broad setbacks and rural, oak-dominated landscaping." The SUMC Project would not disturb the broad setbacks and rural, oak-dominated landscaping that characterize this route.

Views from Other Public Streets. As stated previously, this analysis addresses changes in views from Quarry Road (including its El Camino Real intersection), a portion of Pasteur Drive, and Welch Road. As explained below, the SUMC Project would have a significant impact on views from public streets, particularly from Quarry Road.

Quarry Road. Impacts of the SUMC Project on views from Quarry Road are depicted through Vantage Points 3, 4, and 5, per Figure 3.3-7. The existing and resulting views are illustrated in Figure 3.3-12, Figure 3.3-11, and Figure 3.3-8, respectively. As shown in Figure 3.3-12 (Vantage Point 3), the foothills of the Santa Cruz Mountains are visible in the distance facing west from Quarry Road at El Camino Real. The proposed medical office building at the Hoover Pavilion Site would slightly obstruct views of the foothills on the south side of Quarry Road. The resulting views obstruction of the foothills would be significant if the SUMC Project were not addressed properly through the City's Architectural Review process.

As indicated in the Introduction to this section, public comments received during the NOP process include impacts on views of the Hoover Pavilion. While Hoover Pavilion is a visually distinctive structure in the Project Vicinity, it is not a visually protected resource under the Comprehensive Plan and obstruction of this building would not comprise a significant visual quality impact. (However, it is treated in Section 3.8, Cultural Resources, as a significant historic resource and a substantial obstruction of this resource would be a significant cultural resource impact. See Section 3.8 for a discussion of impacts from a cultural resource perspective). Nonetheless, Figure 3.3-11 (Vantage Point 4) shows that most of the Hoover Pavilion, including its frontage, would still be visible from Quarry Road even after construction of the proposed medical office building.

As shown in Figure 3.3-8 (Vantage Point 5), the 85-foot-tall LPCH expansion structure would be prominently visible from Quarry Road at Vineyard Lane. This portion of Quarry Road features distant but panoramic views of the foothills of the Santa Cruz Mountains facing west. Currently, the Stanford Barn and dense vegetation obstruct views of the foothills looking roughly northwest from this intersection. The addition of the LPCH structure would increase building mass from this perspective, but would not obstruct foothill views facing northwest.

Public Portion of Pasteur Drive. Pasteur Drive is a public street from Sand Hill Road to Blake Wilbur Drive. Facing west, this street features views of the foothills of the Santa Cruz Mountains. Along the west side of Pasteur Drive, three 66-foot-tall FIM buildings would replace portions of the 1959 Hospital Building complex and existing open space. However, these structures would mostly be along the private portion of Pasteur Drive, with the exception of a portion of FIM 1. From street level, views of the foothills are obstructed by the Center for Clinical Sciences Research. As such, construction of FIM 1 would not result in new obstruction of foothills from the public portion of Pasteur Drive.

Welch Road. Facing west from Welch Road near Pasteur Drive, views of the foothills of the Santa Cruz Mountains are largely obstructed by intervening trees and buildings. As such, while the SHC modules would be constructed near Welch Road, no substantial obstruction of the foothills would result as viewed from this roadway. Near the LPCH, existing structures such as the LPCH obstruct views of the foothills. As such, construction of the LPCH structures would not further obstruct the foothills.

Views from Other Vantage Points. Nearby residences, including those at 1100 Welch Road and the Stanford West Apartments, have been determined to be visually sensitive. The Stanford West Apartments on Sand Hill Road are roughly 500 feet from the Main SUMC Site, and the 1100 Welch Road Apartments are roughly 200 feet from the Main SUMC Sites. There are no significant views of foothills from common open spaces within the Stanford West Apartments or 1100 Welch Road Apartments. As such, the SUMC Project would not obstruct views of foothills from these locations.

While views from the above vantage points are specifically addressed in this analysis, the City acknowledges that views from a larger geographic context may be affected, especially by the proposed 130-foot-tall replacement SHC modules. As described under Existing Conditions, elevation in the City generally decreases from I-280 towards US 101 and the Bay, and such topography provides opportunity for views of distant hills or tall structures. On clear days, various locations identified as visually sensitive in the Comprehensive Plan would feature views of the foothills of the Santa Cruz Mountains to the west and the foothills of the East Bay hills to the east. Proposed structures could obstruct views of these foothills from other vantage points that are within the line of sight of the SUMC Sites. However, the above sensitive vantage points are those from where the SUMC Project would most be seen, and as such the maximum impact is captured through the above discussion.

Given these points, the SUMC Project's potential to alter public viewsheds, view corridors, and views from the Sand Hill Road scenic route would be significant if the SUMC Project were not addressed properly through the City's Architectural Review process.

MITIGATION MEASURE. Mitigation Measure VQ-2.1, above, requires and ensures compliance with ARB recommendations for final design and would reduce impacts on views from the proposed buildings under the SUMC Project. The Architectural Review of the SUMC Project would consider, among other factors, whether the SUMC Project has a coherent composition and that its bulk and mass are harmonious with surrounding development. The ARB's recommendations regarding these factors will be forwarded to the City Council for consideration. The City Council would then review the recommendations and make findings, as appropriate, that natural features are appropriately preserved and integrated with the SUMC Project; the design promotes harmonious transitions in scale and character in areas between different designated land uses; and the planning and siting of the various functions and buildings on the site create an internal sense of order and provide a desirable environment for occupants, visitors, and the general community. Implementation of Mitigation Measure VQ-2.1 regarding the Architectural Review process would ensure that impacts on views would be less than significant. (LTS)

VQ-4. Terrain Modifications. The SUMC Project would not require substantial terrain modifications that would degrade the visual character of the SUMC Sites. (NI)

The SUMC Sites are currently developed and are relatively flat. No substantial terrain modifications would be required for development of the SUMC Project, which would generally maintain on-site topography. As such, no impact would result.

VQ-5. New Sources of Light and Glare. The SUMC Project could increase light and glare nuisance from exterior lighting, resulting in a significant impact. (S)

Reflective Surfaces. Incorporation of new materials could include reflective surfaces that could emit glare and serves as a nuisance or hazard in surrounding uses and roads. Pursuant to Section 18.23.030 of the Municipal Code, facades with glazed and/or reflective materials are not allowed on buildings that face residential areas. However, without Architectural Review of the building facades to ensure that appropriate surfaces are incorporated, reflective surfaces could result in a significant impact.

Exterior Lighting. Additional exterior lighting features would be installed at the SUMC Sites. The SUMC Project would be subject to Section 18.23.030 of the City of Palo Alto Municipal Code, which would preclude significant glare and off-site light spillage. A lighting plan for all exterior lighting under the SUMC Project would be developed per Section 18.23.030; however, without Architectural Review of the lighting plan to ensure appropriate levels of illumination, exterior lighting could result in a significant impact.

Light and Glare from Emergency Vehicles. Currently, there are three major ambulance access routes to and from the SHC Emergency Department: trips from the east (generally from El Camino Real) travel along Quarry Road and trips from the west (generally from I-280) travel along Sand Hill Road onto Pasteur Drive and then onto Welch Road. Sensitive viewers who potentially see ambulance lights at night are located at the Stanford West Apartments on Sand Hill Road (west of Pasteur Drive) and at the 1100 Welch Road Apartments on the corner of Welch Road and Pasteur Drive.

Under the SUMC Project, Durand Way would be extended between Sand Hill Road and Welch Road to provide a new route for ambulances coming from El Camino Real. The new Emergency Department would be off Welch Road and all ambulance trips would converge along Welch Road. As a result, ambulance lights are seen and would continue to be seen from residential uses along Sand Hill Road east of Pasteur Drive. These uses include the Ronald McDonald House and assisted care housing. However, the uses along Sand Hill Road are set back from the road and any ambulance lights would be momentary and intermittent. Vegetation along the street frontage would also help obstruct glare from ambulance lights. As such, impacts on residents along Sand Hill Road would be less than significant.

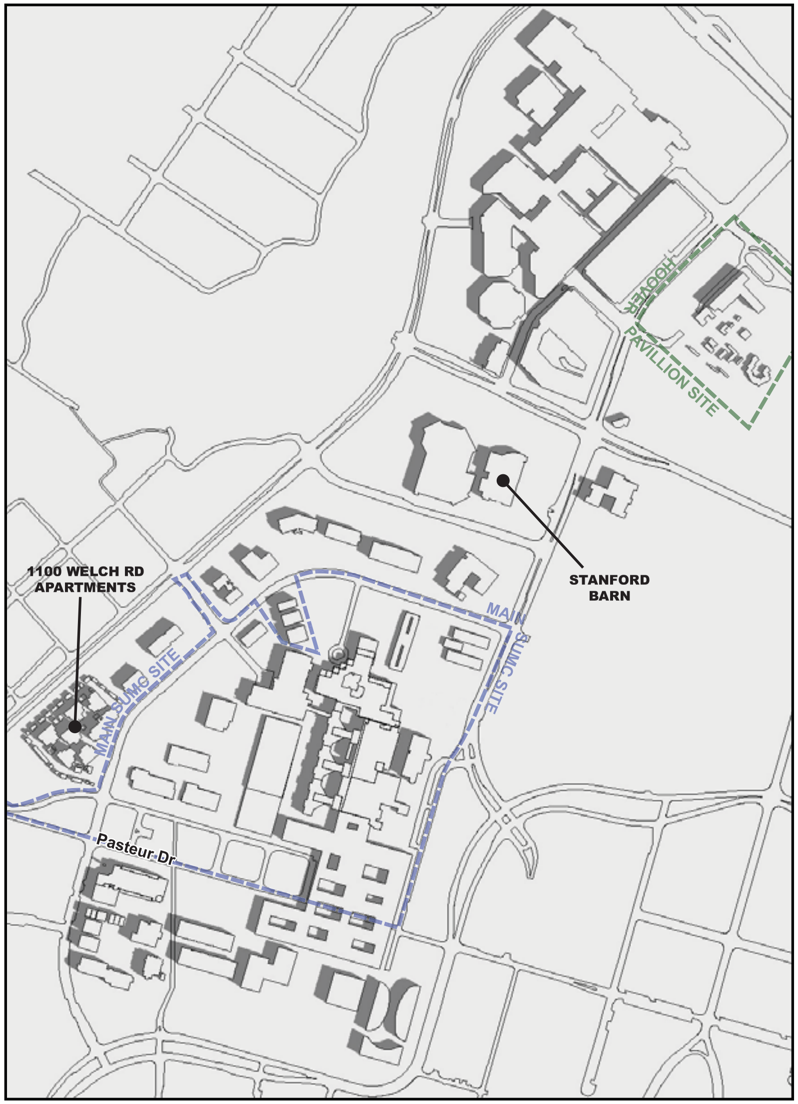
The residential apartments at 1100 Welch Road are already adjacent to an existing ambulance routes. The SUMC Project would increase daily ambulance trips from 23 to 39. This increase would be experienced by residents at 1100 Welch Road; however, this increase in potential exposure to ambulance glare would be less than significant because (1) this is one of three ambulance routes; therefore a fraction of the increase in ambulance trips would occur at this location; (2) not all ambulance trips involve use of lights; (3) not all ambulance trips occur at night; (4) ambulance lights would be momentary and intermittent; (5) existing landscaping obstructs street-level ambulance glare from residential uses; and (6) the common open spaces (i.e., pool area, lawns, courtyards) within the apartment complex are sufficiently distant from the ambulance route so that ambulance lights would not be seen.

MITIGATION MEASURE. Mitigation Measure VQ-2.1, above, requires compliance with ARB recommendations for final design and would reduce light and glare impacts from the proposed buildings under the SUMC Project. The Architectural Review of the SUMC Project would consider, among other factors, whether the SUMC Project incorporates quality materials, harmonious colors, appropriate ancillary features, a cohesive design with a coherent composition, and an appropriate lighting plan. The ARB's recommendations regarding these factors will be forwarded to the City Council for consideration. The City Council would then review the recommendations and make findings, as appropriate, that the design is compatible with the immediate environment of the SUMC Sites; is appropriate to the function of the SUMC Project; promotes harmonious transitions in character in areas between different designated land uses; and is compatible with approved improvements both on and off the site. This Architectural Review process would ensure that exterior treatment would not emit substantial glare and that exterior lighting impacts would be less than significant. (LTS)

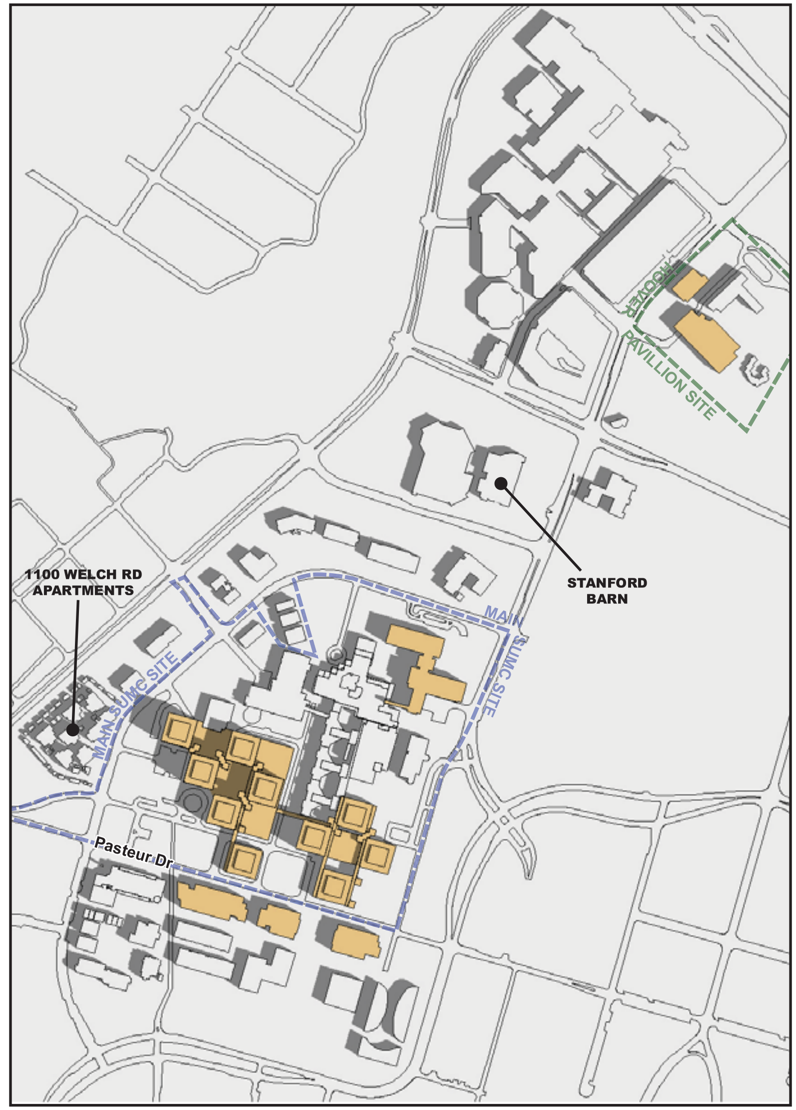
VQ-6. Shadowing of Public Open Space. The SUMC Project would not substantially shadow public open space (other than public streets and adjacent sidewalks) between 9:00 a.m. and 3:00 p.m. from September 21 to March 21. (LTS)

Recreational fields, trails, plazas, and courtyards within the Project Vicinity and adjacent Stanford University campus are considered to be private open spaces. Nevertheless, the shadows that would be cast on these open spaces within the campus are addressed here. Existing and projected shadows at 9:00 a.m. are depicted in Figure 3.3-13 through Figure 3.3-15, and existing and projected shadows at 3:00 p.m. are depicted in Figure 3.3-16 through Figure 3.3-18. As explained in the below paragraphs, shadow impacts would be less than significant.

Morning Shadows. As shown in Figure 3.3-13 through Figure 3.3-15, especially on December 21, 9:00 a.m. shadows from the SHC modules and Hoover Pavilion structures would be cast on nearby properties. New shadows would not be cast on common open spaces at the 1100 Welch Road Apartments. New shadows would be cast on the private open spaces in the middle of Pasteur Drive, although this area is not a recreational field, trail, plaza, or courtyard. Fewer shadows would be cast at the terminus of Pasteur Drive, where there are walkways. The Hoover Pavilion Site medical office building would cast a new shadow onto



Existing

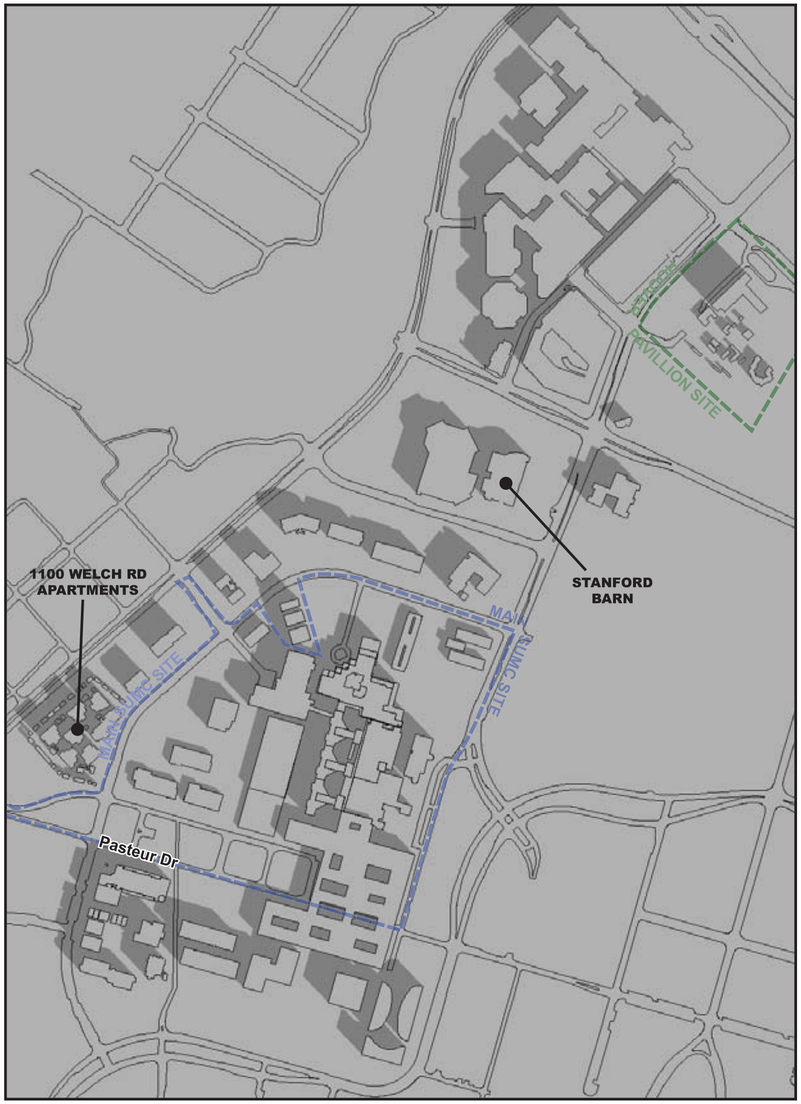


Proposed

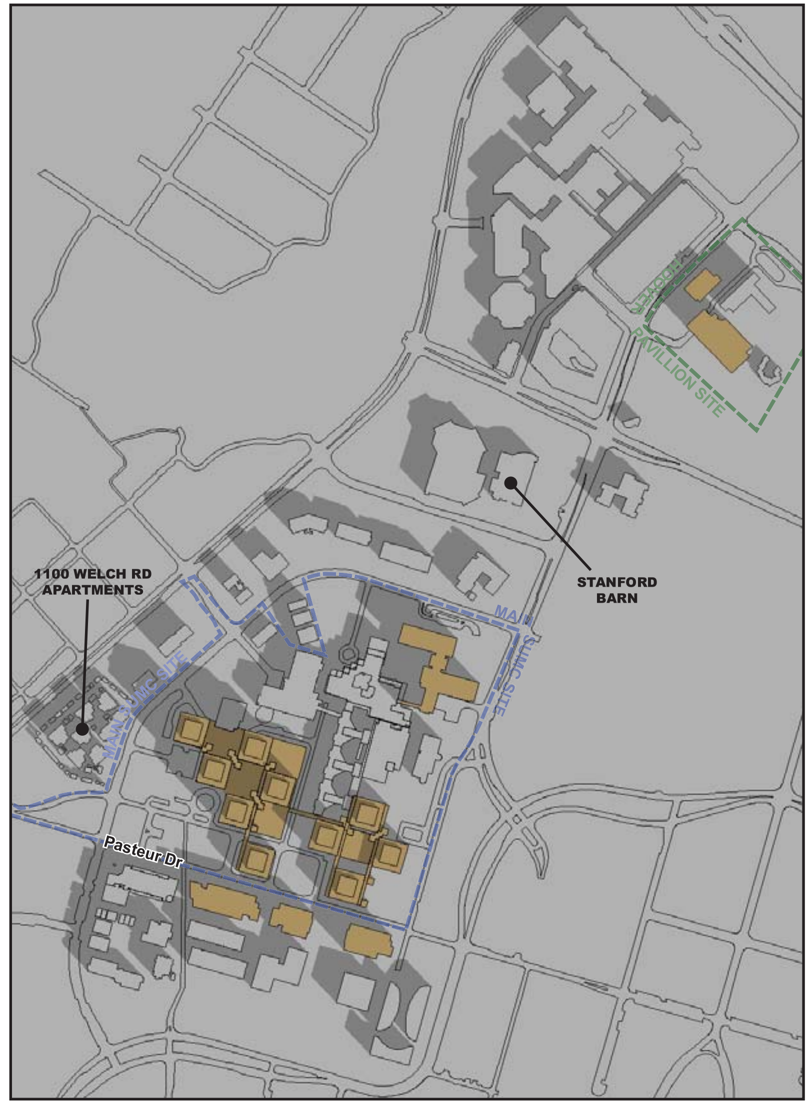
Source: SUMC, 2010.

FIGURE 3.3-13
September 21 Morning Shadows (9:00 a.m.)

D41074.00



Existing

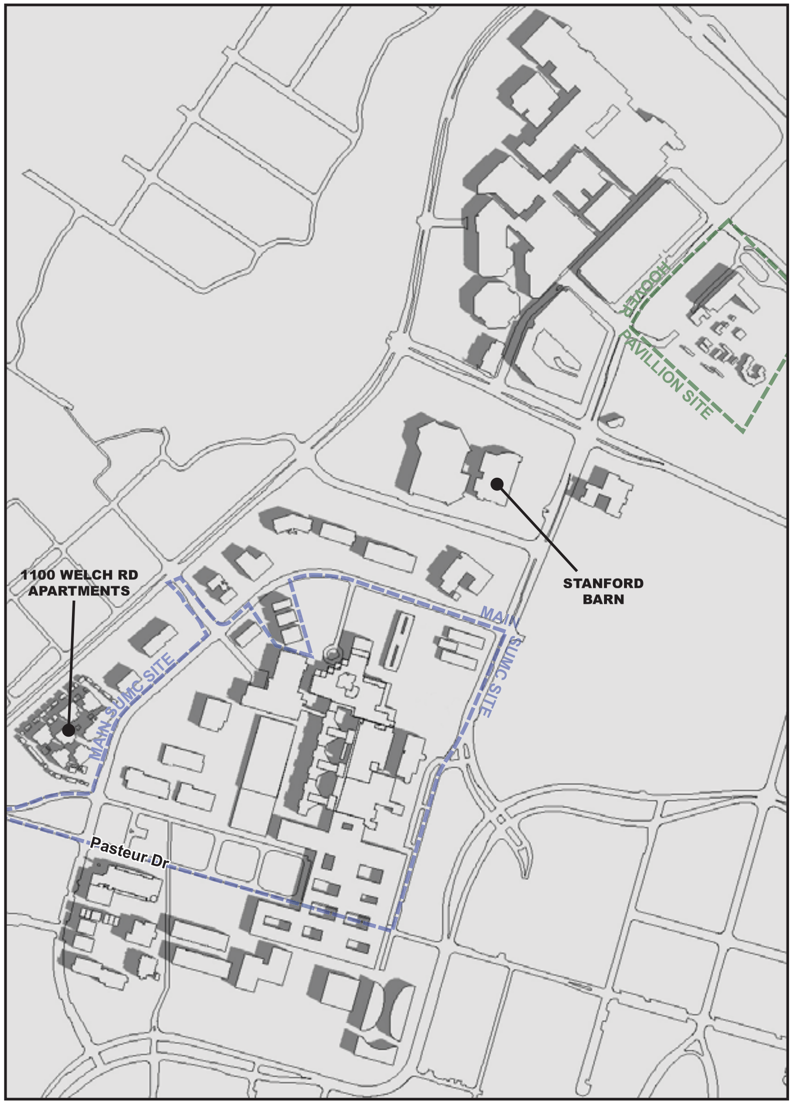


Proposed

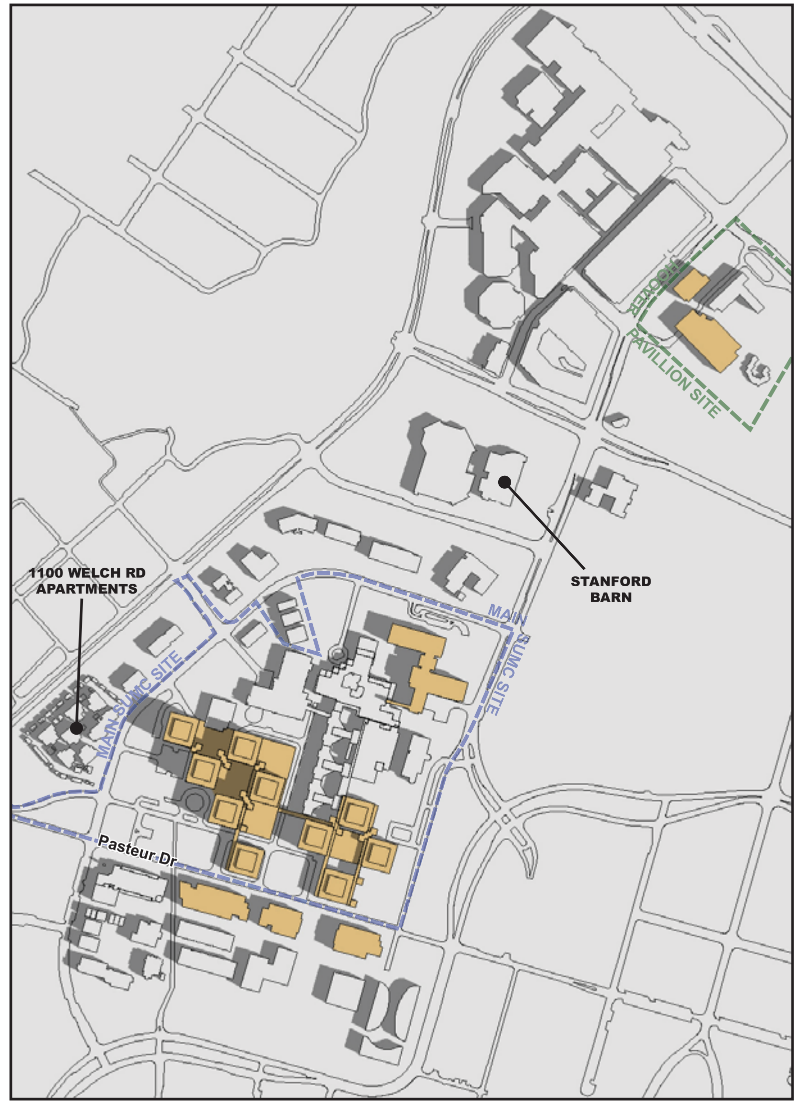
Source: SUMC, 2010.

FIGURE 3.3-14
December 21 Morning Shadows (9:00 a.m.)

D41074.00



Existing

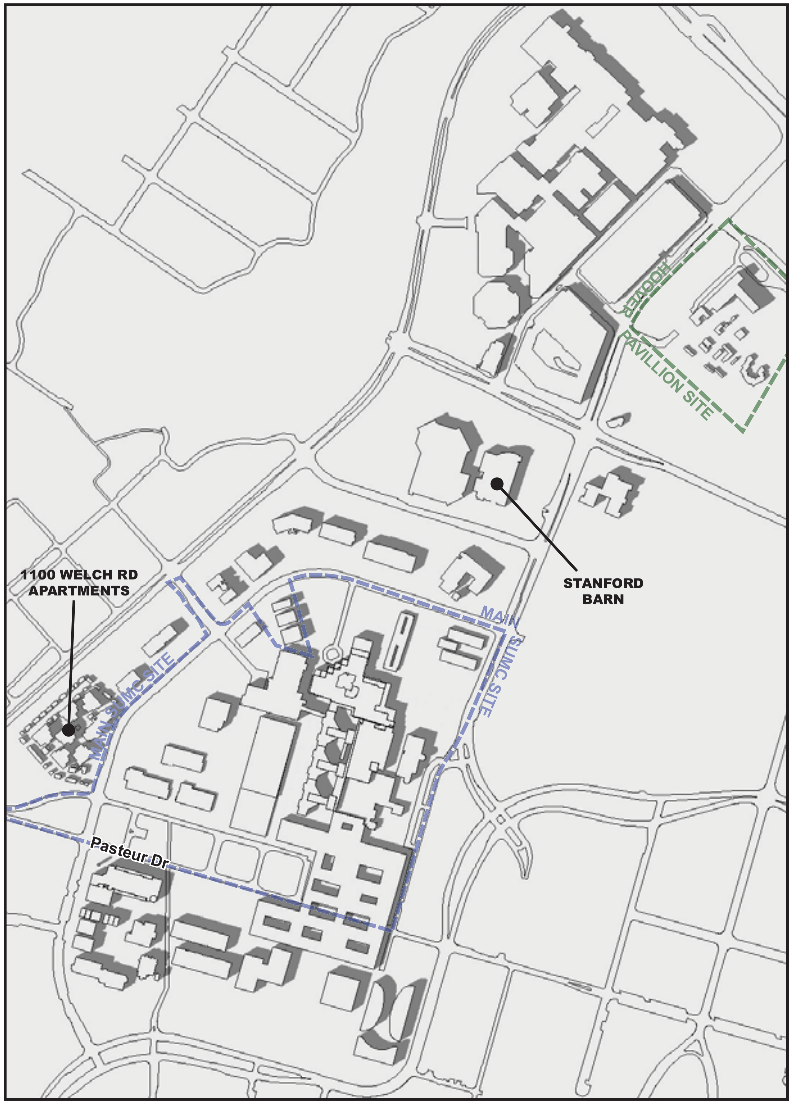


Proposed

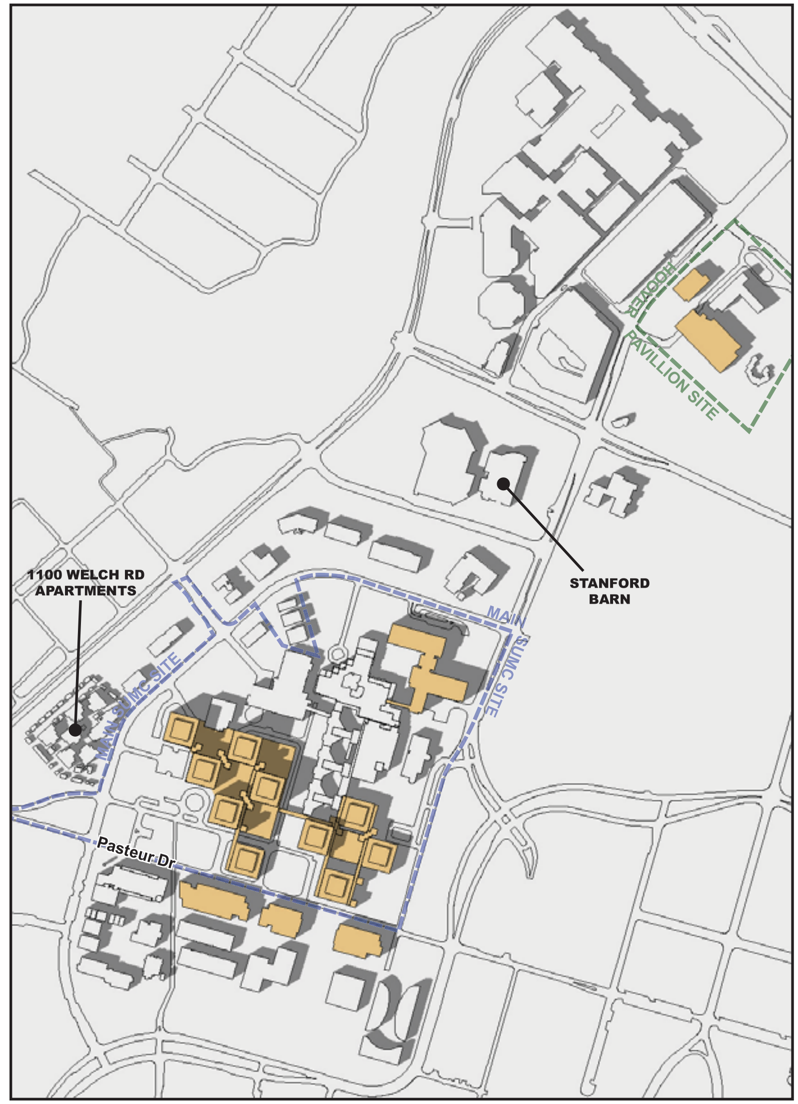
Source: SUMC, 2010.

FIGURE 3.3-15
March 21 Morning Shadows (9:00 a.m.)

D41074.00



Existing



Proposed

Source: SUMC, 2010.

PBS&J

FIGURE 3.3-16
September 21 Late Afternoon Shadows (3:00 p.m.)

D41074.00

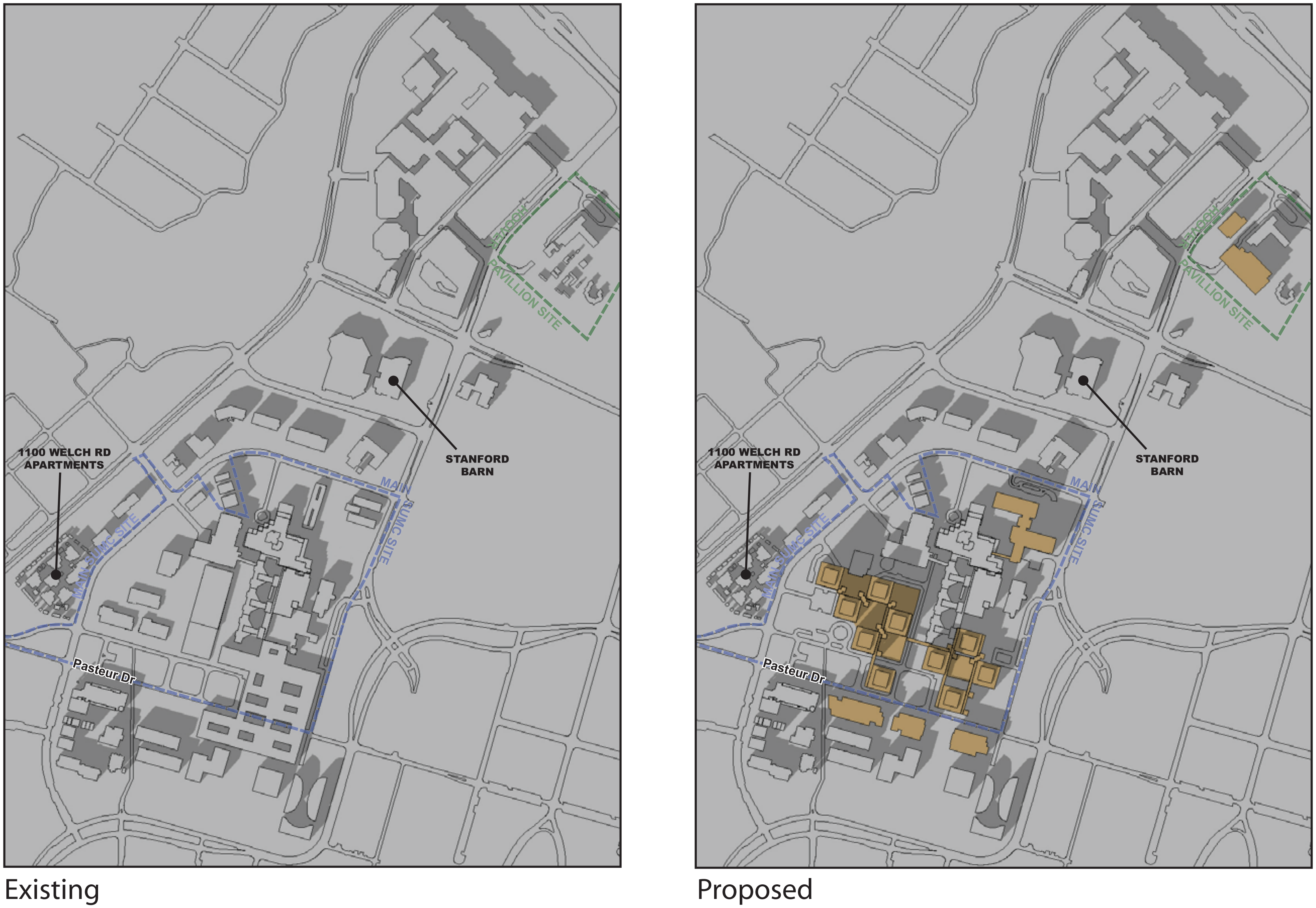
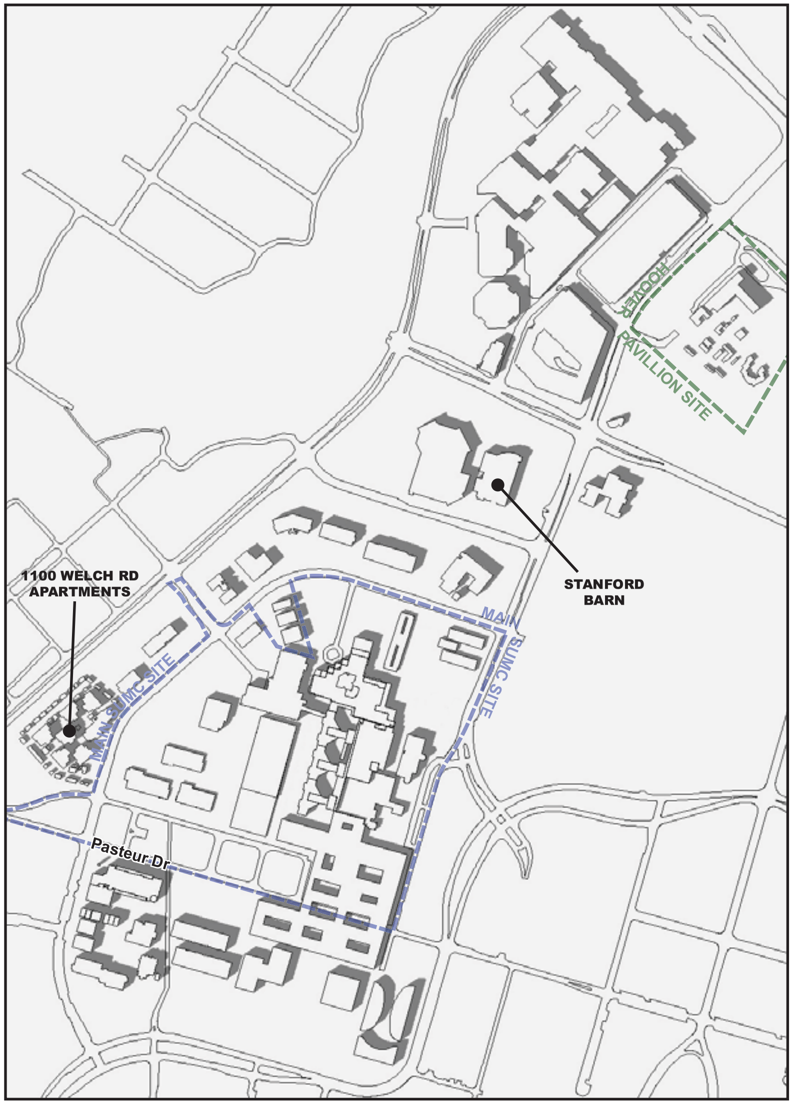


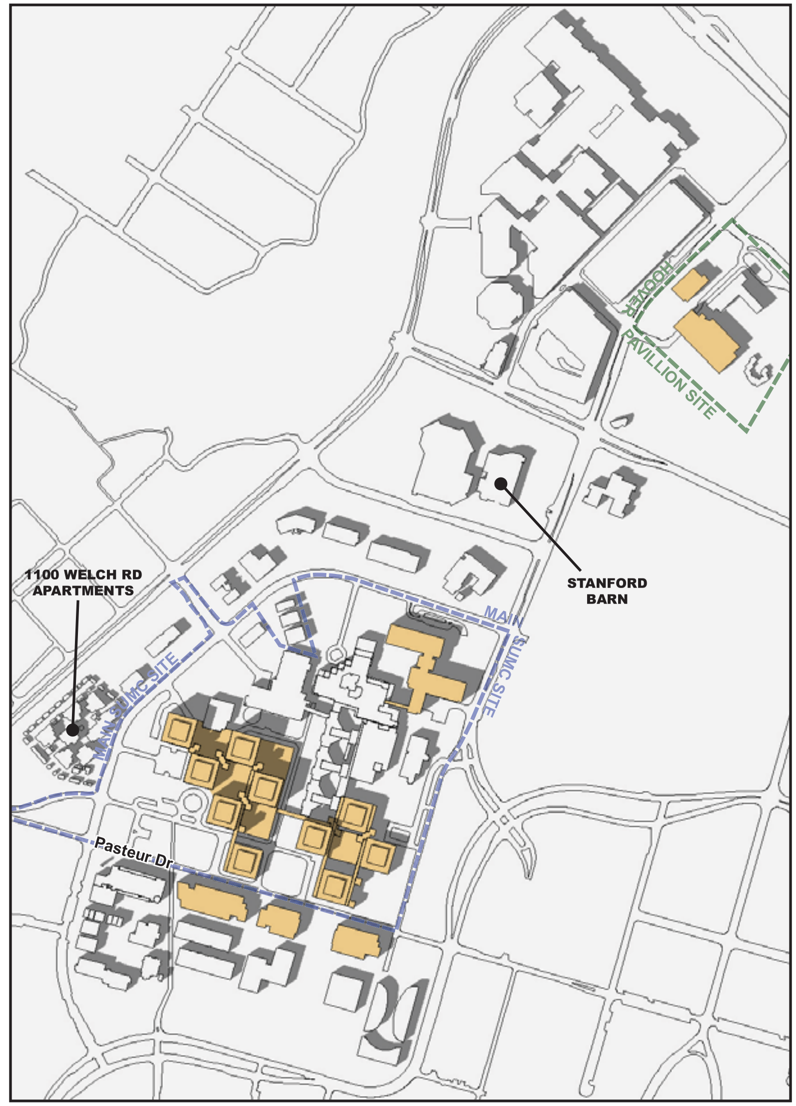
FIGURE 3.3-17
December 21 Late Afternoon Shadows (3:00 p.m.)

Source: SUMC, 2010.

D41074.00



Existing



Proposed

Source: SUMC, 2010.

PBS&J

FIGURE 3.3-18
March 21 Late Afternoon Shadows (3:00 p.m.)

D41074.00

the existing Stanford Shopping Center garage along Quarry Road; however, this garage use is not sensitive to shadows. At 9:00 a.m., the SUMC Project would not cast new shadows at open spaces or trails along Sand Hill Road, El Camino Real, south of Quarry Road, or west of Pasteur Drive.

Afternoon Shadows. As shown in Figure 3.3-16 through Figure 3.3-18, especially on December 21, 3:00 p.m. shadows from the SHC modules, LPCH structure, and Hoover Pavilion structures would be cast on nearby properties. New shadows would not be cast on the common open spaces at the 1100 Welch Road Apartments. New shadows would be cast at the terminus of Pasteur Drive, although this area is not a recreational field, trail, plaza, or courtyard. The LPCH structure would cast a new shadow onto the parking areas of the Stanford Barn and nearby medical office uses, although these parking areas are not sensitive to shadows. The Hoover Pavilion Site medical office building and garage would cast a new shadow onto on-site parking areas and would not affect pathways south of the Hoover Pavilion Site. At 3:00 p.m., the SUMC Project would not cast new shadows at open spaces or trails along Sand Hill Road, El Camino Real, south of Quarry Road, or west of Pasteur Drive.

Cumulative Analysis

The geographic context for the analysis of cumulative visual quality impacts includes the SUMC Sites plus adjacent development on the Stanford University campus and other adjacent portions of Palo Alto that would be visible to an observer who could also see the SUMC Project. Portions of Menlo Park on the other side of the San Francisquito Creek open space are not included since the heavily vegetated open space serves as a visual barrier between Palo Alto and Menlo Park. As explained earlier in this section, the SUMC Project would not be visible from those portions of Menlo Park due to the flat topography in the area and heavy vegetation along the creek. The geographic context also includes scenic routes from which the SUMC Project plus other existing and reasonably foreseeable probable future development could be visible, including Sand Hill Road, El Camino Real, and nearby public streets.

The above project-specific analysis found that the SUMC Project would have no visual impact from terrain modifications. As a result, the SUMC Project would have no potential to contribute to cumulative impacts from terrain modifications, and this topic is not addressed below.

VQ-7. Cumulative Impacts on Visual Character. The SUMC Project, in combination with other reasonably foreseeable probable future development in the area, would have a less-than-significant cumulative impact on visual character in the vicinity of the SUMC Sites. (LTS)

The geographic context for changes in visual character includes the SUMC Sites and adjacent areas that would be visible to an observer who could also see the SUMC Project. Other reasonably foreseeable probable developments in this context include (1) approved but unconstructed development under the Stanford University Community Plan and General Use Permit (CP/GUP), which would include additional academic facilities, housing units, parking, and associated utilities, roadways and bikeways in the adjacent Stanford University property; and (2) demolition of existing structures and construction of a three-story medical office building at 777 Welch Road. The California High Speed Train (HST) project would construct train tracks either underground or at-grade to the east of El Camino Real. In either case the tracks would not be cumulatively visible in relation to the SUMC Project. The Caltrain Electrification project and the HST project would construct an overhead contact system along the tracks; this overhead contact system also would not be cumulatively visible in relation to the SUMC Project, especially since the railway projects would occur at the opposite side of El Camino Real from the SUMC Sites, and viewers would have to face opposite directions to see both the SUMC Project and the HST project.

Any major development within the City, including the SUMC Project and other adjacent projects, such as the construction of a three-story replacement medical office building at 777 Welch Road, would be subject to the City's Architectural Review process. Section 18.76.020 of the Municipal Code states that no permit required under Title 2, Title 12, or Title 16 shall be issued for a major project (a project involving the construction of a non-residential building of over 5,000 square feet) unless an application for Architectural Review is reviewed, acted upon, and approved or approved with conditions. The ARB reviews development projects against rigorous criteria and provides its recommendations, to be acted upon by the Planning Director or City Council. Architectural Review approval requires findings concerning the resulting visual character of each subject project (see Applicable Plans and Regulations).

Development under the CP/GUP includes housing at El Camino Real and Quarry Road and at Quarry Road and Arboretum Road, within County lands. This development would not be subject to the City's Architectural Review process. However, the County requires implementation of mitigation identified in the Stanford University CP/GUP Application EIR; this mitigation involves incorporation of landscaping and setbacks pursuant to Palo Alto requirements, as well as coordination with the Palo Alto Planning Division. The required mitigation reduces the visual impacts from the housing construction to less than significant, according to the CP/GUP EIR.[21]

In light of the required Architectural Review for projects within City limits and in light of the requirements for CP/GUP development, cumulative impacts would be less than significant.

VQ-8. Cumulative Impacts on Sensitive Views. The SUMC Project, in combination with other reasonably foreseeable future development in the area, would have less-than-significant cumulative impacts on sensitive views. (LTS)

The geographic context for cumulative impacts on views includes existing and reasonably foreseeable probable future development projects visible from the Sand Hill Road scenic route, El Camino Real, other public streets that run along the SUMC Sites (Quarry Road, Welch

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[21] County of Santa Clara, Stanford University Draft Community Plan and General Use Permit Application Draft Environmental Impact Report, Volume 1, December 18, 2000.

Road, and the public portion of Pasteur Drive). Consideration is given to whether the same views of scenic resources that would be affected by the SUMC Project would also be affected by other foreseeable development.

Views from Sand Hill Road. According to the analysis in Impact VQ-3, the SUMC Project would obstruct foothill views from the western segment of Sand Hill Road (facing east from higher elevations), the eastern segment of Sand Hill Road (see Figure 3.3-10, Vantage Point 2), or El Camino Real and Quarry Road (see Figure 3.3-12, Vantage Point 3).

Facing east from Sand Hill Road near Santa Cruz Avenue, other reasonably foreseeable probable future development that would be visible would be within Palo Alto and lower portions of Stanford University. All major development within the City would be subject to Architectural Review, through which the City cannot approve each project unless it is found that natural features are appropriately preserved and integrated with the project; the design promotes harmonious transitions in scale and character in areas between different designated land uses; and the planning and siting of the various functions and buildings on the site create an internal sense of order and provide a desirable environment for occupants, visitors and the general community. Development under the CP/GUP would be subject to discretionary review by the County's Architecture and Site Approval (ASA) Committee. Section 5.40.010 of the County Municipal Code states that the purpose of the ASA "is to maintain the character and integrity of zoning districts by promoting quality development in harmony with the surrounding area, ..." It is expected that development under the CP/GUP would not substantially obstruct views of the East Bay hills due to the ASA review. Cumulative impacts on views of the East Bay hills from the western segment of Sand Hill Road near Santa Cruz Avenue would be less than significant.

Obstruction of foothill views from the eastern segment of Sand Hill Road would occur facing southwest from Sand Hill Road near Arboretum Road (see Figure 3.3-10, Vantage Point 2). The only foreseeable development that could cumulatively affect views from this vantage point is the SUMC Project. As such, there would be no cumulative impact from Sand Hill Road near Arboretum.

In terms of overall visual character of Sand Hill Road, the only development projected along this corridor within the City is the SUMC Project. Development under the CP/GUP would not substantially alter the character along Sand Hill Road since under the Stanford Development Agreement, development is precluded within areas north of the Stanford golf course and stable site area (along Sand Hill Road).[22] Any potential development further west along Sand Hill Road would not visually cumulate with the SUMC Project due to distance.

[22] Santa Clara County Planning Office, Stanford University 2000 General Use Permit, "Conditions of Approval," approved December 12, 2000; Stanford University, *Stanford Community Plan*, November 19, 1999, amended April 19, 2000.

Views from El Camino Real and Quarry Road. No foreseeable developments other than the SUMC Project would be visible from this vantage point. As such, there would be no cumulative impacts from this vantage point.

Views from Welch Road. Cumulative development visible from Welch Road would include the SUMC Project and the reasonably foreseeable probable future development at 777 Welch Road. As stated earlier in this section, there are no foothill views from this road due to intervening structures. As such, there would be no cumulative impact on views of foothills from Welch Road.

Views from Arboretum Road. Impacts from the intersection of Arboretum Road and Sand Hill Road are addressed above. No foreseeable developments other than the SUMC Project would be visible from the remainder of Arboretum Road. Therefore, no cumulative impact would occur from the remainder of Arboretum Road.

Views from the Public Portion of Pasteur Drive. As stated under Impact VQ-3, the SUMC Project would not obstruct views of foothills from the public portion of Pasteur Drive. As such, the SUMC Project would not contribute to a cumulative impact on views from the public portion of Pasteur Drive.

Views from Other Sensitive Vantage Points. Other sensitive vantage points that would have views of the SUMC Project include residences along Welch Road, Sand Hill Road, and the San Francisquito Creek open space. However, none of these areas feature significant views of foothills within the line of sight of the SUMC Project. Also, based on the cumulative project list in Appendix B, no other reasonably foreseeable probable future development could, when considered together with the SUMC Project, have a considerable impact or compound or increase other environmental impacts on views of the foothills. As such, there would be no cumulative impacts on views from these vantage points.

VQ-9. Cumulative Light and Glare. The SUMC Project, in combination with other reasonably foreseeable probable future development in the area, would be subject to Architectural Review and Municipal Code, and County requirements pertaining to light and glare. Impacts would therefore be less than significant. (LTS)

Reasonably foreseeable probable future projects within City limits, including the SUMC Project and other projects along Sand Hill Road, Welch Road, and El Camino Real, would be subject to Section 18.23.030 of the Municipal Code, which requires design measures that would preclude significant light spillage. Development under the CP/GUP is required to prepare a lighting plan for each development that would prevent significant glare from lighting.[23]

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23 Santa Clara County Planning Office, Stanford University 2000 General Use Permit, approved December 12, 2000.

Potential glare from reflective surfaces associated with the SUMC Project is not likely to combine with glare from reflective surfaces from other reasonably foreseeable probable future projects. Other reasonably foreseeable probable future projects that could potentially have cumulative glare impacts in combination with the SUMC Project are the potential future development at 777 Welch Road, and development under the CP/GUP. Due to Architectural Review requirements, distance, intervening landscaping, and varying orientation of cumulative structures, cumulative glare impacts are not reasonably expected to occur. Impacts are thus considered less than significant.

VQ-10. Cumulative Shadows. Shadows from the SUMC Project are not expected to combine with shadows from other nearby reasonably foreseeable probable future development. There would be no cumulative impacts. (NI)

Because shadows from the SUMC Project extend over a relatively small geographic area, the only other projects that could result in cumulative shadows in combination with the SUMC Project are in the immediate vicinity of the SUMC Sites. The only foreseeable project that would occur within the immediate vicinity of the SUMC Sites is the potential three-story medical clinic development proposed at 777 Welch Road and CP/GUP development adjacent to the Hoover Pavilion Site. 777 Welch Road is already developed and is not adjacent to or in close proximity to public open space. Therefore, this development would not have the potential to contribute to cumulative shading of an open space. Development under the CP/GUP would eliminate the open space at Quarry Road and El Camino Real rather than cast shadows on that open space; as such, development under the CP/GUP would not result in cumulative shadow impacts relative to the SUMC Project.

The SUMC Project would result in shading within the interior of the SUMC Sites; however, the SUMC Project would not cast new shadows at open spaces or trails along Sand Hill Road, El Camino Real, south of Quarry Road, or west of Pasteur Drive. Shading from the SUMC Project would not combine at any public open space areas. Overall, there would be no cumulative shadow impacts with respect to the SUMC Project.

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3.4 TRANSPORTATION

Introduction

This section of the EIR evaluates the potential transportation impacts resulting from construction and operation of the SUMC Project. Potential impacts could result from the addition of project related pedestrian, bicycle, transit, and auto trips to the surrounding roadways and intersections, resulting in a substantial increase in traffic in relation to the existing traffic load and capacity of the street system, or otherwise exceed the City's traffic-related thresholds of significance. Standards of impact significance are established on which to base the assessment of transportation impacts. Mitigation measures intended to reduce identified transportation impacts are provided.

This section of the EIR is based primarily on the Transportation Impact Analysis prepared by AECOM Transportation (Appendix C of this EIR).[1] Other sources consulted for the preparation of this section include the City of Palo Alto's Traffic Analysis Guidelines, and the Santa Clara County Valley Transportation Authority (VTA) Congestion Management Program's Traffic Level of Service Analysis Guidelines.

Transportation related issues and comments identified in response letters to the NOP and during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project were considered in preparing this analysis. The comments that were received pertained to parking supply; automobile, transit, bicycle, and pedestrian circulation; emergency vehicle access to the hospitals; and impacts to specific roads and intersections. These comments were received from the Palo Alto Planning and Transportation Commission, Caltrans, Santa Clara County, City of Menlo Park, Stanford University, the Crescent Park Neighborhood Association, the League of Women Voters, the College Terrace Residents Association, the Hayward Area Planning Association, and individual members of the public. The Transportation Impact Analysis conducted for this EIR addressed these issues.

Existing Conditions

The Main SUMC Site and the Hoover Pavilion Site collectively represent the SUMC Sites. Most of the SUMC Sites falls within a narrow part of the City of Palo Alto that is situated between the City of Menlo Park to the northeast, and Stanford University to the southwest. Figure 2-1, in Section 2, Project Description shows the two individual sites that collectively comprise the SUMC Sites, in relation to the boundary between the Palo Alto/Menlo Park boundary, and the rest of the Stanford University campus.

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[1] AECOM Transportation, *Stanford University Medical Center Environmental Impact Report Transportation Impact Analysis*, March 2010.

Study Area Definition

Figure 3.4-1 shows the Study Area and all analyzed intersections, which are defined on Table 3.4-1 later in this section. The Study Area for this transportation analysis is bordered by Marsh Road to the north; the Bayfront Expressway (SR 84) to the northeast; the intersection of the Junipero Serra Freeway (I-280) and Sand Hill Road to the west; and the intersection of Charleston Road and Arastradero Road to the south.

Roadway Network

The regional and local roadway network, intersections, freeway segments, public transit service, and bicycle and pedestrian network are described below.

Regional Access. Regional access would primarily be provided via US 101, I-280, and State Route 84 (SR 84). El Camino Real (SR 82) provides regional as well as local access.

US 101, also known as Bayshore Freeway, is an eight lane freeway that runs the length of California. It connects the Study Area with San Francisco to the north, and San Jose and Los Angeles to the south. Project traffic can access US 101 at interchanges at Embarcadero Road, University Avenue, Willow Road, and Marsh Road.

I-280 is an eight lane freeway that runs north-south, parallel to US 101, from San Francisco in the north to San Jose in the south. Project traffic can access I-280 at the Sand Hill Road, Alpine Road, and Page Mill Road interchanges.

SR 84, also known as the Bayfront Expressway, is a six lane freeway running east-west. It crosses San Francisco Bay, and provides connections to East Bay cities such as Fremont and Oakland, and other points east. Both University Avenue and Willow Road feed into SR 84 east of US 101.

Local Access. For the most part, the roadway network surrounding the SUMC Sites follows an off-set grid street pattern. Sand Hill Road, El Camino Real, and Palm Drive roughly define the northern, eastern, and southern boundaries[2] of the road network immediately surrounding the SUMC Sites.

[2] Direction based on Project North, which points towards Sand Hill Road. El Camino Real is conventionally described as a north-south major arterial although it runs closer to west-east in the vicinity of the SUMC Sites. In keeping with this convention, this EIR treats true northwest as Project North and describes facilities accordingly. See, *e.g.,* Figure 2-1 and Figure 3.4-1

Source: AECOM Transportation, 2010.

FIGURE 3.4-1

Transportation Analysis Study Area and Intersections

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Stanford University Medical Center Facilities Renewal and Replacement Project

Sand Hill Road is a tree lined arterial that varies between two and four lanes wide in the immediate vicinity of the SUMC Sites, with a landscaped median, Class II bicycle lanes on both sides of the street, sidewalks that are set back from the roadway by planting strips, and runs in a southwest to northeast direction. There is a mix of residential and commercial development along both sides of the road. It serves as the northern border for the Main SUMC Site. It also connects to several other major roadways, in particular I-280, Junipero Serra Boulevard, and El Camino Real.

El Camino Real (SR 82) is a tree lined arterial that is six lanes wide (three lanes in each direction) in the vicinity of the SUMC Sites, with center turn lanes alternating with a raised median with some plantings, sidewalks on both sides of the street, and runs in a northwest to southeast direction. There is a mixture of residential, commercial, and academic (Stanford) development fronting El Camino Real. It runs the length of the San Francisco Bay peninsula, from the City of San Francisco in the north, to the City of San Jose in the south. Also, El Camino Real is classified as a truck route with parking on both sides of the roadway.

Palm Drive alternates between two and four lanes wide, and runs in a southwest to northeast direction. It acts as the main entrance or front door to the Stanford University campus. As the name implies, it is lined with palm trees along both sides of the road, located in a planting strip between the road and sidewalk. It connects to the Caltrain commuter rail station located between El Camino Real and Alma Streets. East of El Camino Real, it becomes University Avenue.

There are several other local roads surrounding the SUMC Sites that are used for internal circulation, and provide connections to surrounding neighborhoods.

Embarcadero Road is a four-lane arterial that runs east-west from the intersection of El Camino Real, through the US 101 interchange and terminates near the Palo Alto Municipal Airport. West of El Camino Real, Embarcadero Road becomes Galvez Street, which provides a link to Arboretum Road on the Stanford University campus. A short segment of Embarcadero Road underneath the Caltrain tracks is narrowed to three lanes. Embarcadero Road is classified by the City of Palo Alto as a Major Arterial roadway.

Galvez Street is a two lane collector running parallel to the south of Palm Drive. The northern side of the road features a natural landscaped area, with no commercial or residential development. Stanford University athletic facilities are located to the south, accessed from Galvez via Nelson Road and Campus Drive. It is a major entranceway to the Stanford University campus from the east, and becomes Embarcadero Road east of El Camino Real. Embarcadero Road alternates between three and six lanes, crosses El Camino Real, and continues eastward and connects with US 101.

University Avenue varies between two and four lanes and runs in an east-west direction from the Dumbarton Bridge (SR 84) in the City of East Palo Alto to the El Camino Real grade-separated interchange, where it becomes Palm Drive. From SR 84 to US 101, University Avenue is a four lane arterial. It narrows to two lanes through the residential and downtown areas of the City of Palo Alto.

Near the Caltrain overcrossing, University Avenue again widens to four lanes until it becomes Palm Drive.

Arboretum Road alternates between two, three, and four lanes. It connects Sand Hill Road with Galvez Street. The northern section of the road, up near Sand Hill Road travels through a more developed area, and features planted medians, and sidewalks on both sides of the street.

Quarry Road is a four lane arterial that runs perpendicular to Arboretum Road, runs adjacent to the SUMC Sites, and connects El Camino Real with Campus Drive on the Stanford University campus.

Junipero Serra Boulevard is a two lane undivided minor arterial that runs in the north-south direction, parallel to I-280. It connects Alpine Road in the north with Page Mill Road in the south. South of Page Mill Road, it becomes Foothill Expressway. With the exception of Stanford University's golf course which straddles the road, and a few other Stanford University properties that are located west of the road, Junipero Serra Boulevard serves as the western boundary for the main part of the Stanford University campus.

Middlefield Road varies between two and four lanes and runs in a north-south direction, parallel to US 101. It connects Redwood City in the north with the City of Mountain View in the south. The major intersections along Middlefield Road are all signalized. The City of Palo Alto classifies Middlefield as a minor arterial.

Alma Street is a four lane arterial that runs in the north-south direction, parallel and immediately adjacent to the Caltrain railroad tracks. Alma Street runs south from its intersection with Palo Alto Avenue, to San Antonio Road in the City of Mountain View. From that point south, it becomes Central Expressway.

Page Mill Road/Oregon Expressway varies between two and four lanes and runs in an east-west direction from Skyline Boulevard (SR 35) in the west to US 101 in the east. The western part of the road, from Skyline Boulevard to I-280 is a narrow and winding two lane road. From I-280 to its intersection with Birch Street, between El Camino Real and Alma Street, Page Mill Road is a four lane divided arterial. At this point, the road continues eastward as the Oregon Expressway and connects with the US 101.

Alpine Road is a two lane road that originates approximately 12 miles west of the Stanford University campus, just north of Pescadero Creek County Park, and travels east and north, intersecting with Portola Road, and I-280 and eventually intersects with Junipero Serra Boulevard, just south of Sand Hill Road. The section of Alpine Road within the Study Area is classified as a minor arterial.

Santa Cruz Avenue starts as a four lane road at the intersection of Sand Hill Road and Alpine Road, and travels north where it forks with Alameda de las Pulgas. From the fork, it continues north and east as a two lane road, traversing a residential neighborhood in the City of Menlo Park. It terminates at El Camino Real, near downtown Menlo Park. Santa Cruz Avenue is classified as a minor arterial.

Stanford Avenue is a two lane collector that runs in an east-west direction from Junipero Serra Boulevard in the west to Park Boulevard in the east. The road runs parallel to Page Mill Road. The section of the road east of El Camino Real has on-street parallel parking along its south side.

Marsh Road varies between two and four lanes and runs in an east-west direction from Middlefield Road in the west to the SR 84. The two lane segment of Marsh Road becomes four lanes near its intersection with Fair Oak Avenue. It continues eastward to an interchange with the US 101, and then a short distance further to the intersection with the Bayfront Expressway. The road is classified as a local street west of Bohannon Road, and as a primary arterial east of Bohannon.

Willow Road varies between two and four lanes and runs in an east-west direction from Alma Street in the west, to SR 84 in the east. It intersects Middlefield Road and Bayshore Freeway (US 101), and runs parallel to Marsh Road and University Avenue. It is classified as a primary arterial from Bayfront Expressway to Middlefield Road.

Study Area Intersections. The traffic study analyzed a total of 66 intersections.[3] Sixty of these intersections are signalized and the following six are unsignalized:

- Galvez Street/Arboretum Road
- Stanford Road/Bowdoin Street
- I-280 Northbound Off-Ramp/Alpine Road
- I-280 Southbound Off-Ramp/Alpine Road
- Page Mill/I-280 Northbound Off-Ramp
- Page Mill/I-280 Southbound Off-Ramp

The Transportation Impact Analysis analyzed a total of 66 intersections in the City of Palo Alto, City of Menlo Park, and City of East Palo Alto. Four intersections are within Santa Clara County. Among these intersections is the Durand Way Extension/Welch Road intersection in the City of Palo Alto; this intersection would be constructed as part of the SUMC Project and does not currently exist. This intersection is analyzed under Future Conditions. The location of each intersection is indicated on Figure 3.4-1. These study locations were chosen to represent those intersections deemed most likely to experience increases in traffic due to implementation of the SUMC Project, and all locations that could potentially experience significant project related impacts, and are shown below in Table 3.4-1.

[3] The 66 intersections include five intersections that were split into two directions, including Junipero Serra Boulevard and Campus Drive, Marsh Road and US 101, Welch Road and Pasteur Drive, I-280 and Alpine Road, and I-280 and Page Mill Road.

Table 3.4-1
Study Intersections

#	Intersections	City/Jurisdiction	Source and Date of Count
1	El Camino Real and Valparaiso-Glenwood Avenue	Menlo Park	AECOM Transportation, October 2007
2	El Camino Real and Santa Cruz Avenue	Menlo Park	MP October 2006
3	El Camino Real and Ravenswood-Menlo Avenue	Menlo Park	MP October 2006
4	El Camino Real and Roble Avenue	Menlo Park	MP October 2006
5	El Camino Real and Middle Avenue	Menlo Park	MP October 2006
6	El Camino Real and Cambridge Avenue	Menlo Park	MP October 2006
7	El Camino Real and Sand Hill Road-Alma Street	Palo Alto	AECOM Transportation, February 2008
8	El Camino Real and Quarry Road	Palo Alto	PA Monitoring October 2006
9	Alma Street and Lytton Avenue	Palo Alto	AECOM Transportation, October 2007
10	El Camino Real and University Avenue-Palm Drive[a]	Palo Alto	PA Monitoring October 2007
11	El Camino Real and Embarcadero Road-Galvez Street	Palo Alto	AECOM Transportation, February 2008 (AM)
			PA Monitoring October 2007 (PM)
12	El Camino Real and Churchill Avenue	Palo Alto	PA Monitoring October 2007
13	El Camino Real and Serra Street-Park Boulevard	Palo Alto	AECOM Transportation, October 2007
14	El Camino Real and Stanford Avenue	Palo Alto	AECOM Transportation, October 2007
15	El Camino Real and California Avenue	Palo Alto	AECOM Transportation, October 2007
16	El Camino Real and Page Mill Road-Oregon Expressway	Palo Alto	PA Monitoring October 2007
17	Woodland Avenue and University Avenue	East Palo Alto	PA Monitoring October 2007
18	Middlefield Road and Willow Road	Menlo Park	MP October 2006
19	Middlefield Road and Lytton Avenue	Palo Alto	AECOM Transportation, October 2007
20	Middlefield Road and University Avenue	Palo Alto	PA Monitoring October 2007
21	Middlefield Road and Embarcadero Road	Palo Alto	PA Monitoring October 2007
22	Alma Street and Churchill Avenue	Palo Alto	PA Monitoring October 2006
23	Junipero Serra Boulevard-Foothill Expressway/Page Mill Road	Palo Alto	PA Monitoring October 2007
24	Junipero Serra Boulevard and Stanford Avenue	Santa Clara County	AECOM Transportation, October 2007
25	Junipero Serra Boulevard and Campus Drive East	Santa Clara County	AECOM Transportation, October 2007
26	Junipero Serra Boulevard and Campus Drive West	Santa Clara County	PA Monitoring October 2006

Table 3.4-1
Study Intersections

#	Intersections	City/Jurisdiction	Source and Date of Count
27	Junipero Serra Boulevard and Alpine Road-Santa Cruz Avenue	Menlo Park	MP October 2006
28	Sand Circle and Sand Hill Road/I-280	Menlo Park	AECOM Transportation, October 2007
29	Sharon Park Drive and Sand Hill Road	Menlo Park	MP November 2006
30	Santa Cruz Avenue and Sand Hill Road	Menlo Park	MP October 2006
31	Oak Avenue and Sand Hill Road-Vine Street	Menlo Park	MP November 2006
32	Stockfarm Road and Sand Hill Road	Palo Alto	AECOM Transportation, October 2007
33	Pasteur Drive and Sand Hill Road	Palo Alto	AECOM Transportation, October 2007
34	Arboretum Road and Sand Hill Road	Palo Alto	PA Monitoring October 2006
35	Arboretum Road and Quarry Road	Palo Alto	PA Monitoring October 2006
36	Arboretum Road and Palm Drive	Palo Alto	PA Monitoring October 2007
37	Arboretum Road and Galvez Street	Stanford University	PA Monitoring October 2006
38	El Camino Real and Charleston Road	Palo Alto	AECOM Transportation, February 2008
39	Alma Street and Charleston Road	Palo Alto	PA Monitoring October 2007
40	Middlefield Road and Charleston Road	Palo Alto	PA Monitoring October 2007
41	Hamilton Avenue and Middlefield Road	Palo Alto	AECOM Transportation, February 2008
42	Hamilton Avenue and Alma Street	Palo Alto	AECOM Transportation, February 2008
43	Santa Cruz Avenue and University Drive	Menlo Park	MP October 2006
44	El Camino Real and Oak Grove Avenue	Menlo Park	MP October 2006
45	Middlefield Road and Ringwood Avenue	Menlo Park	MP October 2008
46	Middlefield Road and Ravenswood Avenue	Menlo Park	MP October 2008
47	El Camino Real and Encinal Road	Menlo Park	MP October 2006
48	Marsh Road and Bay Road	Menlo Park	MP November 2006
49	Marsh Road and US 101 SB Off-Ramp	Menlo Park	MP November 2006
50	Marsh Road and US 101 NB Off-Ramp	Menlo Park	MP November 2006
51	Willow Road and Bay Road	Menlo Park	MP October 2006
52	Willow Road and Bayfront Expressway	Menlo Park	MP October 2006
53	Bayfront Expressway and University Avenue	Menlo Park	AECOM Transportation, February 2008
54	University Avenue and Bay Road	East Palo Alto	Fehr and Peers September 2007
55	University Avenue and Donohoe Street	East Palo Alto	Fehr and Peers September 2007
56	Welch Road and Quarry Road	Palo Alto	PA Monitoring October 2006
57	Durand Way Extension and Sand Hill Road	Palo Alto	AECOM Transportation, February 2008
58	Welch Road and Pasteur Drive NB	Palo Alto	PA Monitoring October 2006
59	Welch Road and Pasteur Drive SB	Palo Alto	PA Monitoring October 2006
60	Durand Way Extension and Welch Road	Palo Alto	N/A

Table 3.4-1
Study Intersections

#	Intersections	City/Jurisdiction	Source and Date of Count
61	Stanford Road and Bowdoin Street	Palo Alto	AECOM Transportation, February 2008
62	I-280 NB Off-Ramp and Alpine Road	Palo Alto	AECOM Transportation, October 2008
63	I-280 SB Off-Ramp and Alpine Road	Palo Alto	AECOM Transportation, October 2008
64	I-280 NB Off-Ramp and Page Mill Road	Palo Alto	AECOM Transportation, January 2009
65	I-280 SB Off-Ramp and Page Mill Road	Palo Alto	AECOM Transportation, January 2009
66	Foothill Expressway and Arastradero Road	Santa Clara County	PA Monitoring October 2008

Source: AECOM Transportation, 2010.
Note:
a. Two separate intersections analyzed as a single intersection because of their proximity to each other.

Residential Roadway Segments. Eight residential roadway segments were analyzed, and are shown in Figure 3.4-1:

- Santa Cruz Avenue, north of Sand Hill Road
- Sharon Road, north of Sharon Park Drive
- Stanford Avenue, north of Sand Hill Road
- Leland Avenue, north of Sand Hill Road
- Vine Street, north of Sand Hill Road
- Hawthorne Avenue, east of Alma Street
- Everett Avenue, east of Alma Street
- Hamilton Avenue, between Chaucer Street and Lincoln Avenue

Minor Arterials and Collectors. The following ten minor arterial and collector roadway segments were analyzed:

- Marsh Road, west of US 101
- Sand Hill Road, east of Santa Cruz Avenue
- Willow Road, east of Middlefield Road
- Willow Road, west of Middlefield Road
- Alpine Road, west of Junipero Serra Boulevard
- Middlefield Road, north of Ravenswood Avenue
- Middlefield Road, south of Ravenswood Avenue
- Ravenswood Avenue, east of El Camino Real

- Santa Cruz Avenue, west of El Camino Real
- Valparaiso Avenue, west of El Camino Real

Freeway Segments. The following six freeway segments were analyzed:

- US 101 north of University Avenue
- US 101 south of University Avenue
- US 101 south of Embarcadero/Oregon Expressway
- I-280 north of Sand Hill Road
- I-280 south of Alpine Road
- I-280 south of Page Mill Road

Existing Conditions

Signalized Intersections. The current procedures adopted for intersection operational analysis in Santa Clara County are from the Highway Capacity Manual (HCM) 2000. HCM 2000 analysis methods were applied using the TRAFFIX software package (version 8.0) per the requirements of the Santa Clara County Valley Transportation Authority (VTA), the designated Congestion Management Agency (CMA) for Santa Clara County. This methodology measures the operational performance of signalized intersections in terms of four measures: average control delay, critical volume to capacity ratio, average critical delay, and level of service (LOS).

TRAFFIX simulates the HCM 2000 analysis methodology. TRAFFIX evaluates intersection operations based on both average vehicle delay and critical movement delay. The Santa Clara County CMA and the City of Palo Alto require the use of TRAFFIX and the evaluation of operations using critical movement delay. In addition to calculating expected vehicle delay on which level of service is based, TRAFFIX also calculates optimal signal cycle length and intersection queuing.

- Control delay includes initial deceleration delay, queue move-up time, stopped delay, and acceleration delay. Average control delay weights the delay per movement according to the traffic volumes for that movement. Level of service for signalized intersections is defined in terms of control delay (see Table 3.4-2).
- The critical volume to capacity (V/C) ratio is an approximate indicator of the overall level of congestion at an intersection. The critical V/C ratio depends on the conflicting critical lane flow rates and the signal phasing. V/C is equal to 1.0 when the flow rate equals capacity. When volumes exceed capacity, stop-and-go conditions result and operations are designated as LOS F.
- Average critical delay weights the delay for the critical (conflicting) movements based on the traffic volume for that movement.

Table 3.4-2
Signalized Intersection Level of Service Thresholds

LOS	Average Control Delay (seconds/vehicle)
A	delay $\leq$ 10.0
B+	10.0 < delay $\leq$ 12.0
B	12.0 < delay $\leq$ 18.0
B-	18.0 < delay $\leq$ 20.0
C+	20.0 < delay $\leq$ 23.0
C	23.0 < delay $\leq$ 32.0
C-	32.0 < delay $\leq$ 35.0
D+	35.0 < delay $\leq$ 39.0
D	39.0 < delay $\leq$ 51.0
D-	51.0 < delay $\leq$ 55.0
E+	55.0 < delay $\leq$ 60.0
E	60.0 < delay $\leq$ 75.0
E-	75.0 < delay $\leq$ 80.0
F	delay > 80.0

Source: Santa Clara Valley Transportation Authority Congestion Management Program, Transportation Impact Analysis Guidelines, March 2009.

Unsignalized Intersections. Traffic conditions at unsignalized intersections were also evaluated using the HCM 2000 method, and TRAFFIX. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each movement that must yield the right-of-way. At two-way or side-street stop-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, the left-turn movement from the major street and for the entire intersection. For controlled approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. The delays for the entire intersection and for the movement or approach with the highest delay are reported. At four-way stop-controlled intersections, LOS is based on the average delay experienced on all approaches. Table 3.4-3 summarizes the relationship between delay and LOS for unsignalized intersections.

Table 3.4-3
Unsignalized Intersection LOS Criteria

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delay	< 10.0
B	Short traffic delays	10.0 < delay < 15.0
C	Average traffic delays	15.0 < delay < 25.0
D	Long traffic delays	25.0 < delay < 35.0
E	Very long traffic delays	35.0 < delay < 50.0
F	Extreme traffic delays with intersection capacity exceeded	> 50.0

Source: Highway Capacity Manual, Transportation Research Board, 2000.

Residential Roadway Segments. The Traffic Infusion on Residential Environment (TIRE) index was used to evaluate operating conditions for residential streets. TIRE is a numerical representation of a resident's perception of the effect of street traffic on activities such as walking, cycling, and children playing, as well as on the ability to maneuver an automobile in and out of residential driveways. According to TIRE, a given change in traffic volume would cause a greater impact to a residential environment on a relatively quiet residential street with a low pre-existing (before implementation of the SUMC Project) traffic volume than it would on a street with a higher pre-existing volume. An increase in the index of 0.10 is approximately equivalent to an increase in average daily traffic (ADT) of between 20 and 30 percent.

Table 3.4-4 shows the correlation between daily volumes and the corresponding TIRE Index value. As applied in the City of Palo Alto, streets with TIRE levels above 3.0 are considered traffic-dominated, while those with indexes below 3.0 are considered to be better suited for residential activities. For Menlo Park collector and minor arterial street segments, average daily trips were calculated, but not compared to the TIRE index because Menlo Park uses a different methodology based on average daily trips (ADT) without and with the SUMC Project, described further under Standards of Significance.

Freeway Segments. The adopted measure for freeway LOS evaluation in Santa Clara County is density, expressed as passenger cars per mile per lane (pcpmpl). The analysis procedures are outlined in HCM 2000, but LOS D/E and E/F density thresholds are modified here to reflect Santa Clara County conditions. The LOS thresholds for freeway segments are presented in Table 3.4-5.

Existing Traffic Volumes and Levels of Service (LOS)

Intersections. Peak Hour generally occurs between 7:00 a.m. to 9:00 a.m., and between 4:00 p.m. to 6:00 p.m. Turning movement volumes used in the Transportation Impact Analysis were obtained from the most recent Congestion Management Agency (CMA) annual monitoring counts as well as new collected counts. This traffic count data was supplemented with additional counts conducted in October 2007, January 2008, and January 2009. For each intersection count period, the hour with the highest traffic volume was identified as the Peak Hour. The existing traffic volumes for each of the analyzed intersections can be seen in the Transportation Impact Analysis prepared by AECOM Transportation (Appendix C of this EIR).

The existing Peak Hour traffic volumes were used with the existing lane configurations and signal phasing (for signalized intersections) as inputs into the LOS calculations to evaluate current operations and are summarized in Table 3.4-6. The existing intersection lane configurations and traffic control devices (stop signs or traffic signals) are shown in the Transportation Impact Analysis included in Appendix C of this EIR.

Table 3.4-4
TIRE Index

TIRE Index	Start Daily Volume	End Daily Volume	Volume to Cause +0.1 Change in TIRE Index			Traffic Volume Description
			Start	Midpoint	End	
1.5	29	44	16	14	12	Low
1.6	36	44	9	11	12	Low
1.7	45	56	12	13	14	Low
1.8	57	70	14	17	19	Low
1.9	71	89	19	20	21	Low
2.0	90	110	21	26	30	Moderate
2.1	111	140	30	35	40	Moderate
2.2	141	180	40	40	40	Moderate
2.3	181	220	40	50	60	Moderate
2.4	221	280	60	65	70	Moderate
2.5	281	350	70	85	100	Moderate
2.6	351	450	100	105	110	Moderate
2.7	451	560	110	130	150	Moderate
2.8	561	710	150	165	180	Moderate
2.9	711	890	180	195	210	Moderate
3.0	891	1100	210	255	300	High
3.1	1101	1400	300	350	400	High
3.2	1401	1800	400	400	400	High
3.3	1801	2200	400	500	600	High
3.4	2201	2800	600	650	700	High
3.5	2801	3500	700	850	1000	High
3.6	3501	4500	1000	1050	1100	High
3.7	4501	5600	1100	1300	1500	High
3.8	5601	7100	1500	1650	1800	High
3.9	7101	8900	1800	1950	2100	High
4.0	8901	11000	2100	2550	3000	Very High
4.1	11001	14000	3000	3500	4000	Very High
4.2	14001	18000	4000	4000	4000	Very High
4.3	18001	22000	4000	5000	6000	Very High
4.4	22001	28000	6000	6500	7000	Very High
4.5	28001	35000	7000	8500	10000	Very High
4.6	35001	45000	10000	10500	11000	Very High
4.7	45001	56000	11000	13000	15000	Very High
4.8	56001	71000	15000	16500	18000	Very High
4.9	71001	89000	18000	NA	NA	Very High
5.0	89001	NA	NA	NA	NA	Very High

Source: Goodrich Traffic Group.

Table 3.4-5
Level of Service Thresholds for Freeway Segments

Level of Service	Density (passenger cars/mile/lane)	Speed (miles/hour)
A	density ≤ 11.0	67.0 ≤ speed
B	11.0 < density ≤ 18.0	66.5 ≤ speed < 67.0
C	18.0 < density ≤ 26.0	66.0 ≤ speed < 66.5
D	26.0 < density ≤ 46.0	46.0 ≤ speed < 66.0
E	46.0 < density ≤ 58.0	35.0 ≤ speed < 46.0
F	58.0 < density	speed < 35.0

Source: Traffic Level of Service Analysis Guidelines, VTA, June 2003.

Table 3.4-6
Existing Peak Hour Intersection Level of Service

		AM				PM			
#	Intersection	LOS	Avg Delay	Critical V/C	Avg Crit Delay	LOS	Avg Delay	Critical V/C	Avg Crit Delay
1	El Camino Real/Valparaiso Avenue-Glenwood Avenue	C-	33.1	0.672	34.3	D	40.4	0.727	42.9
2	El Camino Real/Santa Cruz Avenue	B	12.2	0.503	11.7	B	17.5	0.568	18
3	El Camino Real/Ravenswood Avenue-Menlo Avenue	D	40	0.786	42.6	D	46.6	0.847	56.9
4	El Camino Real/Roble Avenue	B+	10.4	0.427	9.4	B+	11.5	0.454	9.3
5	El Camino Real/Middle Avenue	C	24.2	0.694	28.9	D+	36.5	0.822	39.6
6	El Camino Real/Cambridge Avenue	B	13.4	0.561	14.8	B	12.4	0.507	6.7
7	El Camino Real/Sand Hill Road-Alma Street	C	24.1	0.567	34.2	D+	35.5	0.618	42.3
8	El Camino Real/Quarry Road	B	13.7	0.369	18.5	C	23	0.478	13
9	Alma Street/Lytton Avenue	B	16.7	0.517	16.8	C	25.5	0.848	30.4
10	El Camino Real/University Avenue-Palm Drive	C	30.1	0.714	33.4	D+	37.6	0.79	41.6
11	El Camino Real/Embarcadero Road-Galvez Street	D	44.7	0.729	47.5	D	45.4	0.753	48.1
12	El Camino Real/Churchill Avenue	C	26	0.569	31.2	C	23.1	0.596	33.9
13	El Camino Real/Serra Street-Park Boulevard	B	17.2	0.473	21.7	C	25.9	0.664	30.1
14	El Camino Real/Stanford Avenue	C+	22.5	0.449	17	C+	22.3	0.608	25.8
15	El Camino Real/California Avenue	C	25	0.563	26.4	C	27.4	0.628	27.5
16	El Camino Real/Page Mill Road-Oregon Expressway	D	50.1	0.91	55.9	D	46.6	0.868	52

Table 3.4-6
Existing Peak Hour Intersection Level of Service

#	Intersection	AM LOS	AM Avg Delay	AM Critical V/C	AM Avg Crit Delay	PM LOS	PM Avg Delay	PM Critical V/C	PM Avg Crit Delay
17	Woodland Avenue/University Avenue	C	31.2	0.646	30.4	D+	38.2	0.789	44
18	Middlefield Road/Willow Road	C-	34.1	0.562	33.3	D	50.8	0.838	57.3
19	Middlefield Road/Lytton Avenue	C	24.2	0.664	24.6	D+	37.5	0.806	40
20	Middlefield Road/University Avenue	C	26.1	0.462	27	C	27.7	0.527	30
21	Middlefield Road/Embarcadero Road	D+	37.3	0.572	39.2	D+	35.7	0.62	38.1
22	Alma Street/Churchill Avenue	B-	19.1	0.657	16.6	C	27.2	0.769	30.6
23	Junipero Serra Boulevard-Foothill Expressway/Page Mill Road	**F**	83.9	1.048	103.3	**F**	82.3	0.995	103.1
24	Junipero Serra Boulevard/Stanford Avenue	B	12.3	0.614	17.1	B	15.1	0.616	18.5
25	Junipero Serra Boulevard/Campus Drive East	B+	11.5	0.489	16.4	B	12.7	0.463	15.4
26	Junipero Serra Boulevard/Campus Drive West	D+	36.3	0.611	43.4	C-	34.5	0.766	40.9
27	Junipero Serra Boulevard/Alpine Road-Santa Cruz Avenue	C	27	0.723	30.9	C	30.8	0.745	32.1
28	Sand Hill Circle- I-280/Sand Hill Road	C-	34.6	0.704	29.2	B-	19.3	0.696	21.4
29	Sharon Park Drive/Sand Hill Road	C	23.5	0.644	19.9	C+	20.6	0.625	22.7
30	Santa Cruz Avenue/Sand Hill Road	C-	33.6	0.9	42.8	D+	38.1	0.662	38.7
31	Oak Avenue/Sand Hill Road -Vine Street	A	9.2	0.651	10	A	6.8	0.675	8.1
32	Stock Farm Road/Sand Hill Road	B	15.4	0.562	16.5	C	25.3	0.666	27.2
33	Pasteur Drive/Sand Hill Road	C+	20.4	0.585	22	C+	22.5	0.534	22.8
34	Arboretum Road/Sand Hill Road	C+	20.4	0.443	22	C	24.8	0.601	27.8
35	Arboretum Road/Quarry Road	C	31.5	0.513	32.2	C	28.6	0.604	31.4
36	Arboretum Road/Palm Drive	C+	22.6	0.822	27.4	C+	20.6	0.723	21.9
37	Arboretum Road/Galvez Street/(unsignalized)	D	25.6	0.643	25.6	**F**	54.6	0.938	54.6
38	EL Camino Real/Charleston Road	D	47.4	0.723	47	D	49.7	0.834	51.9
39	Alma Street/Charleston Road	D	39.4	0.744	40.2	D	41.1	0.816	44.7
40	Middlefield Road/Charleston Road	D	39.4	0.618	41.5	D	41.7	0.727	43.4
41	Middlefield Road/Hamilton Avenue	B-	18.5	0.336	18.7	B-	18.6	0.375	19
42	Alma Street/Hamilton Avenue	B+	11.3	0.503	12.8	C+	21.1	0.618	21.8
43	University Drive/Santa Cruz Avenue	C+	21.8	0.449	26.9	C	27.7	0.52	30.1

Table 3.4-6
Existing Peak Hour Intersection Level of Service

		AM				PM			
#	Intersection	LOS	Avg Delay	Critical V/C	Avg Crit Delay	LOS	Avg Delay	Critical V/C	Avg Crit Delay
44	El Camino Real/Oak Grove Avenue	C	28.9	0.529	26.9	C-	33.4	0.566	35.3
45	Middlefield Road/Ringwood Avenue	C	28.7	0.614	31.2	C	28.4	0.713	33.6
46	Middlefield Road/Ravenswood Avenue	C+	21.1	0.666	28.6	C	26.5	0.767	36.2
47	El Camino Real/Encinal Road	B	17.7	0.592	14.5	B-	19.2	0.616	20.3
48	Bay Road/Marsh Road	B	12.4	0.51	13.6	B+	11.9	0.451	13
49	Marsh Road/US 101 SB Off-Ramp	B	16.8	0.682	17.9	B-	19.8	0.802	19.9
50	Marsh Road/US 101 NB Off-Ramp	B	14	0.514	14.7	B	14.1	0.783	15.9
51	Bay Road/Willow Road	B-	18.4	0.625	22.4	B	15.9	0.524	19.4
52	Bayfront Expressway/Willow Road	C	28.3	0.708	40.8	**E**	61.7	1.024	71.1
53	University Avenue/Bayfront Expressway	C	24.7	0.921	49.5	**E-**	80	1.095	90.9
54	Bay Road/University Avenue	C-	34.5	0.713	36.4	**E**	71.5	1.064	89.9
55	Donohoe Street/University Avenue	D-	51.9	0.896	55	D+	38	0.791	42.9
56	Welch Road/Quarry Road	C+	20.8	0.552	23.9	C+	21.4	0.539	23.1
57	Durand Way/Sand Hill Road	A	6.1	0.315	9.1	A	5.8	0.398	7.7
58	Pasteur Drive NB/Welch Road	A	8.4	0.328	10.1	B+	10.4	0.402	10.8
59	Pasteur Drive SB/Welch Road	B+	10.6	0.351	8.9	A	7.7	0.24	8.2
60	Durand Way Extension/Welch Road	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
61	Bowdoin Street/Stanford Road/(unsignalized)	B	13.5	0.671	13.5	B	11.7	0.536	11.7
62	Alpine Road/I-280 NB Off-Ramp (unsignalized)	**F**	158.1	1.851	158.1	**F**	82.8	1.252	82.8
63	Alpine Road/I-280 SB Off-Ramp (unsignalized)	**F**	80.7	1.124	80.7	C	17.7	0.426	17.7
64	Page Mill/I-280 NB Off-Ramp/(unsignalized)	D	30.9	0.506	30.9	B	11.9	0.146	11.9
65	Page Mill Road/I-280 SB Off-Ramp (unsignalized)	**F**	98	1.309	98	D	30.9	0.984	30.9
66	Foothill Expressway/Arastradero Road	**E**	64.1	0.573	96.1	**E+**	56.9	0.622	73.6

Source: City of Palo Alto, City of Menlo Park and AECOM March 2008.

Note: Shading indicates intersection operating at LOS E or F.

Based on Santa Clara County Congestion Management Program (CMP) Traffic Impact Analysis (TIA) requirements, all intersections operate within satisfactory LOS (LOS D or better) during the AM Peak Hour except for the following five intersections which are shaded in Table 3.4-6:

- Junipero Serra Boulevard-Foothill Expressway/Page Mill Road (LOS F) [intersection #23]
- I-280 NB Off-Ramp/Alpine Road (LOS F) [intersection #62]
- I-280 SB Off-Ramp/Alpine Road (LOS F) [intersection #63]
- Foothill Expressway/Arastradero Road (LOS E) [intersection #66]
- Page Mill Road/I-280 SB Off-Ramp (LOS F) [intersection #65]

During the PM Peak Hour, the following seven intersections operate at unsatisfactory levels of service:

- Junipero Serra Boulevard-Foothill Expressway/Page Mill Rd (LOS F) [intersection #23]
- Galvez Street/Arboretum Road (LOS F) [intersection #37]
- Willow Road/Bayfront Expressway (LOS E) [intersection #52]
- University Avenue/Bayfront Expressway (LOS E) [intersection #53]
- Bay Road/University Avenue (LOS E) [intersection #54]
- I-280 NB Off-Ramp/Alpine Road (LOS F) [intersection #62]
- Foothill Expressway/Arastradero Road (LOS E) [intersection #66]

Residential Roadway Segments. Twenty-four-hour tube counts were taken at each of the study residential roadway segments. The Average Daily Traffic (ADT) for residential roads identified in the study is shown in Table 3.4-7. The volumes shown in the table are for both directions of travel. This table also notes the existing TIRE index. Santa Cruz Avenue, Sharon Road, Hawthorne Avenue, Everett Avenue, and Hamilton Avenue all have indexes above 3.0.

Table 3.4-7
ADT for Residential Roadway Segments

Residential Segment		City/Jurisdiction	ADT	TIRE Index
Santa Cruz Avenue	North of Sand Hill Road	Menlo Park	20,515	**4.3**
Sharon Road	North of Sharon Park Drive	Menlo Park	4,046	**3.6**
Stanford Avenue	North of Sand Hill Road	Menlo Park	158	2.2
Leland Avenue	North of Sand Hill Road	Menlo Park	286	2.5
Vine Street	North of Sand Hill Road	Menlo Park	333	2.5
Hawthorne Avenue	East of Alma Street	Palo Alto	1,703	**3.2**
Everett Avenue	East of Alma Street	Palo Alto	1,366	**3.1**
Hamilton Avenue	Between Chaucer Street and Lincoln Avenue	Palo Alto	2,454	**3.4**

Source: AECOM Transportation, October 2007 and 2009 counts.
Note:
Shaded rows indicates TIRE index greater than 3.0.

Freeway Segments. The Average Annual Daily Traffic (AADT) for freeway segments included in the Study Area is presented in Table 3.4-8. Several segments of US 101 operate at level of service F in one or both peak periods. These include the segments of US 101 north of University Avenue, south of University Avenue; and south of Embarcadero/Oregon Expressway. All segments of I-280 operate at LOS D or better under existing conditions. Existing freeway volumes and level of service were obtained from Caltrans, San Mateo County, and Santa Clara County.

Table 3.4-8
Freeway Segment Level of Service

Freeway Segment	Direction	AADT	LOS (AM)	LOS (PM)
US 101 North of University	NB SB	192,000	**F** **F**	**F** **F**
US 101 South of University	NB SB	200,000	**F** **F**	**F** **F**
US 101 South of Embarcadero/ Oregon Expressway	NB SB	202,000	E D	**F** **F**
I-280 north of Sand Hill Road	NB SB	102,000	D D	D D
I-280 south of Alpine Road	NB SB	103,000	C D	C C
I-280 south of Page Mill Road	NB SB	109,000	D C	C D

Source: Caltrans 2006 Counts, 2007 San Mateo CMP and 2006 Santa Clara CMP.
Note: Shading indicates freeway segments operating at LOS F.

Existing Bicycle and Pedestrian Facilities

Bicycle travel is an important component of the transportation system connecting Menlo Park, Palo Alto, Stanford University, and Mountain View. In 1972, Palo Alto became one of the first communities in California to establish a dedicated bicycle system. Since then, Menlo Park, Palo Alto, and Stanford University have made progress in developing a system of bicycle and pedestrian routes and facilities to accommodate the growing demand for non-motorized travel.

The existing system consists of three classifications of bicycle facilities:[4]

- Class I Bikeway (Bike Path): A bicycle facility that provides a completely separated right of way for the exclusive use of bicycles and pedestrians with cross-flow by motorists minimized.
- Class II Bikeway (Bike Lane): A bicycle facility that provides a striped lane for one-way bicycle travel on a street or highway.
- Class III Bikeway (Bike Route): A bicycle facility that provides for shared use with pedestrian or motor vehicle traffic.

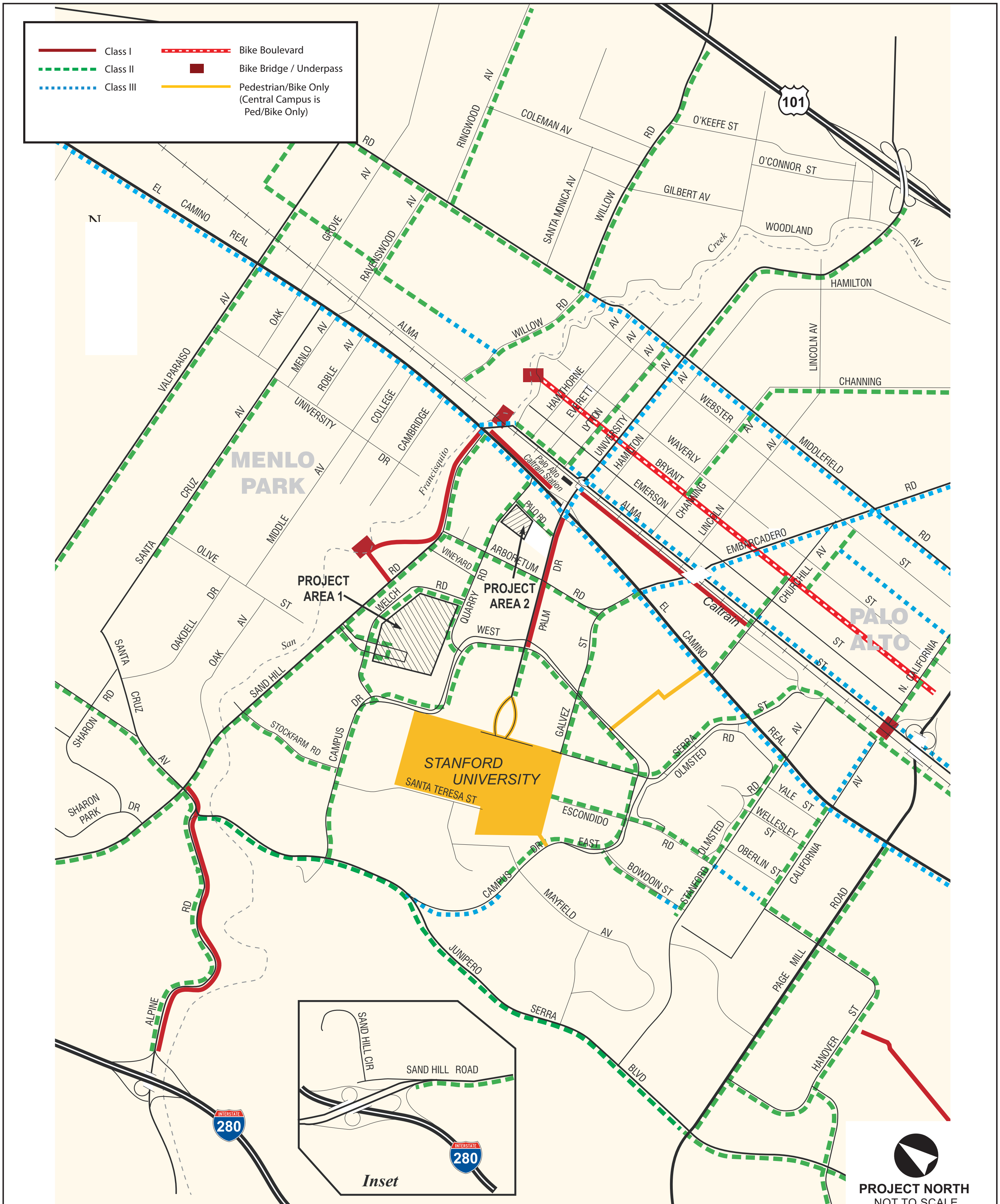
[4] California Department of Transportation (Caltrans). Highway Design Manual. Chapter 1000: Bikeway Planning and Design. June 2006. http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm.

Figure 3.4-2, Figure 3.4-3, and Figure 3.4-4 illustrate the bicycle and pedestrian facilities in the Study Area. There are portions of the Stanford University campus that offer bicycle and pedestrian only access; these facilities are also identified.

Signalized crossings of El Camino Real, which have pedestrian signals to provide safe bicycle and pedestrian crossings, are provided at numerous locations in the Study Area including Ravenswood Avenue, Sand Hill Road, Quarry Road, University Avenue, and Embarcadero Road. Bicycles are legal on all streets in Palo Alto and Menlo Park, except freeways, though there are some major streets with narrow lanes that are not easily shared by bicyclists and motor vehicles.

Both the City of Palo Alto and the City of Menlo Park maintain a system of on- and off-road bicycle lanes, routes and paths. Palo Alto maintains a Bicycle Master Plan and was the first community to develop the bicycle boulevard concept, which is a low-volume through street where bicycles have priority over automobiles. Conflicts between bicycles and automobiles are minimized, and bicycle travel time is reduced by removing stop signs and other impediments to bicycle travel. The bicycle boulevard is located on Bryant Street in Palo Alto. In order to ensure areas of roadways used by bicyclists are maintained at least as well as those used by motorists, the City is adjusting its street evaluation criteria for its Pavement Management Program. In addition, there are several bicycle/pedestrian/transit only routes on the Stanford University campus, such as the Serra Mall. In the City of Menlo Park, a dedicated bicycle path along the south side of the Dumbarton Bridge connects the City with Fremont. The path continues along the south side of Bayfront Expressway to Willow Road which is part of the Study Area. The path runs along the north side of Bayfront Expressway to the Bayfront park entrance at Marsh Road. Nearer to the SUMC Sites, a short Class I bicycle lane and undercrossing extends beneath Alpine Road, adjacent to the Stanford Golf Course which provides an off-street connection to Sand Hill Road.

Pedestrian facilities consist of sidewalks, crosswalks, and many of the facilities for bicycles discussed above. With some exceptions, the regional connections described for bicyclists also exist for pedestrians. For example, pedestrians can use any of the Class I bicycle paths and bridges. Sidewalks are present in most parts of Palo Alto although there are some gaps. There are three pedestrian overcrossings of San Francisquito Creek connecting Menlo Park with Palo Alto: San Mateo Drive, Alma Street, and Willow Place. These facilities provide important off-street connections for both cyclists and pedestrians by avoiding the busy roadway crossings at Middlefield Road and El Camino Real.



Source: AECOM Transportation, 2010.

PBS&J

FIGURE 3.4-2
Existing Bicycle Facilities in Vicinity of SUMC Sites

D41357.00

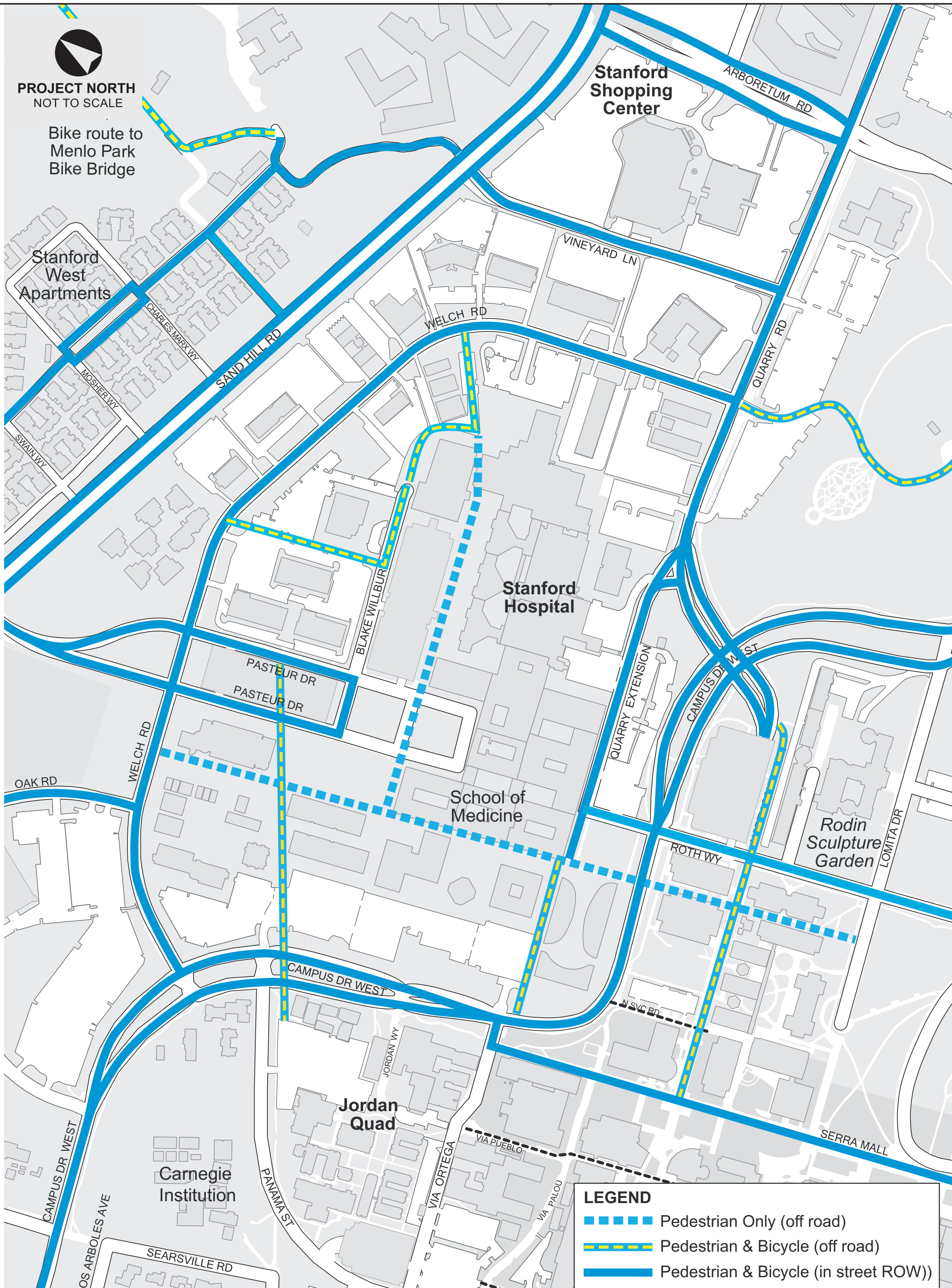
Source: AECOM Transportation, 2010.

PBSJ

FIGURE 3.4-3
Existing Bicycle Facilities in Menlo Park, Near the SUMC Sites

D41357.00

Stanford University Medical Center Facilities Renewal and Replacement Project



Source: AECOM Transportation, 2010.

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FIGURE 3.4-4

Existing Pedestrian Facilities

D41357.00

Stanford University Medical Center Facilities Renewal and Replacement Project

Stanford University provides a comprehensive bicycle and pedestrian circulation system as an alternative to the automobile. The University has several policies and programs intended to discourage the use of autos and encourage the use of alternative travel modes. These policies include:

- Financial incentives such as commuter cash, VTA Eco-Pass,[5] and Caltrain GO Pass;[6]
- Locating academic and residential land uses in close proximity to one another;
- Application of campus design concepts and site development standards that facilitate bicycle and pedestrian use;
- Maintaining and improving the bicycle and pedestrian connections between residential and employment areas; and
- Providing a safe and easily understood system of pedestrian pathways and bicycleways.

Existing Transit Service

The Study Area is currently served by several transit providers, including San Mateo County Transit District (SamTrans), Santa Clara Valley Transportation Authority (VTA), Alameda-Contra Costa Transit District (AC Transit), Stanford University Marguerite shuttle routes, City of Palo Alto shuttle service, City of Menlo Park shuttle service, and Caltrain. Both fixed route bus service and commuter rail service are available within walking distance of the SUMC Sites. Figure 3.4-5 shows the public transit network within the Study Area. The Palo Alto Intermodal Transit Station (PAITS), located near the intersection of El Camino Real and University Avenue, is an intermodal hub served by Santa Clara VTA, SamTrans, Stanford University Marguerite shuttles, AC Transit, and Union City Transit. Other concentrations of bus lines exist at the Stanford Shopping Center, which is located one-quarter of a mile northwest of PAITS.

Bus Service. Bus service in the SUMC Sites is provided by SamTrans, Santa Clara VTA, AC Transit, Stanford University, Palo Alto, and Menlo Park.

SamTrans. SamTrans currently serves PAITS with local lines 280, 281, express route KX, BART/Caltrain connector routes 297 and 390. Connection to the Stanford Shopping Center is provided by local lines 280, 281 and express RX/PX. Three SamTrans bus layover locations are adjacent to the Stanford Shopping Center.

Santa Clara VTA. VTA operates commuter/express and local routes through the Study Area, connecting the City of Palo Alto to other Bay Area cities. VTA serves PAITS with local routes 22 and 35, and the limited-stop Bus Rapid Transit (BRT) route 522. Route 35, in particular, also serves the

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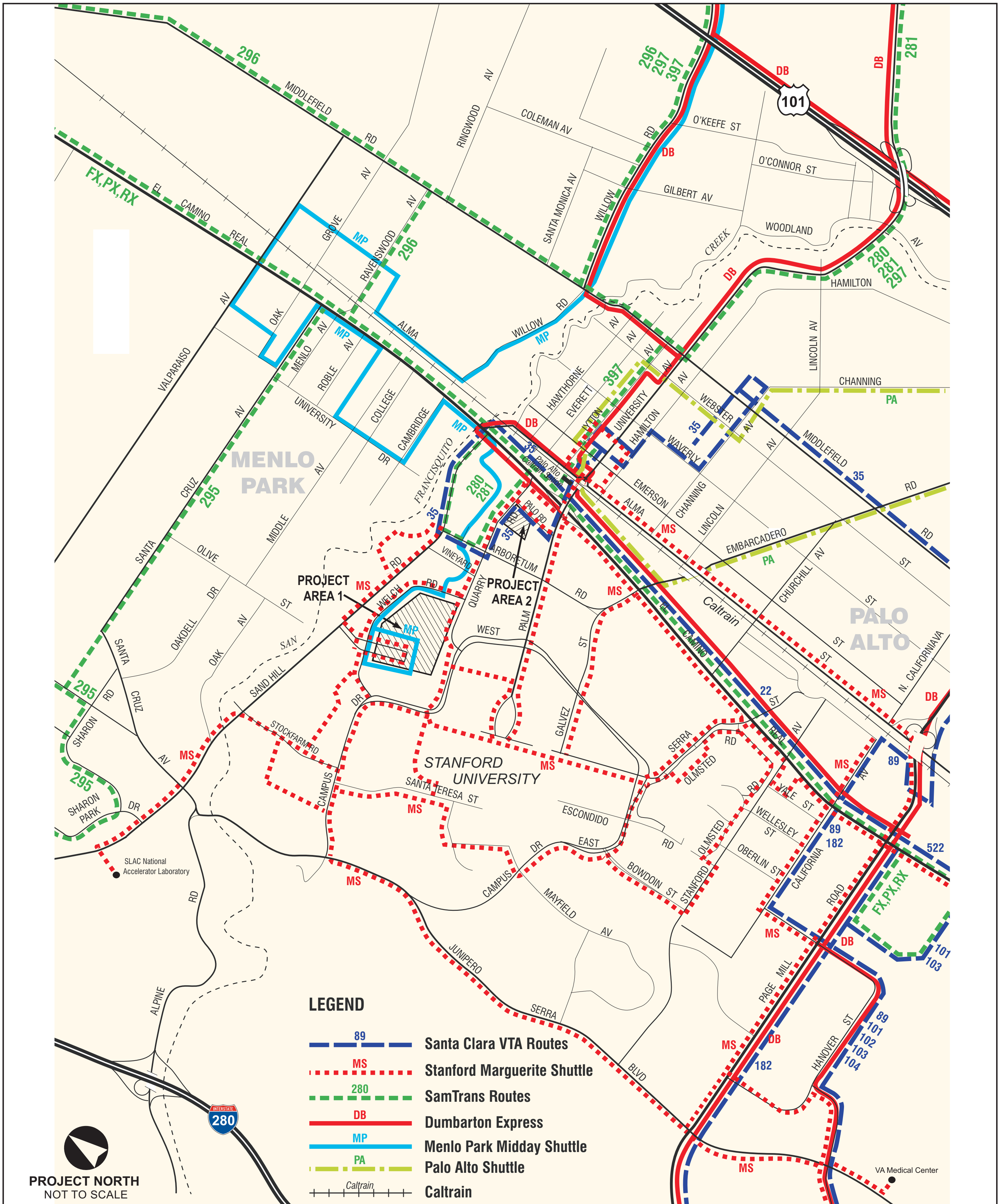
5 The VTA Eco-Pass under SUMC's current TDM program allows unlimited travel on VTA buses (including express services), VTA light rail, Dumbarton Express, Highway 17 Express, and Monterey-San Jose Express.

6 The Caltrain GO Pass is an employer-sponsored annual pass that offers unlimited rides on Caltrain through all Caltrain zones, seven days a week, for one annual cost. Source: http://www.caltrain.com/caltrain_GO_Pass.html, accessed March 16, 2010.



Source: AECOM Transportation, 2010.

PBS&J

FIGURE 3.4-5
Existing Transit Route Network

D41357.00

Stanford Shopping Center. VTA local route 89 provides service between the Palo Alto Veteran's Hospital and the California Avenue Caltrain station.

AC Transit. AC Transit operates the Dumbarton Express, which provides service from the Union City BART station to Palo Alto utilizing the Dumbarton Toll Bridge. It also serves the California Avenue Caltrain Station, North Santa Clara County Offices, the Santa Clara County Municipal Court, and the Stanford Research Park. AC Transit also operates the Stanford U Line bus service from the East Bay and Stanford provides funding for this service. The U Line serves the SUMC.

Stanford University Marguerite Shuttle. Stanford University operates the Marguerite Shuttle, which provides free service to many locations on the main campus and Palo Alto, such as the Medical Center, Stanford Shopping Center, Stanford Linear Accelerator (SLAC), PAITS, California Avenue Caltrain Station and downtown Palo Alto. All of the shuttle lines, except for the Downtown Express are wheelchair accessible. The shuttle operates weekdays from 6:00 a.m. to 8:00 p.m., except during University holidays. Marguerite's A and B lines meet most trains at the PAITS weekdays from 6:00 a.m. to 8:30 p.m. to serve commuters.

Line A connects Escondido Village and Rains student housing to the main campus and Medical Center.

Line B serves Rains and the East Residences, as well as several central campus locations such as Tresidder Memorial Union, Terman Engineering Center, and the Law School. It runs to and from the PAITS by way of Town and Country Village, thereby serving shoppers throughout the day.

Line C serves the California Avenue Caltrain Station, the main campus, Medical Center and the Stanford West Apartments.

The Stanford Linear Accelerator Center (SLAC) shuttle operates Monday through Friday year round (except on campus holidays) between SLAC and Hoover Tower by way of the Oak Creek Apartments located on Sand Hill Road, West Campus Residences, and the Science and Engineering Quad. Service is provided every 20 minutes between 7:30 a.m. to 9:00 p.m.

The SLAC Employee Shuttle operates weekday mornings 6:27 a.m. to 8:15 a.m. and weekday evenings 3:10 p.m. to 5:05 p.m., year round (except campus holidays). Stops include the Stanford West Apartments, PAITS, SLAC Fire Station, Computer Building, and SSRL Gate 17 and the new Rosewood Hotel and office complex.

The Midnight Express is an evening and weekend service that operates from September through June, linking the campus to the Palo Alto Caltrain Station. Shuttle frequency is every 15 to 30 minutes.

The Shopping Express operates daily during the academic year from September through June, linking the SUMC and residential areas of Stanford University to the business districts in Palo Alto (downtown, California Avenue, and Town & Country Village) and Mountain View (San Antonio Shopping Center).

City of Palo Alto Shuttle. The City operates two shuttle routes: the Crosstown Shuttle and the Embarcadero Shuttle. On weekdays, both routes serve the University Avenue Caltrain Station and Palo Alto Transit Center. The Palo Alto Shuttle is free and open to the general public. Bus stops are marked with a "Palo Alto Shuttle" sign, a sticker on a regular VTA bus stop sign, or a shuttle decal on a stop sign pole.

- The Crosstown Shuttle runs every half-hour from 7:00 a.m. to 6:00 p.m. It connects residential neighborhoods, senior residences and services, libraries, recreation centers, commercial districts.
- The Embarcadero Shuttle runs during the morning, noon and evening commute hours at 15-minute intervals. It is coordinated with the Caltrain schedule, serving employers in the East Bayshore area, residents in the Embarcadero Road corridor and students at Palo Alto High School.

City of Menlo Park Midday Shuttle Service. The Midday Shuttle Service is a free community service route open to the general public. It is especially popular with senior citizens. Its key stops include the Menlo Park Library, Belle Haven Library, Menlo Park Senior Center, downtown Menlo Park, Menlo Park Caltrain station, Menlo Medical Clinic, Stanford Shopping Center and SUMC. Hourly service is provided Monday through Friday between 9:30 a.m. and 3:30 p.m. This service is funded by the City of Menlo Park and the Bay Area Air Quality Management District (BAAQMD) Transportation Fund for Clean Air.

Commuter Rail Service. The Peninsula Corridor Joint Powers Board (JPB) rail service, Caltrain, runs along the Peninsula, from San Francisco in the north to San Jose and Gilroy in the south. Caltrain is managed by SamTrans, and operates under the jurisdiction of the JPB. The travel time between San Jose and San Francisco is approximately one hour and 20 minutes.

There are two Caltrain stations serving the Stanford University area, at the Palo Alto Transit Center (east of El Camino Real at University Avenue) and at California Avenue. On weekdays, trains run every 5 to 30 minutes during the morning and afternoon commute hours and hourly during off-peak times. Hours of operation are from 5:01 a.m. to 11:04 p.m. for northbound service and from 5:51 a.m. to 12:57 a.m. for southbound service. Service is also provided on Saturdays. The hours of operation are from 7:31 a.m. to 11:01 p.m. for northbound trains, and from 9:02 a.m. to 1:03 a.m. for southbound trains.

Caltrain's Baby Bullet Express skips several of the stops, such as California Avenue, and is able to travel between San Francisco and San Jose in under an hour. Twenty two train trips are provided during AM and PM Peak Hours.

Existing Parking

A survey[7] of parking conditions at the Stanford University Medical Center was conducted in October of 2008. The survey was conducted during the mid-morning and mid-afternoon time periods. The following are the results of the survey:

- SUMC (including both hospitals and medical offices) currently has approximately 8,900 parking spaces available.
- 190 of the spaces are "on-street" parking spaces.
- Approximately 625 of the spaces are dedicated to the three medical office buildings at 703, 900, and 1101 Welch Road.
- Some of these parking spaces are located in areas and parking structures that serve both SUMC and Stanford University.
- During the survey, about 6,400 spaces were occupied during both the mid-morning and mid-afternoon time periods. Of these, about 4,200 (65 percent) belong to hospital employees and visitors. The survey also noted that the mid-morning period has a higher parking demand compared to the mid-afternoon period. The demand at the dedicated medical office parking area is between 70 percent and 80 percent during the mid-morning peak.

Transportation Demand Management

Transportation demand management (TDM) refers to policies and programs that are designed to reduce the number of vehicle trips that are made, especially during the peak time periods of the day when congestion on roadways is at its worst. It refers to a wide array of measures, from telecommuting programs that allow employees to work from home; to carpool and vanpool programs that encourage two or more people to share their commute to work; to incentives to encourage people to leave their cars at home and instead use public transit, or bicycle or walk to work.

Although a State law was passed in 1995 that prohibits public agencies from requiring mandatory TDM, SHC, LPCH, and the SoM still voluntarily provide TDM programs for their employees. Furthermore, the City has concluded that, notwithstanding this State law, the City nonetheless can effectively require the applicant to include TDM measures in the SUMC Project. Key components of the current TDM program administered by SHC, LPCH, and the SoM are summarized below. The program is designed to reduce "drive-alone" trips by encouraging the use of public transit, walking, and bicycling.

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[7] Fehr and Peers, Stanford University Medical Center Trip Generation and Parking Demand Study, October 2008.

Commute Club:	Incentives or perks for those who choose not to drive to work, e.g.: Up to $282/ year in Clean Air Cash or Carpool Credit Complimentary daily parking passes for carpoolers Online Stanford ride-matching service Commuter Buddy Program Pretax payroll deduction for transit passes, Caltrain parking and commuter checks Rewards for recruiting new members Guaranteed ride home 12 free hourly car rental vouchers Membership appreciate events Entries into regular prize drawings Ability to purchase up to eight daily parking permits per month and have them mailed home Reserved parking spaces for all carpools/vanpools Vanpool subsidies Members-only commuter gifts
Marguerite Shuttle:	Free, comprehensive campus shuttle system, open to the public that connects with local transit and Caltrain. New buses run on biodiesel fuel and real-time schedules can be viewed on the web under the Automated Transportation Management System.
VTA Eco-Pass:	Free to eligible hospital employees, allows unlimited travel on VTA buses (including express services), VTA light rail, Dumbarton Express, Highway 17 Express and Monterey-San Jose Express.
Line U Stanford Express:	Free use of East Bay express bus that connects BART, ACE train and remote park and ride lots (e.g. Ardenwood Farms) to Stanford.
Bicycle Program:	Programs that promote and encourage the safe use of bicycles in and around the campus e.g. bicycle light giveaways, safety education programs, bicycle safety road show, commute planning/cycling information.
Vehicle Rental:	Hourly, half-day and full-day car rental (through on-campus Enterprise Rent-a-Car office) available to faculty, staff and students 18 years and older.
Charter Bus Services:	Group transportation services are provided during events like conferences or student activities to allow for alternative forms of commuting.
Others:	Flexible work options (staggered work hours, compressed work week etc.), alternative transportation promotional events, one-on-one commute planning assistance, etc.

Applicable Plans and Policies

There are no relevant federal or State transportation policies applicable to the implementation of the SUMC Project. Relevant policies in the City's Comprehensive Plan have been listed and analyzed for consistency with the SUMC Project in Section 3.2, Land Use.

City of Palo Alto Municipal Code. The City of Palo Alto's basic parking regulations are described in Title 18 of the Municipal Code.[8]

- **Parking Required.** Off-street parking, loading, and bicycle facilities shall be provided for any new building constructed and for any new use established, for any addition or enlargement of an existing building or use, and for any change in the occupancy of any building or the manner in which any use is conducted that would result in additional spaces being required, subject to the provisions of this chapter.
- **Parking Requirements.** In each district, off-street parking, loading, and bicycle facilities for each use shall be provided in accordance with Table 3.4-9 and Table 3.4-10. The requirement for any use not specifically listed shall be determined by the director on the basis of requirements for similar uses, and on the basis of evidence of actual demand created by similar uses in Palo Alto and elsewhere, and such other traffic engineering or planning data as may be available and appropriate to the establishment of a minimum requirement.

Table 3.4-9
Minimum Off-Street Parking Requirements

	Vehicle Parking Requirement	Bicycle Parking Requirement	
Use	**Spaces**	**Spaces**	**Long Term (LT) and Short Term (ST)**
Hospitals	1 space for each 1.5 patient beds	1 per 15 patient beds	60% – LT 40% – ST
Medical Offices	1 per 250 sq. ft. of gross floor area	1 per 2,500 s f	

Source: City of Palo Alto Municipal Code.

Table 3.4-10
Minimum Off-Street Loading Requirements

Use	Gross Floor Area	Loading Spaces Required
Hospitals	200,000 sq. ft. or greater	3
Medical Offices	10,000 – 99,999 sq. ft	1
	100,000 – 199,999 sq. ft.	2

Source: City of Palo Alto Municipal Code.

8 City of Palo Alto. Zoning Code Chapter 18.52: Parking and Loading Requirements. http://www.cityofpaloalto.org/depts/pln/planning_forms.asp#Zoning%20Code.

- **Adjustments by the Director.** Automobile parking requirements may be adjusted by the Director of Planning and Community Environment in the following instances and in accord with the prescribed limitations in Table 3.4-11, when in his/her opinion such adjustment will be consistent with the purposes of this chapter, will not create undue impact on existing or potential uses adjoining the site or in the general vicinity, and will be commensurate with the reduced parking demand created by the development, including for visitors and accessory facilities where appropriate. No reductions may be granted that would result in provision of less than ten (10) spaces on a site. The following are adjustments that apply to developments not located within a parking assessment district. Adjustments within the parking assessment districts are contained in Section 18.52.080. The decision regarding parking adjustments may be appealed as set forth in Chapter 18.78 (Appeals).

Table 3.4-11
Allowable Parking Adjustments

Purpose of Adjustment	Amount of Adjustment	Maximum Reduction
Transportation and Parking Alternatives	Where effective alternatives to automobile access are provided, other than those listed above, parking requirements may be reduced to an extent commensurate with the permanence, effectiveness, and the demonstrated reduction of off-street parking demand effectuated by such alternative programs. Examples of such programs may include, but are not limited to, transportation demand management (TDM) programs or innovative parking pricing or design solutions.	20 percent of the total spaces required for the site

Source: City of Palo Alto Municipal Code.

Impacts and Mitigation Measures

Standards of Significance

The Study Area encompasses parts of the Cities of Palo Alto, Menlo Park, and East Palo Alto, as well as unincorporated parts of Santa Clara County. Significance criteria for project impacts vary by jurisdiction. For the purposes of this analysis, impacts were determined based on the criteria of the jurisdiction in which the intersection or roadway segment is located, e.g., an intersection located in the City of Palo Alto was evaluated based on City of Palo Alto significance criteria. Additionally:

- City of Palo Alto criteria have been applied for intersections under Santa Clara County and Stanford University control, as Palo Alto's criteria are more stringent.
- City of Menlo Park criteria have been applied for collector and minor arterial roadway segments in Menlo Park.
- Residential roads in Palo Alto and Menlo Park identified for this study have been analyzed using the TIRE Index methodology.

- City of East Palo Alto criteria have been applied for intersections within that jurisdiction.

City of Palo Alto Standards of Significance. Traffic impacts would be considered significant if the SUMC Project would:

- Cause a local (City of Palo Alto) intersection to deteriorate below LOS D;
- Causes a local intersection already operating at LOS E or F to deteriorate in the average control delay for the critical movements by four seconds or more, and the critical V/C ratio value to increase by 0.01 or more;
- Cause a regional intersection to deteriorate from LOS E or better to LOS F;
- Cause a regional intersection already operating at LOS F to deteriorate in the average control delay for the critical movements to increase by four seconds or more, and the critical V/C to increase by 0.01 or more;
- Result in increased traffic volumes at an unsignalized intersection, and meet traffic signal warrants;
- Cause queuing impacts based on a comparison of the demand queue length and the available queue storage capacity for intersections and access points in the immediate vicinity of the project;
- Cause a freeway segment (for each direction of traffic) to operate at LOS F, or contribute traffic in excess of 1 percent of segment capacity to a freeway segment already operating at LOS F;
- Result in increased traffic related hazards to pedestrians and bicyclists as a result of increased congestion;
- Impede the operation of a transit system as a result of a significant increase in ridership;
- Result in inadequate on-site parking supply;
- Create an operational safety hazard;
- Result in inadequate emergency access; or
- Cause any change in traffic that would increase the TIRE index by 0.1 or more on a local or collector residential street.

City of Menlo Park Standards of Significance. The City of Menlo Park considers a project to have a significant impact if it would:

- Cause an intersection on a collector street to operate at LOS D or below or have an increase of 23 seconds or greater in average vehicle delay, whichever comes first;
- Cause an intersection on an arterial street or a local approaches to a State controlled signalized intersection to operate at LOS E or below or have an increase of 23 seconds or greater in average delay, whichever comes first;

- Cause an increase of more than 0.8 seconds of average delay to vehicles on all critical movements for intersection on collector streets operating at LOS D or below or LOS E or below for arterial streets;
- Cause an increase of 0.8 seconds or more of delay to vehicles on any critical movement for intersections on local approaches to State controlled signalized intersections operating at LOS E or below;
- Cause the following impacts on minor arterial streets. If the existing ADT is:
  1) greater than 18,000 (90 percent of capacity), and there is a net increase of 100 trips or more in ADT due to project traffic;
  2) the ADT is greater than 10,000 (50 percent of capacity) but less than 18,000, and the project traffic increases the ADT by 12.5 percent or the ADT becomes 18,000 or more;
  3) the ADT is less than 10,000, and the project traffic increases the ADT by 25 percent;
- Cause the following impacts on collector streets. If the existing ADT is:
  1) greater than 9,000 (90 percent of capacity), and there is a net increase of 50 trips or more in ADT due to project traffic;
  2) the ADT is greater than 5,000 (50 percent of capacity) but less than 9,000 and the project traffic increases the ADT by 12.5 percent or the ADT becomes 9,000 or more;
  3) the ADT is less than 5,000 and the project traffic increases the ADT by 25 percent;
- Cause the following impacts on local streets. If the existing ADT is:
  1) greater than 1,350 (90 percent of capacity), and there is a net increase of 25 trips or more in ADT due to project traffic;
  2) the ADT is greater than 750 (50 percent of capacity) but less than 1,350, and the project traffic increases the ADT by 12.5 percent or the ADT becomes 1,350; or
  3) the ADT is less than 750 and the project traffic increases the ADT by 25 percent.

City of East Palo Alto Standards of Significance. The City of East Palo Alto considers a project to have a significant impact if it would:

- Cause an intersection's operation to deteriorate from an acceptable level (LOS D or better) under background conditions to an unacceptable level (LOS E or LOS F);
- Exacerbate unacceptable operations (LOS E or F) at a signalized intersection by increasing the critical delay by more than four seconds and increasing the V/C ratio by 0.01 or more; or
- Exacerbate the V/C ratio by 0.01 or more at a signalized intersection observed to operate at unacceptable operations, even if the calculated level of service is acceptable.

Future Conditions

This section describes the future year scenarios and how they were analyzed. Although construction of the SUMC Project would be completed by 2021, the SUMC Project would not be fully operational until 2025. Therefore, the traffic impacts that would result from implementation of the SUMC Project were only estimated for post-construction (2025) conditions. The cumulative horizon is also 2025, the same as the project horizon. Therefore, the 2025 with project scenario and the cumulative scenario are one and the same.

Whereas the analysis of the existing traffic conditions is based on existing (2007, 2008, and 2009) traffic count data, the future year analysis is based on traffic forecasts that were developed using the City of Palo Alto Travel Demand Forecasting Model. The key inputs to the model are the estimated growth in commercial and residential development, and the planned and programmed infrastructure improvements (roads, public transit, bicycle, and pedestrian facilities) that would occur between the existing and future years. Based on these assumptions, the model forecasts the amount of vehicular traffic that would use each of the roadway segments, freeway segments, and intersections; the number of passengers that would use the public transit routes; and the number of bicyclists and pedestrians that would use the trails and paths that have been analyzed as part of the Transportation Impact Analysis.

2025 No Project. This scenario includes all of the growth in population and employment that is projected to occur between Existing Conditions and the year 2025. It also includes all of the highway and transit improvements that have dedicated sources of funding that are scheduled to be completed between Existing Conditions and 2025. It does not include the SUMC Project.

Level of Service for Intersections. The future conditions intersection analysis was performed using the same methods as were used to analyze Existing Conditions. The future Peak Hour traffic volumes were used with the future lane configurations and signal phasing (for signalized intersections) as inputs into the LOS calculations to evaluate future operations. Future year intersection lane geometry, traffic control, and turning movement volumes for each of the analyzed intersections, for each analyzed scenario are shown in Appendix C.

The results for 2025 No Project conditions are presented in Table 3.4-12. During the AM Peak Hour, the following 11 intersections would operate at unsatisfactory levels of service. Of these 11 intersections, six would operate at LOS E and five would operate at LOS F in the AM Peak Hour.

- El Camino Real/University Avenue-Palm Drive (LOS E) [intersection #10]
- El Camino Real/Page Mill Road – Oregon Expressway (LOS E) [intersection #16]
- Junipero Serra Boulevard – Foothill Expressway/Page Mill Road (LOS F) [intersection #23]
- Arboretum Road/Galvez Street (LOS E) [intersection #37]
- Alma Street/Charleston Road (LOS E) [intersection #39]

- Donohoe Street/University Avenue (LOS E) [intersection #55]
- Alpine Road/I-280 northbound off-ramp (LOS F) [intersection #62]
- Alpine Road/I-280 southbound off-ramp (LOS F) [intersection #63]
- Page Mill Road/I-280 northbound off-ramp (LOS E) [intersection #64]
- Page Mill Road/I-280 southbound off-ramp (LOS F) [intersection #65]
- Foothill Expressway/Arastradero Road (LOS F) [intersection #66]

During the PM Peak Hour, 15 intersections would operate at unsatisfactory levels of service. Of these 15 intersections, seven would operate at LOS E and eight would operate at LOS F during the PM Peak Hour.

- El Camino Real/Ravenswood Avenue (LOS E) [intersection #3]
- El Camino Real/Embarcadero Road – Galvez Street (LOS E) [intersection #11]
- El Camino Real/Page Mill Road – Oregon Expressway (LOS E) [intersection #16]
- Middlefield Road/Willow Road (LOS E) [intersection #18]
- Junipero Serra Boulevard – Foothill Expressway/Page Mill Road (LOS F) [intersection #23]
- Junipero Serra Boulevard/Campus Drive West (LOS E) [intersection #26]
- Arboretum Road/Galvez Street (LOS F) [intersection #37]
- El Camino Real/Charleston Road (LOS E) [intersection #38]
- Alma Street/Charleston Road (LOS E) [intersection #39]
- Bayfront Expressway/Willow Road (LOS F) [intersection #52]
- Bayfront Expressway/University Avenue (LOS F) [intersection #53]
- Bay Road/University Avenue (LOS F) [intersection #54]
- Alpine Road/I-280 northbound off-ramp (LOS F) [intersection #62]
- Page Mill Road/I-280 southbound off-ramp (LOS F) [intersection #65]
- Foothill Expressway/Arastradero Road (LOS F) [intersection #66]

Table 3.4-12
LOS of Study Intersections for 2025 No Project

		2025 AM				2025 PM			
	Intersection	**LOS**	**Avg Del (sec)**	**Crit V/C**	**Avg Crit Del (sec)**	**LOS**	**Avg Del (sec)**	**Crit V/C**	**Avg Crit Del (sec)**
#1	El Camino Real/Valparaiso Avenue	D	39	0.806	42.7	D-	51.6	0.912	60.8
#2	El Camino Real/Santa Cruz Avenue	B	15.8	0.552	15	C+	21.5	0.614	21.6
#3	El Camino Real/Ravenswood Avenue	D	46.5	0.902	51.6	**E+**	58.9	0.962	76.8
#4	El Camino Real/Roble Avenue	A	9.5	0.535	9	B	12.6	0.528	11.3
#5	El Camino Real/Middle Avenue	C	26.1	0.81	33.1	D	41.6	0.925	46.7
#6	El Camino Real/Cambridge Avenue	B	15.3	0.687	18.6	B	13.9	0.573	20.4
#7	El Camino Real/Sand Hill Road-Alma Street	C	25.5	0.607	35.6	D+	36.7	0.726	45.1
#8	El Camino Real/Quarry Road	B	14.1	0.497	17.9	C+	22.8	0.579	16
#9	Alma Street/Lytton Avenue	B-	18.1	0.628	18.9	D+	38.4	0.975	51.5
#10	El Camino Real/University Avenue-Palm Drive	**E-**	79.5	1.107	98.3	D-	51.6	0.943	61.3
#11	El Camino Real/Embarcadero Road-Galvez Street	D	49.9	0.853	55	**E+**	55.5	0.936	63.3
#12	El Camino Real/Churchill Avenue	C	24.5	0.667	30.8	C	23.1	0.757	34.8
#13	El Camino Real/Serra Street-Park Drive	B-	18.7	0.536	24.5	C	26.5	0.727	31.6
#14	El Camino Real/Stanford Avenue	C	23.8	0.54	17.9	C	27.7	0.733	33
#15	El Camino Real/California Avenue	C	25.8	0.698	28	C	28.1	0.756	29.7
#16	El Camino Real/Page Mill Road-Oregon Expressway	**E**	66.6	1.032	82.9	**E**	67.2	1.038	84.4
#17	Woodland Avenue/University Avenue	D	40.6	0.843	41.4	D-	51.6	0.962	66.7
#18	Middlefield Road/Willow Road	D+	36.4	0.657	40.3	**E**	60.1	0.922	67.6
#19	Middlefield Road/Lytton Avenue	D	41.7	0.874	44.8	D-	54.5	0.955	60.1
#20	Middlefield Road/University Avenue	C	28.7	0.608	31	C-	33.3	0.815	38.5
#21	Middlefield Road/Embarcadero Road	D	41.3	0.666	43.4	D+	38.8	0.672	41.2
#22	Alma Street/Churchill Avenue	C	23.5	0.773	30.1	D+	36	0.93	45.3

Table 3.4-12
LOS of Study Intersections for 2025 No Project

		2025 AM				2025 PM			
	Intersection	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)
#23	Junipero Serra Boulevard-Foothill Expressway/Page Mill Road	**F**	126	1.23	177	**F**	109.2	1.136	151.4
#24	Junipero Serra Boulevard/Stanford Avenue	B	14.2	0.721	20.6	C+	20.6	0.794	25.6
#25	Junipero Serra Boulevard/Campus Drive East	B	14	0.606	19.8	B	13.6	0.618	16.9
#26	Junipero Serra Boulevard/Campus Drive West	D	50.8	0.687	62.3	**E-**	79.8	0.995	103.8
#27	Junipero Serra Boulevard/Alpine Road-Santa Cruz Avenue	D+	36.6	0.902	41.5	D	48.8	0.963	50.7
#28	Sand Hill Cir- I-280/Sand Hill Road	D+	36.9	0.723	31.5	C+	22.4	0.722	25.1
#29	Sharon Park Drive/Sand Hill Road	C	30.7	0.842	29.6	C	27.8	0.892	32.8
#30	Santa Cruz Avenue/Sand Hill Road	D-	52.5	1.067	82.1	D	44.7	0.832	44.8
#31	Oak Avenue/Sand Hill Road -Vine Street	A	9	0.702	10.3	A	9	0.847	11.1
#32	Stock Farm Road/Sand Hill Road	B	17	0.627	19.6	C-	34.4	0.833	42.7
#33	Pasteur Drive/Sand Hill Road	B-	18.5	0.585	20	C	26.8	0.678	31
#34	Arboretum Road/Sand Hill Road	C+	20.5	0.52	23.4	C	30.6	0.689	39.4
#35	Arboretum Road/Quarry Road	C	31.6	0.517	32.3	C	28.8	0.61	31.7
#36	Arboretum Road/Palm Drive	C	24.6	0.856	30.5	C+	21.2	0.744	23.1
#37	Arboretum Road/Galvez Street/(unsignalized)	**E**	38.8	0.772	38.8	**F**	230.5	1.463	230.5
#38	EL Camino Real/Charleston Road	D-	53.1	0.877	55.3	**E**	65.4	0.992	75
#39	Alma Street/Charleston Road	**E+**	55.8	0.965	62	**E-**	76.2	1.055	87.8
#40	Middlefield Road/Charleston Road	D	46.6	0.828	49.4	D	47.5	0.848	51.5
#41	Middlefield Road/Hamilton Avenue	B	17	0.508	17.9	B-	18.7	0.431	19.3
#42	Alma Street/Hamilton Avenue	B	14.3	0.59	16.1	C+	20.6	0.694	22.4
#43	University Drive/Santa Cruz Avenue	C+	22.8	0.612	30	C	29.5	0.718	37.3
#44	El Camino Real/Oak Grove Avenue	C	30.4	0.655	29.2	D+	35	0.745	34
#45	Middlefield Road/Ringwood Avenue	C	30.4	0.704	34	C-	33.8	0.868	43.6

Table 3.4-12
LOS of Study Intersections for 2025 No Project

		2025 AM				2025 PM			
	Intersection	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)
#46	Middlefield Road/Ravenswood Avenue	C	30.6	0.865	41.6	D-	54.1	1.008	73.4
#47	El Camino Real/Encinal Road	C+	20.2	0.658	18	C+	21.3	0.686	23.7
#48	Bay Road/Marsh Road	B	13.3	0.606	14.9	B	12.6	0.537	13.9
#49	Marsh Road/US 101 SB Off-Ramp	B-	19.2	0.812	21.2	C	28.1	0.954	31.3
#50	Marsh Road/US 101 NB Off-Ramp	B	15.1	0.612	16	C+	21.3	0.932	25
#51	Bay Road/Willow Road	B-	18.8	0.648	23	B	17.5	0.619	21.2
#52	Bayfront Expressway/Willow Road	D	42.5	0.969	65.3	**F**	115.6	1.221	147.7
#53	University Avenue/Bayfront Expressway	D	43.5	1.057	86.8	**F**	104.6	1.167	120.8
#54	Bay Road/University Avenue	D+	38.8	0.836	43.7	**F**	96.1	1.166	129.2
#55	Donohoe Street/University Avenue	**E**	73.9	1.018	81.6	D	43	0.899	51.4
#56	Welch Road/Quarry Road	C+	20.9	0.558	24.1	C+	21.4	0.541	23.1
#57	Durand Way/Sand Hill Road	B	12.1	0.662	10.4	B-	19.5	0.617	19.4
#58	Pasteur Drive NB/Welch Road	A	8.8	0.354	10.3	B+	10.5	0.433	10.9
#59	Pasteur Drive SB/Welch Road	B+	10.1	0.31	10.1	A	8.5	0.272	9
#60	Durand Way Extension/Welch Road	C-	32.5	0.732	37.9	C	26.8	0.631	26.4
#61	Bowdoin Street/Stanford Road/(unsignalized)	C	23.5	0.887	23.5	D	31.4	0.921	31.4
#62	Alpine Road/I-280 NB Off-Ramp (unsignalized)	**F**	323.6	2.474	323.6	**F**	205.7	1.789	205.7
#63	Alpine Road/I-280 SB Off-Ramp (unsignalized)	**F**	273.7	1.705	273.7	C	24.7	0.558	24.7
#64	Page Mill Road/I-280 NB Off-Ramp (unsignalized)	**E**	44.6	0.632	44.6	C	16.1	0.276	16.1
#65	Page Mill Road/I-280 SB Off-Ramp	**F**	122.6	1.386	122.6	**F**	100.9	1.497	100.9
#66	Foothill Expressway/Arastradero Road	**F**	105.8	0.743	185	**F**	97	0.811	140

Source: AECOM Transportation, 2009.

Note: Shading indicates intersections operating at LOS E or F.

Level of Service for Roadway Segments. The TIRE index was used to evaluate operating conditions for the residential streets in the City of Palo Alto and Menlo Park. Table 3.4-13 shows the results for these residential streets for the 2025 No Project scenario. Segments of Santa Cruz Avenue and Sharon Road in Menlo Park have a TIRE index above 3. Hawthorne Avenue, Everett Avenue, and Hamilton Avenue in Palo Alto have a TIRE index above 3. However, per the CEQA standards of significance of Menlo Park, impacts on Menlo Park roadways are based on ADT rather than the TIRE index.

Table 3.4-13
2025 No Project Palo Alto Roadway TIRE Index Comparison with Base Scenarios

			No Project (2025 Future Conditions)	
Roadway	**Segment**	**City**	**ADT**	**TIRE Index**
Santa Cruz Avenue	N of Sand Hill Road	MP	25,747	**4.4**
Sharon Road	N of Sharon Park Drive	MP	4,774	**3.7**
Stanford Avenue	N of Sand Hill Road	MP	186	2.3
Leland Avenue	N of Sand Hill Road	MP	337	2.5
Vine Street	N of Sand Hill Road	MP	429	2.6
Hawthorne Avenue	East of Alma Street	PA	2,193	**3.3**
Everett Avenue	East of Alma Street	PA	1,759	**3.2**
Hamilton Avenue	Between Chaucer Street and Lincoln Avenue	PA	3,121	**3.5**

Source: AECOM Transportation, 2010.
Note:
Shaded rows indicate TIRE Index greater than 3.0, which is traffic dominated.

Several larger roadways (minor arterials and collectors) located in the City of Menlo Park were evaluated for SUMC Project impacts, based on ADT. Table 3.4-14 shows the ADT for the identified collectors and minor arterials for the 2025 No Project scenario.

Table 3.4-14
2025 No Project Menlo Park Roadway ADT Analysis

Roadway	**Type**	**Segment**	**No Build**
Marsh Road	Minor Arterial	W of US 101	39,454
Sand Hill Road	Minor Arterial	E of Santa Cruz Avenue	33,407
Willow Road	Minor Arterial	E of Middlefield Road	23,823
	Collector	W of Middlefield Road	6,315
Alpine Road	Minor Arterial	W of Junipero Serra Boulevard	25,120
Middlefield Road	Minor Arterial	N of Ravenswood Avenue	14,359
	Minor Arterial	S of Ravenswood Avenue	25,215
Ravenswood Avenue	Minor Arterial	E of El Camino Real	22,705
Santa Cruz Avenue	Minor Arterial	W of El Camino Real	6,530
Valparaiso Avenue	Minor Arterial	W of El Camino Real	16,239

Source: AECOM Transportation, 2010.

Level of Service for Freeways. Table 3.4-15 presents the 2025 No Project freeway volumes. Future volumes were obtained from the Palo Alto Citywide Travel Demand Model used throughout the Transportation Impact Analysis. The free-flow speed on the freeway is assumed to be the speed limit of 65 mph. By 2025, the operations of US 101 are expected to deteriorate to LOS F during both the AM and PM Peak Hours. Two segments of I-280 are expected to operate at LOS F in the AM Peak Hour, while all segments are expected to operate in the LOS D and E range during the PM Peak Hour.

Table 3.4-15
2025 No Project Freeway Level of Service

		Direction	No. of Mixed Lanes	Peak Period	Volume (pc/hr)	LOS
US 101 Segment						
1	University Avenue to Willow Road	NB	3	AM	6660	**F**
				PM	6000	**F**
2	University Avenue to Willow Road	SB	3	AM	5580	**F**
				PM	4530	**F**
3	University Avenue to Embarcadero /Oregon Expressway	NB	3	AM	5910	**F**
				PM	5540	**F**
4	University Avenue to Embarcadero /Oregon Expressway	SB	3	AM	5170	**F**
				PM	4210	**F**
5	Embarcadero/Oregon Expressway to San Antonio Road	NB	3	AM	7610	**F**
				PM	6030	**F**
6	Embarcadero/Oregon Expressway to San Antonio Road	SB	3	AM	6510	**F**
				PM	5720	**F**
I-280 Segment						
1	Sand Hill Road to Woodside Road	NB	4	AM	6310	D
				PM	8790	E
2	Sand Hill Road to Woodside Road	SB	4	AM	9430	**F**
				PM	6210	D
3	Alpine Road to Page Mill Road	NB	4	AM	7350	D
				PM	8220	D
4	Alpine Road to Page Mill Road	SB	4	AM	8920	E
				PM	7030	D
5	Page Mill Road to El Monte Avenue	NB	4	AM	9660	**F**
				PM	7450	D
6	Page Mill Road to El Monte Avenue	SB	4	AM	7100	D
				PM	8480	E

Source: AECOM Transportation, 2010.
Notes:
HOV lane not included.
Shading indicates freeway segment operating at LOS F.

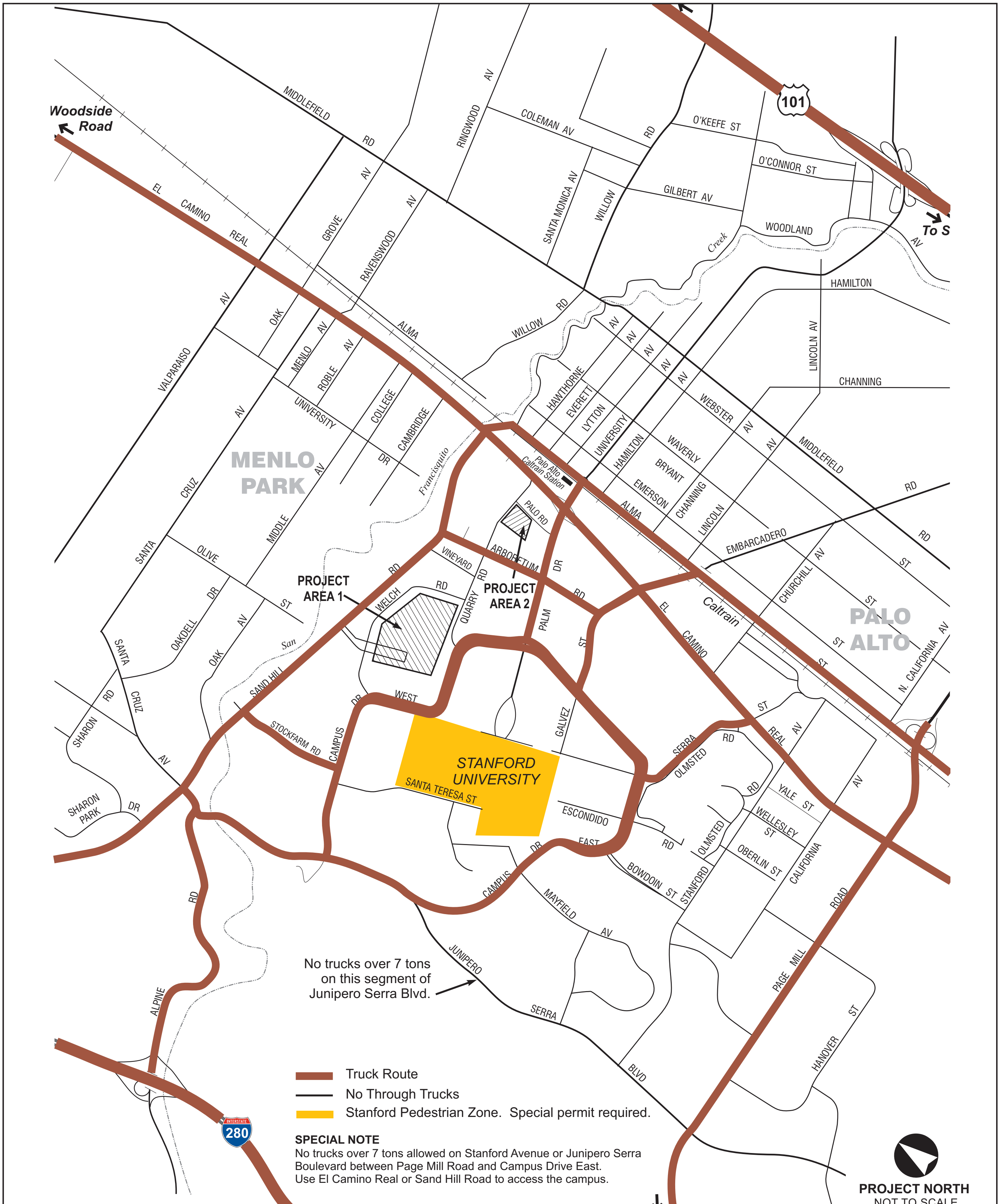
Environmental Analysis

TR-1. Construction Impacts. Construction activity associated with the SUMC Project could result in significant traffic impacts. (S)

Project-related construction traffic could contribute to increased intersection delays and interference with pedestrians, bicyclists, and public transit. Also, construction traffic may create an operational hazard or result in inadequate emergency access. These impacts would be significant, although would be limited to the construction phase of the SUMC Project. During the construction period, impacts might arise from a substantial increase in heavy truck travel, as materials are brought in to the SUMC Sites, and demolished or excavated materials are hauled out. Temporary lane or road closures might be required for construction and for underground utility work. Construction activities would lead to both temporary disruption of transportation system operations and possible damage to elements of the roadway system such as pavement and bridges.

Figure 3.4-6 illustrates the proposed truck routes in the near vicinity of the SUMC Sites and Figure 3.4-7 illustrates the designated truck routes in the City of Menlo Park. The designated truck routes in the City of East Palo Alto are on University Avenue (entire length), Bay Road (from Gloria Way to the eastern city limit), East Bayshore Road (entire length), and West Bayshore Road (from Newell Road to eastern city limit). All truck travel, either for excavation or for transporting construction materials to the SUMC Sites, would use these routes. From I-280 and the west, Alpine Road, Junipero Serra Boulevard, Campus Drive West would be used to reach Welch Road. From the East Bay, trucks would use the Dumbarton Bridge. From US 101, either San Antonio Road or Woodside Road would be used to access El Camino Real. From there, trucks would follow Galvez Street to Arboretum Road, and Sand Hill Road to Pasteur Drive. El Camino Real would be used for short construction-related trips from the north and south.

During the peak of construction, it is anticipated that there would be as many as 2,200 construction workers at the SUMC Sites. The combined construction employment for the expansion would average between 300 and 1,615 workers at a given time. Construction workers would tend to travel to the site from longer distances than average employee trips and would therefore tend to have a higher degree of carpooling with a conservative estimate of 1.5 persons per vehicle. The number of peak hour vehicle trips for the peak of construction workers would average between 200 to 1,075. Most of these trips would occur outside of the peak for traffic on the street. The SUMC Project may include creation of remote parking areas for these workers, with shuttles to bring them to and from SUMC Sites if the remote parking areas are distant from the SUMC Sites. Provision of remote parking for construction activities is identified below as a mitigation measure for construction-related traffic impacts. Construction of the remote parking lots as the first phase of construction would make them available for use by construction workers on the remainder of the SUMC Project.



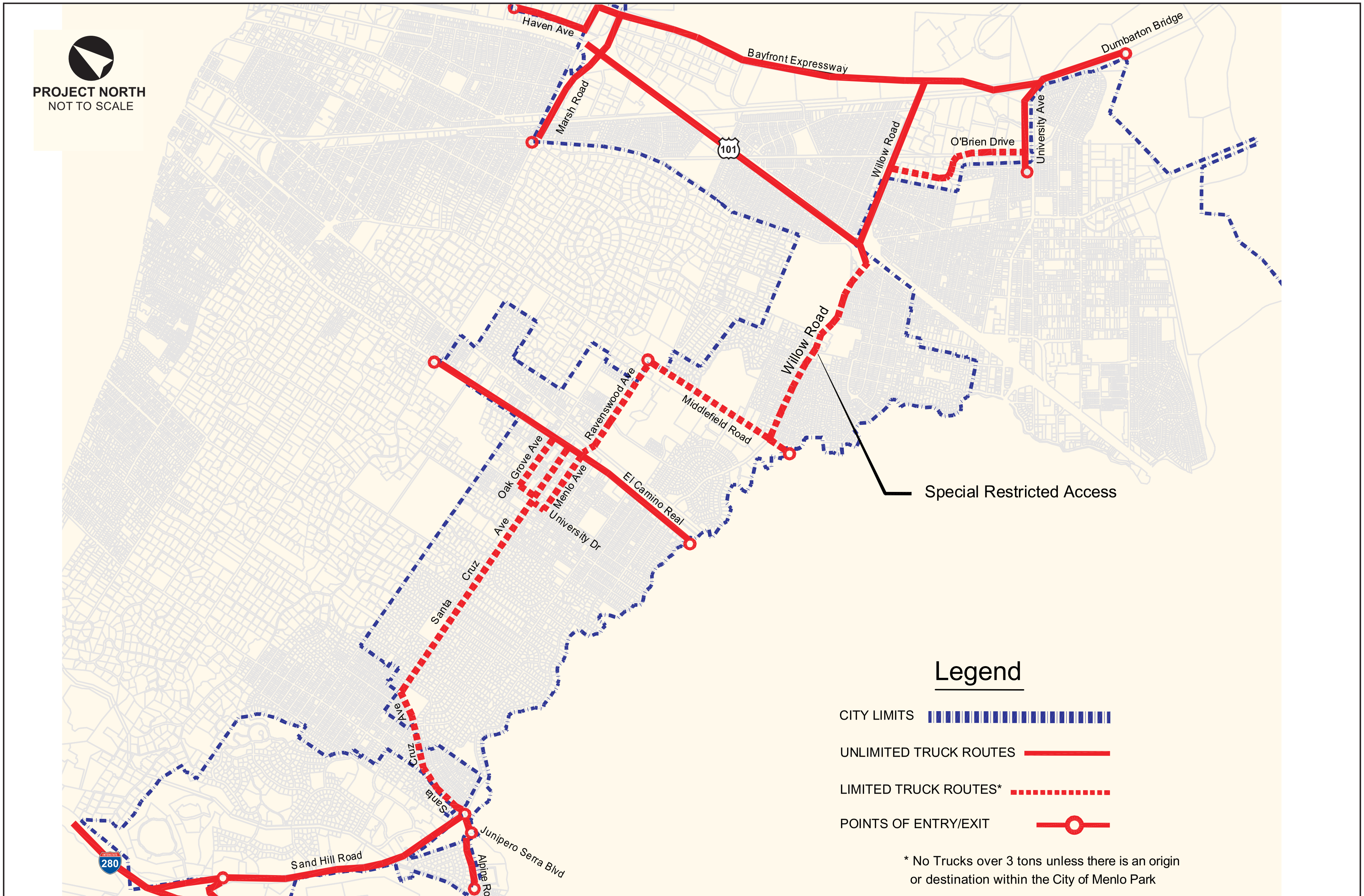
***Source*:** AECOM Transportation, 2010.

FIGURE 3.4-6

Proposed SUMC Project Truck Routes

D41357.00

Stanford University Medical Center Facilities Renewal and Replacement Project



Source: AECOM Transportation, 2008.

PBS&J

FIGURE 3.4-7
Menlo Park Truck Routes

D41357.00

Stanford University Medical Center Facilities Renewal and Replacement Project

The movement of heavy construction equipment such as cranes, bulldozers, and dump trucks to and from the SUMC Sites would be scheduled to occur during off-peak hours and would be required to occur on designated truck routes. Once on-site, heavy construction equipment would generally remain on-site until its use for the job is completed; such equipment would not repeatedly be moved to and from the construction site over public streets.

MITIGATION MEASURES. With implementation of the following mitigation measures, the significant construction related traffic impacts would be reduced to less-than-significant levels. (LTS)

TR-1.1 *Provide Off-Street Parking for Construction Related Vehicles*. The SUMC Project sponsors shall be required to provide adequate off-street parking for all construction-related vehicles throughout the construction period. If adequate parking cannot be provided on the construction sites, a remote parking area shall be designated, and a shuttle bus shall be operated to transfer construction workers to the job site.

TR-1.2 *Maintain Pedestrian Access*. The SUMC Project sponsors shall be prohibited from substantially limiting pedestrian access while constructing the SUMC Project, without prior approval from the City of Palo Alto Department of Public Works. Such approval shall require submittal and approval of specific construction management plans to mitigate the specific impacts to a less-than-significant levels. Pedestrian access-limiting actions would include, but not be limited to, sidewalk closures, bridge closures, crosswalk closures or pedestrian re-routing at intersections, placement of construction-related material within pedestrian pathways or sidewalks, and other actions which may affect the mobility or safety of pedestrians during the construction period. If sidewalks are maintained along the construction site frontage, covered walkways shall be provided.

TR-1.3 *Maintain Bicycle Access*. The SUMC Project sponsors shall be prohibited from limiting bicycle access while constructing the SUMC Project without prior approval from the City of Palo Alto Department of Public Works. Such approval shall require submittal and approval of specific construction management plans that warn cyclists prior to reaching the impacted bicycle lanes and provide alternative routing around the construction sites to mitigate the specific impacts to a less-than-significant level. Bicycle access-limiting actions would include, but not be limited to, bicycle lane closures or narrowing, closing or narrowing of streets that are designated bicycle routes, bridge closures, the placement of construction-related materials within designated bicycle lanes or along bicycle routes, and other actions which may affect the mobility or safety of bicyclists during the construction period.

TR-1.4 *Restrict Construction Hours*. The SUMC Project sponsors shall be required to prohibit or limit the number of construction material deliveries from 7:00 a.m. to 9:00 a.m., and from 4pm to 6pm on weekdays. The SUMC Project sponsors shall be required to prohibit or limit the number of construction employees from arriving or departing the site from the hours of 4:30 p.m. to 6:00 p.m.

TR-1.5 *Restrict Construction Truck Routes.* The SUMC Project sponsors shall be required to deliver and remove all construction-related equipment and materials on truck routes designated by the cities of Palo Alto, East Palo Alto and Menlo Park. Heavy construction vehicles shall be prohibited from accessing the site from other routes. Figure 3.4-6 and 3.4-7 of the EIR illustrates the Stanford Area Truck Routes which must be used by all trucks.

TR-1.6 *Protect Public Roadways During Construction.* The SUMC Project sponsors shall be required to repair any structural damage to public roadways, returning any damaged sections to original structural condition. The SUMC Project sponsors shall survey the condition of the public roadways along truck routes providing access to the proposed project site before construction, and shall again survey after construction is complete. A before-and-after survey report shall be completed and submitted to the City of Palo Alto Public Works Department for review, indicating the location and extent of any damage.

TR-1.7 *Maintain Public Transit Access and Routes.* The SUMC Project sponsors shall be prohibited from limiting access to public transit, and from limiting movement of public transit vehicles, without prior approval from the Santa Clara County Valley Transportation Authority or other appropriate jurisdiction. Such approval shall require submittal and approval of specific impacts to a less-than-significant level. Potential actions which would impact access to transit include, but are not limited to, relocating or removing bus stops, limiting access to bus stops or transfer facilities, or otherwise restricting or constraining public transit operations.

TR-1.8 *Prepare and Implement Construction Impact Mitigation Plan.* In lieu of the above mitigation measures, the SUMC Project sponsors shall submit a detailed construction impact mitigation plan to the City of Palo Alto for approval by the Director of Public Works prior to commencing any construction activities with potential transportation impacts. This plan shall address in detail the activities to be carried out in each construction phase, the potential transportation impacts of each activity, and an acceptable method of reducing or eliminating significant transportation impacts. Details such as the routing and scheduling of materials deliveries, construction employee arrival and departure schedules, employee parking locations, and emergency vehicle access shall be described and approved.

TR-1.9 *Conduct Additional Measures During Special Events.* The SUMC Project sponsors shall implement a mechanism to prevent roadway construction activities from reducing roadway capacity during major athletic events or other special events which attract a substantial number of visitors to the campus. This measure may require a special supplemental permit to be approved by either Santa Clara County or the City of Palo Alto prior to hosting such events during significant construction phases.

TR-2. Intersection Level of Service. Implementation of the SUMC Project would result in significant impacts to intersections during Peak Hour conditions. (S)

Trip Generation. SUMC consists of the Stanford University SoM, SHC and LPCH Hospitals and medical office buildings. As part of the proposed expansion, several existing medical office buildings (119,900 square feet) would be demolished. This demolition was taken into account when calculating the trips generated by the SUMC Project. The Hoover Pavilion would be renovated and square footage (60,000 square feet) would be added to this site for the new medical office building, to a total of 144,230 square feet. In addition, adjustment, or "right-sizing" space credit, was applied to the proposed expansion area for the hospitals to better reflect the facilities' practical use. The hospitals are currently undersized relative to the services they provide. The right-sizing adjustment refers to the part of the proposed expansion that would accommodate the existing uses and would have no impact on the trips generated (see Section 2, Project Description, for a more detailed definition of right-sizing). The proposed expansion of SHC and LPCH that contributes to additionally generated traffic would be 854,970 square feet.[9]

Trip generation rates for the SUMC Project were determined using data collected from existing facilities. Driveway counts were conducted at 20 parking areas serving the SUMC Sites during the AM (7:00-9:00) and PM (4:00-6:00) Peak Hours. Trip generation rates were then calculated based on the traffic volumes and the size of existing buildings. Trips generated for the full build-out (100 percent) of the SUMC Project in 2025 are shown in Table 3.4-16. The Traffic Impact Analysis (Appendix C) contains details of the review and validation of the hospital trip generation statistics. As shown, the SUMC Project would result in 10,061 daily trips, with 766 trips in the AM Peak Hour and 746 trips in the PM Peak Hour.

Table 3.4-16
Trip Generation for Full Buildout of SUMC Project by 2025

		AM Peak Hour			PM Peak Hour		
Land Use	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Hospitals (SHC and LPCH)	9,400	530	171	701	197	496	693
Medical Office Buildings	661	50	15	65	13	40	53
TOTAL INCREASE IN TRIPS	**10,061**	**580**	**186**	**766**	**210**	**536**	**746**

Source: AECOM Transportation, 2010.
Note: There would be no increase in research/laboratory space and operations, and thus no new trip generation.

9 The square footage applied towards calculation of trip generation differs from the square footage identified in Table 2-7 in the Project Description. Square footage applied to trip generation calculations (1) includes only those portions of the hospitals and medical offices at the both the Main SUMC Site and Hoover Pavilion Site that would generate trips, and (2) deducts existing trip-generating uses that would be demolished (at 701, 703, and 1101 Welch Road).

Trip Distribution. After determining the number of trips generated, the trips are distributed and assigned to all study intersections. Distribution is divided into the regional and local patterns to more accurately reflect the origin of trips. SUMC Project trips would be divided into 75 percent regional and 25 percent local. These percentages were derived from existing employees' zip code data. A majority of peak hour traffic would be associated with employee travel. However, some hospital related peak hour travel would be made by patient and visitors. The travel pattern of patients and visitors would be similar to that of employees during the peak hour travel analysis.

As shown in Figure 3.4-8, of the local trips, approximately:

- 16 percent of the local traffic would be from the northwest, the area located north of Sand Hill Road and west of El Camino Real, along Sand Hill Road and Alameda de las Pulgas;

- 15 percent would be from the northeast, along El Camino Real and Middlefield Road;

- 37 percent would be from the east, along University Avenue, Embarcadero Road, and Oregon Expressway;

- 11 percent would be from the southeast, along Alma Street, Charleston Road, and Middlefield Road;

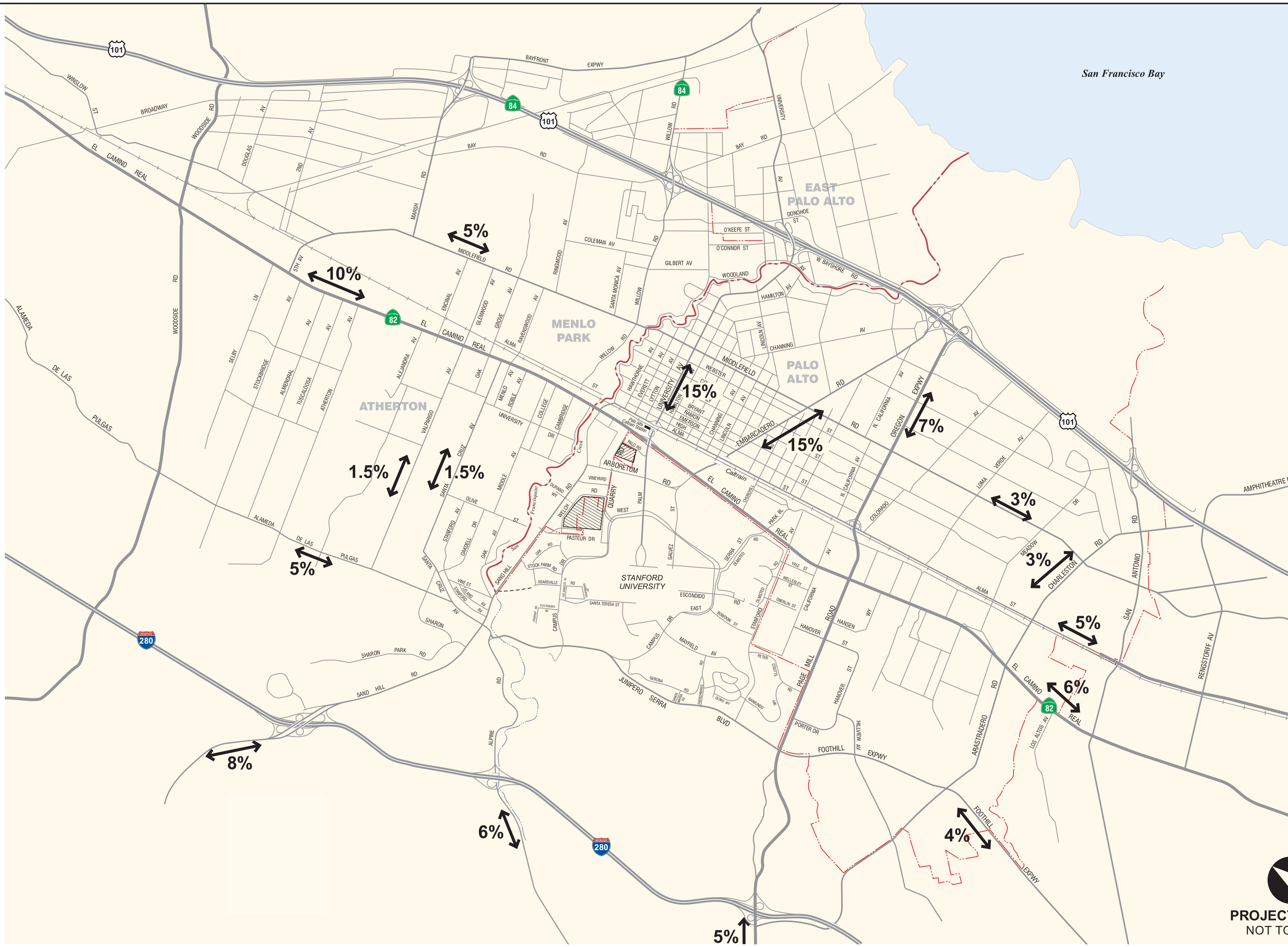
- 10 percent would be from the southwest, along El Camino Real and Foothill Expressway; and

- 11 percent would be from the west, along Alpine Road and Page Mill Road.

As Figure 3.4-9 shows, regional travel to and from the SUMC Project would primarily be via Bayshore Freeway, I-280, El Camino Real, and the Bayfront Expressway.

Improvements to Local Circulation. As discussed in Section 2, Project Description, the SUMC Project would include several improvements to the local circulation network in the immediate vicinity of the SUMC Sites. These improvements include the following:

- *Welch Road.* Welch Road would be modified to improve traffic flow. It would become a three-lane roadway with on-street bicycle lanes. There would be one through lane in each direction (11-foot through lanes), with a two-way left turn lane in the center (12-foot center left turn lane). The bicycle lanes would be six feet wide, including the gutter. Right turns into driveways would occur from the through lanes; however, left turns would be removed from the through lanes. The three pedestrian crossings are proposed to be combined into one or two locations. The main pedestrian crossing at the LPCH access would be signalized. A center barrier median would be constructed between Quarry Road and the entrance to LPCH to prevent left turns to and from the driveways.



Source: AECOM Transportation, 2010.

FIGURE 3.4-8
SUMC Trip Distribution (Local)

D41357.00

Stanford University Medical Center Facilities Renewal and Replacement Project

Source: AECOM Transportation, 2008.

FIGURE 3.4-9
SUMC Trip Distribution (Regional)

D41357.00

Stanford University Medical Center Facilities Renewal and Replacement Project

- *Durand Way*. An extension of existing Durand Way from Sand Hill Road to Welch Road is proposed. The roadway is proposed as a four-lane cross section, with two lanes in each direction and on-street bicycle lanes. Travel lane widths would be 11 feet and the bicycle lanes would be 6 feet wide, including the gutter pan. The intersections of both Sand Hill Road/Durand Way and Welch Road/Durand Way would be signalized.

- *Quarry Road*. The existing Quarry Road extension to Roth Way would be improved, and a new loop driveway would be constructed near the new SHC clinic/medical office buildings to provide enhanced access to the proposed SHC clinic/medical office buildings. Ingress/egress into the SHC clinic underground garage would be off the Quarry Road extension. The Quarry Road improvements would be a two-lane roadway with on-street bicycle lanes. Lane widths would be 11 feet with 6-foot bicycle lanes including the gutter pan. The connection to existing Quarry Road would be stopped controlled for the Quarry Road extension leg.

- *Roth Way*. The existing Quarry Road extension to Roth Way would be improved. This connection would provide access to a proposed parking structure. Roth Way would be a two-lane roadway with on-street bicycle lanes. The travel lanes would be 11 feet and the bicycle lanes 6 feet including the gutter pan.

- *Pasteur Drive*. The two legs of Pasteur Drive currently exist and provide access to the SUMC and to the underground parking garage. On-street parking would be removed from Pasteur Drive and the roadway would provide two lanes of travel in each direction with on-street bicycle lanes. Travel lanes would be 11 feet with 6-foot bicycle lanes, including the gutter.

- *New Service Connection*. A private street connection is proposed between the intersection of Roth Way/Quarry Road Extension and Pasteur Drive. Stanford has indicated that this service road would be for limited access (emergency vehicles, public transit, service deliveries). This roadway would make a connection between Sand Hill Road at Pasteur Drive and Campus Drive West at Roth Way. As such, it would enhance the grid pattern of the local street network. Local circulation could be improved with this roadway opening to all traffic as a public street.

Project Impacts. Based on the level of trips produced by the SUMC Project, and the distribution patterns of these trips, the full buildout of the SUMC Project by 2025 would result in significant impacts at several intersections during AM and PM Peak Hours. These intersections either operate at acceptable LOS levels under 2025 No Project conditions, and with the addition of project traffic, they deteriorate to unacceptable LOS levels; or they already operate at an unacceptable LOS and with the addition of project traffic cause the average control delay for the critical movements to increase by four seconds or more and the volume to capacity ratio (V/C) to increase by 0.1 or more.

As seen in Table 3.4-17, a total of five intersections would be significantly impacted by the SUMC Project during the AM Peak Hour:

- El Camino Real/University Avenue-Palm Drive [intersection #10] – LOS would change from LOS E to F with the average critical delay increasing by 22.6 seconds and the V/C increasing by 0.058. This intersection would be significantly affected by the SUMC Project.
- El Camino Real/Page Mill Road-Oregon Expressway [intersection #16] - LOS would remain at E. The average critical delay would increase by 8.1 seconds and the V/C would increase by 0.026. This intersection would be significantly affected by the SUMC Project.
- Sand Hill Road/Santa Cruz Avenue [intersection #30] – LOS would change from LOS D to E and therefore this intersection would be significantly affected by the SUMC Project.
- Arboretum Road/Galvez Street [intersection #37] (unsignalized) - LOS would remain at E. The City of Palo Alto has not adopted specific criteria for impacts at unsignalized intersections. Therefore, if traffic signal warrants would be met, additional traffic through the intersection would constitute a significant impact. Traffic signal warrants would be met at this intersection, and thus there would be a significant impact at this intersection.
- Alpine Road/I-280 NB Off-Ramp [intersection #62] (unsignalized) - LOS would remain at F. Traffic signal warrants at this intersection are met at baseline conditions as well as with the SUMC Project. There would thus be a significant impact at this intersection.

A total of 12 intersections would be significantly impacted by the SUMC Project during the PM Peak Hour:

- El Camino Real/Ravenswood Avenue [intersection #3] - LOS would remain at E but at least one critical movement for this State-controlled, Menlo Park intersection exceeded 0.8 seconds. This intersection would be significantly affected by the SUMC Project.
- El Camino Real/University Avenue-Palm Drive [intersection #10] – LOS would change from D to E. This intersection would be significantly affected by the SUMC Project.
- El Camino Real/Page Mill Road-Oregon Expressway [intersection #16] - LOS would remain at E. The average critical delay would increase by 5.3 seconds and the V/C ratio would increase by 0.016. This intersection would be significantly affected by the SUMC Project.
- Middlefield Road/Willow Road [intersection #18] LOS would remain at E but the average critical movements would exceed 0.8 seconds for this Menlo Park intersection. This intersection would be significantly affected by the SUMC Project.
- Middlefield Road/Lytton Avenue [intersection #19] - LOS would change from D to E. This intersection would be significantly affected by the SUMC Project.
- Junipero Serra Boulevard/Page Mill Road [intersection #23] - LOS would remain at F. The average critical delay would increase by 6.3 seconds and the V/C ratio would increase by 0.016. This intersection would be significantly affected by the SUMC Project.

Table 3.4-17
LOS Comparison with SUMC Only in 2025 – SUMC Only Project Impact

		2025 AM				2025 AM+SUMC				Compare			2025 PM				2025 PM+SUMC				Compare		
	Intersection	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	Δ Avg Crit Delay	Δ Crit V/C	Impact ?	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	Δ Avg Crit Delay	Δ Crit V/C	Impact ?
#1	ECR/Valparaiso	D	39	0.806	42.7	D	39.4	0.829	43.6	0.9	0.023	N	D-	51.6	0.912	60.8	D-	53.7	0.932	65	4.2	0.02	N
#2	ECR/Santa Cruz	B	15.8	0.552	15	B	15.5	0.579	14.8	-0.2	0.027	N	C+	21.5	0.614	21.6	C+	21.2	0.638	21.4	-0.2	0.024	N
#3	ECR/Ravenswood	D	46.5	0.902	51.6	D	49	0.936	55.9	4.3	0.034	N	**E+**	58.9	0.962	76.8	**E**	62.2	0.969	69.6	-7.2	0.007	**Y**
#4	ECR/Roble	A	9.5	0.535	9	A	9.3	0.557	8.9	-0.1	0.022	N	B	12.6	0.528	11.3	B	12.3	0.549	11.1	-0.2	0.021	N
#5	ECR/Middle	C	26.1	0.81	33.1	C	26.5	0.834	33.7	0.6	0.024	N	D	41.6	0.925	46.7	D	43.5	0.954	50.4	3.7	0.029	N
#6	ECR/Cambridge	B	15.3	0.687	18.6	B	15.5	0.71	18.8	0.2	0.023	N	B	13.9	0.573	20.4	B	12.9	0.566	7.4	-13	-0.007	N
#7	ECR/Sand Hill - Alma	C	25.5	0.607	35.6	C	28.3	0.617	36.2	0.6	0.01	N	D+	36.7	0.726	45.1	D+	38.3	0.754	46.2	1.1	0.028	N
#8	ECR/Quarry Rd	B	14.1	0.497	17.9	B	16.1	0.546	21	3.1	0.049	N	C+	22.8	0.579	16	C	25.7	0.627	15.6	-0.4	0.048	N
#9	Alma/Lytton	B-	18.1	0.628	18.9	B-	19.1	0.668	20.6	1.7	0.04	N	D+	38.4	0.975	51.5	D	43	1.005	59.5	8	0.03	N
#10	ECR/University-Palm (Single Intersection)	**E-**	79.5	1.107	98.3	**F**	95.8	1.165	120.9	22.6	0.058	**Y**	D-	51.6	0.943	61.3	**E**	71	1.017	79.8	18.5	0.074	**Y**
#11	ECR/Embarcadero-Galvez	D	49.9	0.853	55	D-	51.2	0.875	56.9	1.9	0.022	N	E+	55.5	0.936	63.3	E+	57	0.948	65.3	2	0.012	N
#12	ECR/Churchill	C	24.5	0.667	30.8	C	24.7	0.69	31.2	0.4	0.023	N	C	23.1	0.757	34.8	C	23.3	0.769	35.3	0.5	0.012	N
#13	ECR/Serra-Park	B-	18.7	0.536	24.5	B-	18.5	0.542	24.4	-0.1	0.006	N	C	26.5	0.727	31.6	C	26.4	0.743	31.6	0	0.016	N
#14	ECR/Stanford Ave	C	23.8	0.54	17.9	C	23.5	0.557	17.7	-0.2	0.017	N	C	27.7	0.733	33	C	27.6	0.749	33	0	0.016	N
#15	ECR/California	C	25.8	0.698	28	C	25.8	0.716	28.1	0.1	0.018	N	C	28.1	0.756	29.7	C	28.1	0.773	29.8	0.1	0.017	N
#16	ECR/Page Mil-Oregon	**E**	66.6	1.032	82.9	**E**	71.7	1.058	91	8.1	0.026	**Y**	**E**	67.2	1.038	84.4	**E**	70.7	1.054	89.7	5.3	0.016	**Y**
#17	Woodland/University	D	40.6	0.843	41.4	D	40.9	0.858	42.3	0.9	0.015	N	D-	51.6	0.962	66.7	D-	53.4	0.977	69.9	3.2	0.015	N
#18	Middlefield/Willow	D+	36.4	0.657	40.3	D+	37	0.69	41.2	0.9	0.033	N	**E**	60.1	0.922	67.6	**E**	66.8	0.966	76	8.4	0.044	**Y**
#19	Middlefield/Lytton	D	41.7	0.874	44.8	D	47.8	0.904	51.8	7	0.03	N	D-	54.5	0.955	60.1	**E+**	59	0.976	65.7	5.6	0.021	**Y**
#20	Middlefield/University	C	28.7	0.608	31	C	28.9	0.618	31.2	0.2	0.01	N	C-	33.3	0.815	38.5	C-	33.8	0.83	39.5	1	0.015	N
#21	Middlefield/Embarcadero	D	41.3	0.666	43.4	D	41.2	0.679	43.5	0.1	0.013	N	D+	38.8	0.672	41.2	D+	38.7	0.684	41.3	0.1	0.012	N
#22	Alma/Churchill	C	23.5	0.773	30.1	C	23.9	0.787	20.5	-9.6	0.014	N	D+	36	0.93	45.3	D+	37.2	0.94	47.3	2	0.01	N
#23	Junipero Serra Blvd-Foothill Expressway/Page Mill Rd	F	126	1.23	177	F	127.5	1.236	180	3	0.006	N	**F**	109.2	1.136	151.4	**F**	112.9	1.152	157.7	6.3	0.016	**Y**
#24	Junipero/Stanford	B	14.2	0.721	20.6	B	14.8	0.752	21.7	1.1	0.031	N	C+	20.6	0.794	25.6	C+	21.5	0.805	26.3	0.7	0.011	N

Table 3.4-17
LOS Comparison with SUMC Only in 2025 – SUMC Only Project Impact

	Intersection	2025 AM				2025 AM+SUMC				Compare			2025 PM				2025 PM+SUMC				Compare		
		LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	Δ Avg Crit Delay	Δ Crit V/C	Impact ?	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	LOS	Avg Del (sec)	Crit V/C	Avg Crit Del (sec)	Δ Avg Crit Delay	Δ Crit V/C	Impact ?
#25	Junipero/Campus East	B	14	0.606	19.8	B	14.7	0.636	21.1	1.3	0.03	N	B	13.6	0.618	16.9	B	13.8	0.628	17	0.1	0.01	N
#26	Junipero/Campus West	D	50.8	0.687	62.3	D-	54.5	0.697	62.9	0.6	0.01	N	**E-**	79.8	0.995	103.8	**F**	83.9	1.005	108.2	4.4	0.01	**Y**
#27	Junipero/Alpine-Santa Cruz	D+	36.6	0.902	41.5	D+	38	0.915	43.2	1.7	0.013	N	D	48.8	0.963	50.7	D-	51.6	0.978	53.8	3.1	0.015	N
#28	Sand Hill Cir I-280/Sand Hill	D+	36.9	0.723	31.5	D+	38.6	0.744	33	1.5	0.021	N	C+	22.4	0.722	25.1	C+	22.7	0.743	25.6	0.5	0.021	N
#29	Sharon Park/Sand Hill	C	30.7	0.842	29.6	C	31.3	0.863	30.7	1.1	0.021	N	C	27.8	0.892	32.8	C	28.9	0.912	34.4	1.6	0.02	N
#30	Santa Cruz/Sand Hill	D-	52.5	1.067	82.1	**E**	61.8	1.12	101.1	19	0.053	**Y**	D	44.7	0.832	44.8	D	46	0.853	46.1	1.3	0.021	N
#31	Oak/Sand Hill	A	9	0.702	10.3	A	9.2	0.735	10.6	0.3	0.033	N	A	9	0.847	11.1	A	10	0.878	12.6	1.5	0.031	N
#32	Stock Farm/Sand Hill	B	17	0.627	19.6	B	17.4	0.652	20.3	0.7	0.025	N	C-	34.4	0.833	42.7	D	41.7	0.868	53.8	11.1	0.035	N
#33	Pasteur/Sand Hill	B-	18.5	0.585	20	C+	20.7	0.631	23.3	3.3	0.046	N	C	26.8	0.678	31	C	29.3	0.698	34.4	3.4	0.02	N
#34	Arboretum/Sand Hill	C+	20.5	0.52	23.4	C+	22.2	0.591	26.1	2.7	0.071	N	C	30.6	0.689	39.4	C-	34	0.716	45.1	5.7	0.027	N
#35	Arboretum/Quarry	C	31.6	0.517	32.3	C-	33	0.589	33.8	1.5	0.072	N	C	28.8	0.61	31.7	C	29.2	0.657	33.3	1.6	0.047	N
#36	Arboretum/Palm	C	24.6	0.856	30.5	C	28.7	0.907	37.4	6.9	0.051	N	C+	21.2	0.744	23.1	C+	22.2	0.766	24.3	1.2	0.022	N
#37	Arboretum/Galvez	**E**	38.8	0.772	38.8	**E**	45.4	0.819	45.4	6.6	0.047	**Y**	**F**	230.5	1.463	230.5	**F**	263.1	1.543	263.1	32.6	0.08	**Y**
#38	ECR/Charleston	D-	53.1	0.877	55.3	D-	53.7	0.889	56.3	1	0.012	N	E	65.4	0.992	75	E	66.7	0.999	76.7	1.7	0.007	N
#39	Alma/Charleston	E+	55.8	0.965	62	E+	57.7	0.976	64.6	2.6	0.011	N	E-	76.2	1.055	87.8	E-	78.8	1.065	91.3	3.5	0.01	N
#40	Middlefield/Charleston	D	46.6	0.828	49.4	D	46.7	0.83	49.5	0.1	0.002	N	D	47.5	0.848	51.5	D	47.7	0.85	51.7	0.2	0.002	N
#41	Middlefield/Hamilton	B	17	0.508	17.9	B	17.9	0.532	19	1.1	0.024	N	B-	18.7	0.431	19.3	B-	19.2	0.453	19.8	0.5	0.022	N
#42	Alma/Hamilton	B	14.3	0.59	16.1	B	15.6	0.618	17.5	1.4	0.028	N	C+	20.6	0.694	22.4	C+	21.1	0.703	22.8	0.4	0.009	N
#43	University/Santa Cruz	C+	22.8	0.612	30	C	23	0.617	30.2	0.2	0.005	N	C	29.5	0.718	37.3	C	29.6	0.723	37.5	0.2	0.005	N
#44	ECR/Oak Grove	C	30.4	0.655	29.2	C	30.3	0.683	29.1	-0.1	0.028	N	D+	35	0.745	34	D+	35.1	0.771	34.4	0.4	0.026	N
#45	Middlefield/Ringwood	C	30.4	0.704	34	C	30.4	0.707	34.1	0.1	0.003	N	C-	33.8	0.868	43.6	C-	33.9	0.87	43.9	0.3	0.002	N
#46	Middlefield/Ravenswood	C	30.6	0.865	41.6	C-	32.1	0.88	43.5	1.9	0.015	N	D-	54.1	1.008	73.4	**E+**	57.1	1.022	77.2	3.8	0.014	**Y**
#47	ECR/Encinal	C+	20.2	0.658	18	C+	20.1	0.68	18.1	0.1	0.022	N	C+	21.3	0.686	23.7	C+	21.1	0.706	23.7	0	0.02	N
#48	Bay/Marsh	B	13.3	0.606	14.9	B	13.3	0.614	14.9	0	0.008	N	B	12.6	0.537	13.9	B	12.6	0.545	13.9	0	0.008	N
#49	US 101SB/Marsh	B-	19.2	0.812	21.2	B-	19.3	0.814	21.2	0	0.002	N	C	28.1	0.954	31.3	C	28.8	0.962	32.7	1.4	0.008	N
#50	US 101NB/Marsh	B	15.1	0.612	16	B	15.1	0.612	16	0	0	N	C+	21.3	0.932	25	C+	21.3	0.932	25	0	0	N

Table 3.4-17
LOS Comparison with SUMC Only in 2025 – SUMC Only Project Impact

#	Intersection	2025 AM LOS	2025 AM Avg Del (sec)	2025 AM Crit V/C	2025 AM Avg Crit Del (sec)	2025 AM+SUMC LOS	2025 AM+SUMC Avg Del (sec)	2025 AM+SUMC Crit V/C	2025 AM+SUMC Avg Crit Del (sec)	Compare Δ Avg Crit Delay	Compare Δ Crit V/C	Compare Impact ?	2025 PM LOS	2025 PM Avg Del (sec)	2025 PM Crit V/C	2025 PM Avg Crit Del (sec)	2025 PM+SUMC LOS	2025 PM+SUMC Avg Del (sec)	2025 PM+SUMC Crit V/C	2025 PM+SUMC Avg Crit Del (sec)	Compare Δ Avg Crit Delay	Compare Δ Crit V/C	Compare Impact ?
#51	Bay/Willow	B-	18.8	0.648	23	B-	18.6	0.666	23	0	0.018	N	B	17.5	0.619	21.2	B	17.8	0.67	16.8	-4.4	0.051	N
#52	Bayfront Expressway/Willow	D	42.5	0.969	65.3	D	43.6	0.981	67.9	2.6	0.012	N	**F**	115.6	1.221	147.7	**F**	119.2	1.232	152.3	4.6	0.011	**Y**
#53	Bayfront Expressway/University	D	43.5	1.057	86.8	D	44.6	1.064	89.3	2.5	0.007	N	**F**	104.6	1.167	120.8	**F**	107.7	1.176	124.5	3.7	0.009	**Y**
#54	Bay/University	D+	38.8	0.836	43.7	D+	38.9	0.84	43.9	0.2	0.004	N	F	96.1	1.166	129.2	F	97.1	1.17	130.6	1.4	0.004	N
#55	Donohoe/University	E	73.9	1.018	81.6	E	74.9	1.022	82.9	1.3	0.004	N	D	43	0.899	51.4	D	43	0.899	51.4	0	0	N
#56	Welch/Quarry	C+	20.9	0.558	24.1	C	24.1	0.645	29.4	5.3	0.087	N	C+	21.4	0.541	23.1	C	25.1	0.614	30	6.9	0.073	N
#57	Durand/Sand Hill	B	12.1	0.662	10.4	B	13.4	0.698	12.5	2.1	0.036	N	B-	19.5	0.617	19.4	C+	20.1	0.648	20.2	0.8	0.031	N
#58	Pasteur NB/Welch	A	8.8	0.354	10.3	A	8.9	0.385	10.4	0.1	0.031	N	B+	10.5	0.433	10.9	B+	10.7	0.464	10.9	0	0.031	N
#59	Pasteur SB/Welch	B+	10.1	0.31	10.1	B+	10.3	0.363	10.4	0.3	0.053	N	A	8.5	0.272	9	A	8.7	0.303	9.2	0.2	0.031	N
#60	Durand/Welch	C-	32.5	0.732	37.9	D+	37.6	0.772	45.9	8	0.04	N	C	26.8	0.631	26.4	C	28.7	0.66	27.9	1.5	0.029	N
#61	Bowdoin St/Stanford Ave	C	23.5	0.887	23.5	C	23.7	0.889	23.7	0.2	0.002	N	D	31.4	0.921	31.4	D	31.8	0.923	31.8	0.4	0.002	N
#62	I-280 NB Off-Ramp/Alpine Road	**F**	323.6	2.474	323.6	**F**	335.5	2.524	335.5	11.9	0.05	**Y**	F	205.7	1.789	205.7	F	215.8	1.83	215.8	10.1	0.041	**Y**
#63	I-280 SB Off-Ramp/Alpine Road	F	273.7	1.705	273.7	F	277.3	1.719	277.3	3.6	0.014	N	C	24.7	0.558	24.7	D	25.1	0.563	25.1	0.4	0.005	N
#64	Page Mill/I-280 NB Off-Ramp/ (unsignalized)	E	44.6	0.632	44.6	E	45.5	0.639	45.5	0.9	0.007	N	C	16.1	0.276	16.1	C	16.1	0.276	16.1	0	0	N
#65	Page Mill Road/I-280 SB Off-Ramp (unsignalized)	F	122.6	1.386	122.6	F	123.5	1.387	123.5	0.9	0.001	N	F	100.9	1.497	100.9	F	101.9	1.503	101.9	1	0.006	N
#66	Foothill Expressway/ Arastradero Road	F	105.8	0.743	185	F	105.1	0.745	184.2	-0.8	0.002	N	F	97	0.811	140	F	96.7	0.814	139.5	-0.5	0.003	N

Source: AECOM Transportation, 2010.

Note: Shading indicates significant impacts.

- Junipero Serra Boulevard/Campus Drive West [intersection #26] - LOS would change from E to F. The average critical delay would increased by 4.4 seconds and the V/C ratio would increase by 0.01. This intersection would be significantly affected by the SUMC Project.
- Arboretum Road/Galvez Street [intersection #37] (unsignalized) - LOS would remain at F. Traffic signal warrants would be met at this intersection. This intersection would thus be significantly affected by the SUMC Project.
- Middlefield Road/Ravenswood Avenue [intersection #46] - LOS would change from D to E. This intersection would be significantly affected by the SUMC Project.
- Bayfront Expressway/Willow Road [intersection #52] - LOS would remain at F but at least one critical movement for this State-controlled, Menlo Park intersection would exceed 0.8 seconds. This intersection would be significantly affected by the SUMC Project.
- Bayfront Expressway/University Avenue [intersection #53] - LOS would remains at F but at least one critical movement for this State-controlled, Menlo Park intersection would exceed 0.8 seconds. This intersection would be significantly affected by the SUMC Project.
- Alpine Road/I-280 NB Off-Ramp [intersection #62] (unsignalized) - LOS would remain at F. Traffic signal warrants at this intersection are met at baseline conditions as well as with the SUMC Project. This intersection would be significantly affected by the SUMC Project.

MITIGATION MEASURES. Given the magnitude of the SUMC Project's intersection impacts, there is no single feasible mitigation measure that can reduce the impacts to a less-than-significant level. However, there are a range of measures that, when taken individually, would each contribute to a partial reduction in the SUMC Project's impacts. When combined, these measures could result in a substantial reduction in the SUMC Project's impacts.

A set of five different mitigation measures were identified in the Transportation Impact Analysis. Each measure was then prioritized, the highest priority measure being the most preferable solution, and the lowest priority measure being the least preferable. The following are the five mitigation measures, ranked according to priority:

- Priority 1 mitigation measure – Traffic-adaptive signal technology
- Priority 2 mitigation measure – Additional bicycle and pedestrian undercrossings
- Priority 3 mitigation measure – Enhanced transportation demand management (TDM) program
- Priority 4 mitigation measure – Intersection improvements
- Priority 5 mitigation measure – Remote employee parking lots near freeway interchanges

Several of the Priority 4 mitigation measures would require the acquisition of additional right-of-way, and the construction of additional turn lanes. However, the City of Palo Alto has a stated policy which advocates a multi-modal approach to addressing traffic congestion as opposed to approaches that require an increase in roadway capacity. The City of Menlo Park is also trying to encourage commuters to use alternative modes of travel to the automobile. For these reasons, several of the Priority 4 measures are considered to be infeasible. Only those intersection improvements that are considered to be feasible were included in the analysis of the SUMC Project's impacts.

The Priority 3 and Priority 5 measures would be alternatives to each other, both aimed at reducing the traffic impacts of the same target population, SUMC's longer distance commuters. They are viewed as "either or" measures, and would not be implemented together. The remote parking lot mitigation measure (Priority 5) was developed as an alternative to the enhanced TDM program. The discussion and analysis of this mitigation measure is included in Appendix D.

The Priority 1 mitigation measure was analyzed first to determine to what extent it ameliorated the SUMC Project's impacts by itself. The Priority 1 mitigation measure was then combined with other lower priority mitigation measures to determine the combined impact reduction. The following combinations of mitigation measures are analyzed below:

- Priority 1 + Priority 2
- Priority 1 + Priority 2 + Priority 3
- Priority 1 + Priority 2 + Priority 3 + Priority 4

Traffic Adaptive Signal Technology. Traffic-adaptive signals were first implemented in Palo Alto along the Charleston-Arastradero corridor. This technology reduces overall intersection delay by sensing traffic movements as they approach the intersection and adjusting the signal indications to serve those vehicles. The City estimates that overall intersection delay can be reduced by up to 12 percent with the installation of traffic-adaptive signal technology. Mitigation Measure TR-2.1 requires Stanford University to make a fair-share financial contribution towards the implementation of traffic adaptive signals.

The City has identified the following corridors for the implementation of traffic-adaptive signal technology:

- Sand Hill Road (Oak Creek to Shopping Center) - 4 signals
- Arboretum Road (Shopping Center to Palm Drive) - 3 signals
- Embarcadero Road (Bryant to Saint Francis) - 7 signals
- University Avenue (Palm to Lincoln) - 13 signals
- Lytton Avenue (Alma to Middlefield) - 10 signals
- Hamilton Avenue (Alma to Middlefield) - 10 signals

- Middlefield Road (San Antonio to Homer) - 9 signals
- Charleston Road (Alma to Middlefield) - 2 signals
- El Camino Real (northern city limits of Menlo Park to southern city limits of Palo Alto) – signals would require approval of Caltrans

In the AM Peak Hour, the intersection of El Camino Real/Page Mill Road-Oregon Expressway (intersection #16) would no longer be impacted with the implementation of traffic adaptive signal technology. However, the following four intersections would remain significantly impacted.

- El Camino Real/University Avenue – Palm Drive [intersection #10]
- Santa Cruz Avenue/Sand Hill Road [intersection #30]
- Arboretum Road/Galvez Street [intersection #37]
- Alpine Road/I-280 northbound off-ramp [intersection #62]

In the PM Peak Hour, implementation of traffic adaptive signal technology would alleviate impacts at the following three intersections.

- El Camino Real/Ravenswood Avenue [intersection #3]
- El Camino Real/Page Mill Road-Oregon Expressway [intersection #16]
- Middlefield Road/Lytton Avenue [intersection #19]

However, the following nine intersections would remain significantly impacted.

- El Camino Real/University Avenue-Palm Drive [intersection #10]
- Middlefield Road/Willow Road [intersection #18]
- Junipero Serra Boulevard – Foothill Expressway/Page Mill Road [intersection #23]
- Junipero Serra Boulevard/Campus Drive West [intersection #26]
- Arboretum Road/Galvez Street [intersection #37]
- Middlefield Road/Ravenswood Avenue [intersection #46]
- Bayfront Expressway/Willow Road [intersection #52]
- University Avenue/Bayfront Expressway [intersection #53]
- Alpine Road/I-280 northbound off-ramp [intersection #62]

New Bicycle and Pedestrian Undercrossings. In addition to the existing undercrossings at University Avenue and Homer Avenue, two new bicycle and pedestrian undercrossings would be constructed in the Study Area in the future. One would be near Everett Avenue in Palo Alto and the other would be near Middle Avenue in Menlo Park. These additional undercrossings north of University Avenue would facilitate walking and bicycling from residential and commercial areas in north Palo Alto and south Menlo Park. Mitigation Measure TR-2.2 requires Stanford University to make a fair-share financial contribution towards the construction of the Everett Avenue and Middle Avenue undercrossings.

Based on the traffic distribution percentages that are based on SUMC employee zip codes, the number of existing employees living in the vicinity of the four bicycle and pedestrian undercrossings for SUMC would be approximately 625. Based on a mode split of six percent, 37 existing SUMC employees would bike or walk to the SUMC Sites. The existing mode split of 3.1 percent to bicycle and walk for hospital employees would be doubled (to six percent) to account for two existing undercrossings increasing to four. In the future, if the percentage would double to 12 percent, the number of existing employees who walk or bike to the SUMC Sites would be 75.

The number of new SUMC Project employees in 2025 would be 2,311.[10] The number of employees coming from the vicinity of the four undercrossings would be 173 in 2025. Based on the future mode split (12 percent), the number of new SUMC Project employees who would use these facilities would be 21 in 2025. Up to 96 employees, in total, from the SUMC would use the four bicycle and pedestrian undercrossings in the Study Area in 2025, when the SUMC Project would be at its full buildout. Consequently, the overall reduction of SUMC Project vehicular traffic trips during the AM/PM Peak Hour would be 23 trips in 2025.

In addition to the existing and future SUMC traffic that can be reduced by the added undercrossings, existing and future traffic to and from the larger University would also benefit from the added undercrossings. The Peak Hour reduction in 2025 for hospital traffic calculated above represents about three percent of the total SUMC Project traffic. A similar adjustment has been applied to non-project traffic using the adjacent street network to gauge the true benefit of the new undercrossings.

In the AM Peak Hour, combining bicycle and pedestrian undercrossings (Mitigation Measure TR-2.2) with traffic adaptive signal technology (Mitigation Measure TR-2.1) would reduce the SUMC Project's impacts at one additional intersection. In addition to the intersection of El Camino Real and Page Mill Road – Oregon Expressway, the intersection of El Camino Real and University Avenue – Palm Drive would also no longer be impacted.

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10 For the purposes of determining usage of bicycle and pedestrian undercrossings, a slightly higher number of employees (2,311) are used than is shown in Section 2, the Project Description (2,242 employees). As a result, this analysis provides a conservative usage of bicycle and pedestrian undercrossings. Employment used here is based on the following memorandum: Fehr & Peers Transportation Consultants, Analysis of GO Pass Program for Hospital Employees, September 22, 2008, pp. 9-10. See Appendix H to the Transportation Impact Analysis.

However, the following three intersections would remain significantly impacted:

- Santa Cruz Avenue/Sand Hill Road [intersection #30]
- Arboretum Road/Galvez Street [intersection #37]
- Alpine Road/I-280 northbound off-ramp [intersection #62]

In the PM Peak Hour, combining bicycle and pedestrian undercrossings with traffic adaptive signal technology would not result in any change in the number of intersections adversely impacted by the SUMC Project. As with the implementation of traffic adaptive signal technology by itself, implementation of the combination of traffic adaptive signal technology and bicycle and pedestrian undercrossings would alleviate impacts at the following three intersections:

- El Camino Real/Ravenswood Avenue [intersection #3]
- El Camino Real/Page Mill Road-Oregon Expressway [intersection #16]
- Middlefield Road/Lytton Avenue [intersection #19]

The same nine intersections would remain significantly impacted even with implementation of both traffic adaptive technology (Mitigation Measure TR-2.1) and bicycle and pedestrian undercrossings (Mitigation Measure TR-2.2):

- El Camino Real/University Avenue-Palm Drive [intersection #10]
- Middlefield Road/Willow Road [intersection #18]
- Junipero Serra Boulevard – Foothill Expressway/Page Mill Road [intersection #23]
- Junipero Serra Boulevard/Campus Drive West [intersection #26]
- Arboretum Road/Galvez Street [intersection #37]
- Middlefield Road/Ravenswood Avenue [intersection #46]
- Bayfront Expressway/Willow Road [intersection #52]
- University Avenue/Bayfront Expressway [intersection #53]
- Alpine Road/I-280 northbound off-ramp [intersection #62]

Enhanced Transportation Demand Management Program. Stanford University currently implements a TDM program for its employees. The TDM program for SUMC includes providing VTA Eco-Passes to employees. The Eco-Pass allows unlimited travel on VTA buses and light rail vehicles. However, most SUMC employees (77.1 percent) continue to drive alone to work, whereas only 54.4 percent of the rest of the larger University's employees drive alone to work. There is thus a difference in commuting patterns between SUMC employees and employees in the rest of the University. Mitigation Measure TR-2.3 requires the SUMC

Project sponsors to enhance the current TDM program, with the intent to increase the percentage of SUMC employees who commute by Caltrain. This increased use of Caltrain would be achieved by purchasing Caltrain GO Passes or an equivalent TDM measure for SUMC employees, following the example set by Stanford University where 15.8 percent of its employees use Caltrain. Assuming that this goal could be achieved, then the percentage of SUMC employees that commute by alternative modes of transportation (carpool, vanpool, bus, Caltrain, bicycle, walk) would increase from the current 22.9 percent to 35.1 percent. An equivalent TDM measure may also be implemented. The following analysis is based on SUMC achieving a similar Caltrain mode share as Stanford University currently achieves.

Stanford University currently purchases Caltrain GO Passes for its academic campus employees; SUMC employees are not currently eligible to receive the Caltrain GO Pass under the current TDM program. The Caltrain Go Pass is an annual train pass purchased by companies for their employees. Employees eligible for a Caltrain GO Pass are those who do not live on campus and work more than 20 hours a week. This is estimated to be about 10,000 SUMC employees when the SUMC Project would be fully built out. The University currently has a total employment of approximately 11,000 and purchases 9,400 GO Passes annually. GO Passes or an equivalent TDM measure could offer a great level of traffic mitigation for the SUMC Project because this measure could potentially shift both new and existing trips from auto mode to transit.

Stanford monitors the mode split to the University and to the SUMC. The current mode split for the University to Caltrain is 15.8 percent. The current mode split for the SUMC to Caltrain is 3.6 percent. The existing number of employees at the SUMC is approximately 8,300. The future number of employees would be approximately 10,600.[11] Although some of the SUMC employees commute during the evening and on weekends, 89 percent of the SUMC employment base work on weekdays, during typical daytime hours.

The likelihood of using Caltrain is a function of place of residence. Employee location data indicates that 52 percent of the University employees on the Peninsula live within a city that is served by Caltrain. For SUMC employees, this percentage increases to 65 percent.

With the implementation of GO Passes or an equivalent TDM measure for SUMC employees, the use of Caltrain by 2025 is estimated to reach the current level found for the University. A mode split to Caltrain of 15.8 percent would reduce the AM Peak Hour inbound traffic from the project analysis by about 500 trips, with the same level of reduction for outbound PM Peak Hour trips. In addition, there would also be parking savings at the SUMC Sites. The expected overall parking saving in 2025 would be approximately 720 spaces; of which 190 spaces are attributed to the new employees from the SUMC Project. The Transportation Impact Analysis (Appendix C) presents the details. Annual monitoring and reporting would be required to

[11] Based on employment identified in the following memorandum: Fehr & Peers Transportation Consultants, Analysis of GO Pass Program for Hospital Employees, September 22, 2008, pp. 9-10. See Appendix H to the Transportation Impact Analysis.

ensure that the assumed modal split to Caltrain and away from the single occupant vehicles would actually be achieved. Since GO Passes would only be applicable to employees living near the Caltrain corridor, it is assumed that employees from the East Bay area would have the option of parking at the Ardenwood Park and Ride Lot and transferring to public transit (U Line).

If the desired mode split would not be achieved in the design year, the SUMC Project sponsors would be required to further expand and improve the TDM program. Examples of additional measures could be to increase the parking permit charges while increasing the incentives to those who carpool or do not drive.

The initial enhancements to the TDM program should include the following:

- Provide Caltrain GO Passes, or an equivalent TDM measure, to all eligible SUMC employees.
- If Caltrain GO Passes would be provided to SUMC employees, arrangements would also be needed to lease 75 spaces at the Ardenwood Park and Ride Lot, for those employees commuting from the East Bay.
- Expand bus service in support of the issuance of GO Passes.
- Expand the Marguerite shuttle bus service, and integrate it with the other City of Palo Alto shuttle bus service.
- Expand and improve the bicycle and pedestrian networks.
- Provide a full-time on-site TDM coordinator by 2015 for the hospital components. The coordinator would be responsible for organizing and disseminating TDM information primarily to hospital employees and also to hospital patients. A central location would be made available to provide information on alternative travel modes. Also, the hospital website would contain information on TDM programs.
- Provide a guaranteed ride home program for all employees who use transit and other transport alternatives like carpool and vanpool. The guarantee ride home allows employees with dependent children the ability to use alternative modes to travel to and from work but still be able to travel home mid-day in case of an emergency.
- Provide employees with shower facilities within the SUMC to encourage bicycling to work. Bicycle storage facilities would also be required on the SUMC Sites, in areas conveniently located near the employee showers.
- Perform annual TDM monitoring and submit the report to the City of Palo Alto to ensure that the assumed modal split to alternative forms of travel and away from autos would actually be achieved.
- Establish, in conjunction with the GO Pass implementation, a “Zip Car” program with Zip cars available at the SUMC Sites.

Combining the effects of the three mitigation measures:

- Traffic adaptive signal technology (Mitigation Measure TR-2.1)
- Additional bicycle and pedestrian undercrossings (Mitigation Measure TR-2.2)
- Enhanced Transportation Demand Management (Mitigation Measure TR-2.3)

would completely mitigate the SUMC Project's intersection impacts during the AM Peak Hour. SUMC Project impacts at all five previously affected intersections would be alleviated.

In the PM Peak Hour, significant impacts at eight intersections would be alleviated. However, the following four intersections would remain significantly impacted:

- Middlefield Road/Willow Road [intersection #18]
- Arboretum Road/Galvez Street [intersection #37]
- Bayfront Expressway/Willow Road [intersection #52]
- University Avenue/Bayfront Expressway [intersection #53]

If GO Passes or an equivalent TDM measure are provided to SUMC employees, the congestion levels at some intersections would be reduced to a less-than-significant level. The TDM measures proposed as mitigation measures would increase transit ridership on some routes, as indicated in the discussion under Impact TR-7. At such time that ridership load factors during either the AM or PM peak exceed 1.0 on the U Line, headways would need to be decreased to bring the load factor to less than 1.0. Load factor is the ratio of number of passenger versus the number of seats. A load factor of 1.0 means the number of passengers equals the number of seats and no passenger would be standing. Monitoring would need to be conducted periodically to determine the current load factor. At such time that ridership load factors during either the AM or PM peak exceed 1.25 on Marguerite Line A or Line B Counter-Clockwise, headways would need to be decreased to bring the load factor to less than 1.25. Monitoring would need to be conducted periodically to determine the current load factor.

Intersection Improvements. Intersection improvements include a range of measures such as signalizing a stop controlled intersection, re-configuring an intersection by changing the way that specific lanes are used, and adding capacity to an intersection by increasing the number of lanes. Theoretically, implementation of these improvements would, by themselves and without the implementation of any other mitigation measures, completely alleviate all of the SUMC Project's impacts during the AM and PM Peak Hours.

Intersection improvements have been identified at the following 13 intersections:

- El Camino Real/Ravenswood Avenue [intersection #3]
- El Camino Real/University Avenue - Palm Drive [intersection #10]
- El Camino Real/Page Mill Road - Oregon Expressway [intersection #16]

- Middlefield Road/Willow Road [intersection #18]
- Middlefield Road/Lytton Avenue [intersection #19]
- Junipero Serra Boulevard – Foothill Expressway/Page Mill Road [intersection #23]
- Junipero Serra Boulevard/Campus Drive West [intersection #26]
- Santa Cruz Avenue/Sand Hill Road [intersection #30]
- Arboretum Road/Galvez Street [intersection #37]
- Middlefield Road/Ravenswood Avenue [intersection #46]
- Bayfront Expressway/Willow Road [intersection #52]
- University Avenue/Bayfront Expressway [intersection #53]
- Alpine Road/I-280 NB Off-Ramp [intersection #62]

Table 3.4-18 provides a detailed description of the improvements at each intersection. The improvements to intersections in the City of Menlo Park are from the City's General Plan. As shown in Table 3.4-18, only some of the identified improvements are physically feasible, for several reasons. First, the City of Palo Alto has adopted a policy[12] that discourages the addition of roadway capacity. The specific wording of this policy is below:

Policy T-27: Avoid major increases in street capacity unless necessary to remedy severe traffic congestion or critical neighborhood traffic problems. Where capacity is increased, balance the needs of motor vehicles with those of pedestrians and bicyclists.

In addition, the City of Menlo Park is also trying to encourage commuters to use alternative modes of travel to the automobile. Also, while several of the intersection improvements in Table 3.4-18 would not result in additional capacity, some of these improvements are only considered to be potentially feasible. In some cases these intersection improvements are not included in their respective jurisdiction's general plan. The ultimate decision as to whether to implement the improvements in the Cities of Palo Alto and Menlo Park rests with their City Councils. Pending these decisions, the ultimate feasibility of the improvements is uncertain. Lastly, there is also a degree of uncertainty regarding some of the improvements' funding. The SUMC Project sponsors would be responsible for contributing a fair-share amount towards the feasible improvements. However, complete funding needs for some of the improvements have yet to be determined or acquired.

[12] City of Palo Alto. *Palo Alto 1998 - 2010 Comprehensive Plan,* Policy T-27.

Table 3.4-18
Intersection Improvements

#	Intersection	Peak Hour	Jurisdiction	Roadway Mitigation	Feasible?
10	El Camino Real/ University Avenue - Palm Drive	AM/ PM	Caltrans	Provide an exclusive right-turn lane for eastbound and westbound Palm Drive-University Avenue, giving two lanes to the through movement along Palm Drive-University Avenue. While physically possible, this mitigation would require the acquisition of right-of-way, the construction of a retaining wall for the westbound right turn and the relocation of the entrance arch to Stanford for the eastbound right turn. This mitigation measure would be inconsistent with City General Plan Policy T-27.	Not Feasible
16	El Camino Real/Page Mill Road - Oregon Expressway	AM/ PM	Caltrans	Provide an exclusive right-turn lane for westbound Oregon Expressway in addition to the two through lanes and increase the cycle length to 160 seconds. The westbound right turn lane would be feasible, but would require right-of-way from the VTA park-and-ride lot. This mitigation is consistent with previous identified mitigation for the 1998-2010 Palo Alto Comprehensive Plan EIR.	Feasible
62	Alpine Road / I-280 NB Off-Ramp	AM/ PM	Caltrans	Signalize the intersection. Signalization of this intersection would be feasible. Traffic signal warrants are met.	Potentially Feasible
37	Arboretum Road / Galvez Street	AM/ PM	Santa Clara County; within Stanford University	Signalize the intersection. Signalization of this intersection would be feasible. Traffic signal warrants are met.	Feasible
30	Santa Cruz Avenue/Sand Hill Road	AM	Menlo Park	This intersection is fully built-out, additional improvements would be difficult to implement. Northbound Santa Cruz Avenue needs an additional right turn lane. The right-of-way requirements and cost make the improvements infeasible. This intersection is under the jurisdiction of Menlo Park. Any capacity improvements would require their approval.	Not Feasible
3	El Camino Real/ Ravenswood Avenue	PM	Caltrans	Under Menlo Park's General Plan, the proposed improvements are: to re-stripe the exclusive right-turn lane on southbound El Camino Real to shared through/right lane and to provide an additional through lane for northbound El Camino Real by removing the right-turn slip island. The general plan improvement also proposes to provide an exclusive right-turn lane for eastbound Menlo Avenue. This intersection is located in Menlo Park. Approval for implementation would be required from Caltrans and Menlo Park.	Potentially Feasible

Table 3.4-18
Intersection Improvements

#	Intersection	Peak Hour	Jurisdiction	Roadway Mitigation	Feasible?
52	Bayfront Expressway/ Willow Road	PM	Caltrans	Provide one more right-turn lane for eastbound Willow Road and make the right-turn movement for southbound Bayfront Expressway "overlap" with the left-turn of eastbound Willow Road. The intersection has signals for the right-turn movement for southbound Bayfront but the 'overlap' phase is not implemented. The intersection performance would also improve with only the additional eastbound right-turn lane provision. Implementation would be physically possible. This intersection is located in Menlo Park. Changes to the traffic signal would require consent from Caltrans and Menlo Park. The Peninsula Gateway transportation analysis suggested grade-separation of this intersection.	Potentially Feasible
53	University Avenue/ Bayfront Expressway	PM	Caltrans	Grade separate the northbound left-turn from Bayfront Expressway to University Avenue. This intersection is located in Menlo Park. Approval for implementation would be required from Caltrans and Menlo Park. The Peninsula Gateway transportation analysis also suggested grade-separation of this intersection.	Not Feasible
23	Junipero Serra Boulevard – Foothill Expressway/ Page Mill Road	PM	Santa Clara County	Provide three left-turn lanes for northbound Foothill Expressway onto westbound Page Mill Road. Page Mill Road must be widened to receive the three turn lanes. Though physically possible, it would be costly to widen Page Mill Road between Junipero Serra Boulevard and Old Page Mill Road (or Coyote Hill Road) and Foothill Expressway. This intersection is under the jurisdiction of Santa Clara County and implementation of any mitigation measures would require their approval.	Not Feasible
26	Junipero Serra Boulevard/ Campus Drive West	PM	Santa Clara County	Increase signal cycle length to 90 seconds. This mitigation would be potentially feasible. This intersection is under the jurisdiction of Santa Clara County. Changes to the signal timing would require County approval.	Potentially Feasible
18	Middlefield Road/Willow Road	PM	Menlo Park	Make the right-turn movement for northbound Middlefield Road 'overlap' with the left-turn of westbound Willow Road. To effectively utilize the additional capacity of right-turn signal overlap, the existing right-turn should be lengthened. This measure would be physically possible. However, extending the right-turn lane would require removal of the planter box and also removal of several on-street parking	Not Feasible

Table 3.4-18
Intersection Improvements

#	Intersection	Peak Hour	Jurisdiction	Roadway Mitigation	Feasible?
				spaces in front of the grocery store. This intersection is under the jurisdiction of Menlo Park. Changes to the traffic signal and lengthening the right-turn lane would require consent from Menlo Park.	
19	Middlefield Road/Lytton Avenue	PM	Palo Alto	Provide a new exclusive right-turn lane for southbound Middlefield Road. This would provide two southbound through lanes and a right turn lane. This mitigation would be infeasible because of right-of-way required from the residences, removal of mature trees and reducing the width of already narrow front yards. Capacity improvements at this intersection would be contrary to the City's General Plan Policy T-27.	Not Feasible
46	Middlefield Road/ Ravenswood Avenue	PM	Menlo Park	Under Menlo Park's General Plan, the proposed improvement for this intersection would be to provide an additional exclusive left-turn lane for northbound Middlefield Road. This intersection is located in Menlo Park. Traffic capacity improvements would require their approval.	Potentially Feasible

Source: AECOM Transportation, 2010, and City of Palo Alto, 2010.

The three feasible intersection improvements in Table 3.4-18 were combined with the other three higher priority mitigation measures, to determine what the combined impact of all four mitigation measures would be. Implementation of the feasible improvements would be required under Mitigation Measure TR-2.4. Mitigation Measure TR-2.5 requires the City of Palo Alto to work with other jurisdictions towards achieving feasibility for improvements that have been determined to be potentially feasible; subsequently, the SUMC Project sponsors would be required to pay their fair share towards those improvements determined to be feasible. However, since feasibility of those potentially feasible improvements is uncertain, then Mitigation Measure TR-2.5 is not counted towards post-mitigation conclusions for the SUMC Project. If the following four mitigation measures:

- Traffic adaptive signal technology (Mitigation Measure TR-2.1)
- Additional bicycle and pedestrian undercrossings (Mitigation Measure TR-2.2)
- Enhanced Transportation Demand Management (Mitigation Measure TR-2.3)
- Feasible intersection improvements (Mitigation Measure TR-2.4)

were to be implemented together, they would completely mitigate the SUMC Project's intersection impacts during the AM Peak Hour. SUMC Project impacts at all five previously affected intersections would be alleviated.

In the PM Peak Hour, project impacts at nine intersections would be alleviated. However, the following three intersections would remain significantly impact:

- Middlefield Road/Willow Road [intersection #18]
- Bayfront Expressway/Willow Road [intersection #52]
- University Avenue/Bayfront Expressway [intersection #53]

Summary. The results of the above sequential analysis are summarized in Table 3.4-19. Under all combinations of feasible mitigation measures, impacts of the SIMC Project on intersection LOS would remain significant and unavoidable. Of all of the feasible combinations, the one that would have the largest reduction in impact, and that mitigates the greatest number of the intersection impacts, would be the combination of traffic adaptive signal technology (Priority 1), additional bicycle and pedestrian undercrossings (Priority 2), enhanced Travel Demand Management program (Priority 3), and feasible intersection improvements (Priority 4). This combination of mitigation measures would reduce the SUMC Project impacts to a less-than-significant level at all of the impacted intersections during the AM Peak Hour. However, intersection impacts would remain significant and unavoidable in the PM Peak Hour at the following three intersections with mitigation. (SU)

- Middlefield Road/Willow Road [intersection #18]
- Bayfront Expressway/Willow Road [intersection #52]
- University Avenue/Bayfront Expressway [intersection #53]

Table 3.4-19
Summary of Mitigation of Intersection Impacts

Combination of Mitigation Measures	# of Remaining AM Peak Hour Intersections Impacted	# of Remaining PM Peak Hour Intersections Impacted	Significance Level with Mitigation
P1	4	9	SU
P1 + P2	3	9	SU
P1 + P2 + P3	0	4	SU
P1 + P2 + P3 + P4	0	3	SU

Source: AECOM Transportation, 2010.
Note: SU = Significant and Unavoidable

TR-2.1 *Install Traffic Adaptive Signal Technology.* The SUMC Project sponsors shall contribute to the Palo Alto Citywide Traffic Impact Fee program, for the installation of traffic adaptive signals. However, this fee is not structured to mitigate one hundred percent of project related impacts, and an additional fee could be imposed by the City on the SUMC Project sponsors to mitigate the remaining share of the SUMC Project impacts. In Menlo Park, the SUMC Project sponsors shall contribute their fair share amount, which shall be tied to the amount of traffic added to analyzed intersections by the SUMC Project. The SUMC Project sponsors' contributions shall apply towards the installation of traffic adaptive signals as listed below.

- Sand Hill Road (Oak Creek to Shopping Center) - 4 signals
- Arboretum Road (Shopping Center to Palm Drive) - 3 signals
- Embarcadero Road (Bryant to Saint Francis) - 7 signals
- University Avenue (Palm to Lincoln) - 13 signals
- Lytton Avenue (Alma to Middlefield) - 10 signals
- Hamilton Avenue (Alma to Middlefield) - 10 signals
- Middlefield Road (San Antonio to Homer) - 9 signals
- Charleston Road (Alma to Middlefield) - 2 signals
- El Camino Real (northern city limits of Menlo Park to southern city limits of Palo Alto) – signals would require approval of Caltrans

TR-2.2 *Fund Additional Bicycle and Pedestrian Undercrossings*. The SUMC Project sponsors shall contribute their fair share to the cost of construction of the Everett Avenue undercrossing of the Caltrain tracks in Palo Alto and the Middle Avenue undercrossing in Menlo Park. In Palo Alto, there is a Citywide Traffic Impact Fee program that the SUMC Project sponsors shall contribute to. However, this fee is not structured to mitigate one hundred percent of the SUMC Project related impacts, and an additional fee may be imposed by the City to mitigate the remaining share of the SUMC Project impacts. In Menlo Park, the fair share contribution shall be tied to the amount of traffic added to analyzed intersections by the SUMC Project. The construction of the Everett Avenue and Middle Avenue undercrossings would reduce traffic volumes on nearby streets, such as Ravenswood Avenue and University Avenue.

TR-2.3 *Enhance Stanford University Travel Demand Management (TDM) Program.* The SUMC Project sponsors shall enhance the currently-implemented TDM program in order to achieve 35.1 percent usage of alternative transportation modes (i.e., carpool, vanpool, bus, Caltrain, bicycle, and walk) by SUMC employees. The initial enhancements to the SUMC TDM program shall include the following:

- Provide Caltrain GO Passes, or an equivalent TDM measure, to all eligible hospital employees and set target Caltrain mode share for hospital employees equal to 15.8 percent.

- If Caltrain GO Passes would be provided to SUMC employees, make arrangements with AC Transit to lease 75 spaces at the Ardenwood Park & Ride Lot, to serve SUMC employees who commute from the East Bay.
- Expand bus service in support of the issuance of GO Passes.
- Expand the Marguerite shuttle bus service, and integrate it with the other City of Palo Alto shuttle bus service.
- Maintain load factors less than 1.00 on the U Line, and less than 1.25 on the Marguerite shuttle.
- Expand and improve the bicycle and pedestrian networks.
- Provide a full-time on-site TDM coordinator by 2015 for the hospital components. The coordinator would be responsible for organizing and disseminating TDM information primarily to hospital employees and also to hospital patients. A central location would be made available to provide information on alternative travel modes. Also, the SUMC or hospitals' website would contain information on TDM programs.
- Provide a guaranteed ride home program for all employees who use transit and other transport alternatives like carpool and vanpool. The guarantee ride home shall allow employees with dependent children the ability to use alternative modes to travel to and from work but still be able to travel home mid-day in case of an emergency.
- Provide employees with shower facilities within the SUMC Sites to encourage bicycling to work. The SUMC Project sponsors shall also provide bicycle storage facilities on the SUMC Sites that would be conveniently located near the employee showers.
- Establish, in conjunction with the GO Pass implementation, a "Zip Car" (or other similar car-sharing program) with Zip Cars available at the medical complex.
- Perform annual TDM monitoring and submit the report to the City of Palo Alto to ensure that the assumed modal split to alternative forms of travel and away from autos would be actually achieved.

These enhancements may not immediately change the mode split for SUMC employees, because many employees would be unable to change long standing commute patterns overnight. However, with the passage of a mutually agreed amount of time, it is expected that the enhanced TDM program would gradually result in a shift in the mode split of SUMC employees. If this proves not to be the case, then a second round of improvements to the TDM program shall be implemented. Examples of additional measures could be to increase the parking permit charges while increasing the incentives to those who carpool or do not drive. If, by the year 2025, at least 35.1 percent of SUMC employees are not using alternative transportation modes, then a second round of improvements to the TDM shall be implemented. Examples of additional measures could be to increase the parking permit charges while increasing the incentives to those who carpool or do not drive. Thereafter, SUMC Project sponsors shall monitor/survey employee use of alternative modes of transportation on an at least bi-annual basis, and shall continue to improve its TDM program, until it is confirmed to the satisfaction of the City that the target of 35.1 percent usage has been met.

TR-2.4 *Fund or Implement those Intersection Improvements that Have Been Determined to be Feasible*. The SUMC Project sponsors shall implement the following measures:

- For the intersection of El Camino Real/Page Mill Road - Oregon Expressway, the SUMC Project sponsors shall pay a fair share towards (1) provision of exclusive right-turn lane for westbound Oregon Expressway, in addition to the two through lanes, (2) increasing the cycle length to 160 seconds. Improvements to the westbound right turn lane would require right-of-way from the VTA park-and-ride lot.
- At the intersection of Arboretum Road/Galvez Street, the SUMC Project sponsors shall install a traffic signal.

TR-2.5 *Coordinate with Other Jurisdictions for Potentially Feasible Roadway Improvements*. The City of Palo Alto shall work with other jurisdictions to try to achieve feasibility for the following roadway improvements or adjustments. In the event that one or more of the below improvements would then be determined to be feasible, the SUMC Project sponsors shall pay their fair share towards implementation of the improvements, if a fair share contribution would apply.

- Alpine Road/I-280 NB Off-Ramp - Signalize this intersection. The City shall coordinate with Caltrans regarding feasibility of these improvements.
- El Camino Real/Ravenswood Avenue - Re-stripe the exclusive right-turn lane on southbound El Camino Real to a shared through/right lane. Also, provide an additional through lane for northbound El Camino Real by removing the right-turn slip island. Also, provide an exclusive right-turn lane for eastbound Menlo Avenue. The City shall coordinate with the City of Menlo Park and Caltrans regarding feasibility of these improvements.
- Bayfront Expressway/Willow Road - Provide one more right-turn lane for eastbound Willow Road and make the right-turn movement for southbound Bayfront Expressway “overlap” with the left-turn of eastbound Willow Road. The intersection has signals for the right-turn movement for southbound Bayfront Expressway, but the “overlap” phase is not implemented. The City shall coordinate with the City of Menlo Park regarding feasibility of these improvements.

- Middlefield Road/Ravenswood Avenue - Provide an additional exclusive left-turn lane for northbound Middlefield Road. The City shall coordinate with the City of Menlo Park regarding feasibility of this improvement.
- Junipero Serra Boulevard/Campus Drive West – Request that Santa Clara County change the signal cycle length at this intersection to 90 seconds. The City shall coordinate with the County of Santa Clara regarding feasibility of this adjustment.

TR-3. Impacts on Roadway Segments. The SUMC Project would result in adverse traffic impacts to roadway segments in the City of Menlo Park. (S)

The TIRE Index analysis methodology was used to evaluate the traffic impacts of the SUMC Project on residential roadways in 2025. As can be seen in Table 3.4-20, the SUMC Project would not have a significant impact on any residential roadway segments in 2025.

For roadway segments in Menlo Park, an ADT analysis was conducted that involved estimating the net increase in traffic volumes that would result from implementation of the SUMC Project. For Marsh Road, Sand Hill Road, Willow Road, Alpine Road and Ravenswood Avenue that are classified as minor arterials with No Build volumes greater than 18,000, adding more than 100 trips in ADT would be considered a significant impact (see Table 3.4-21).

The SUMC Project would add more than 300 trips on these roadway segments. As such, the SUMC Project would impact these roadway segments in Menlo Park according to the City of Menlo Park's significance criteria. All other roadway segments in Menlo Park would not be significantly impacted by the SUMC Project.

MITIGATION MEASURES. With the provision of additional bicycle and pedestrian undercrossings (Mitigation Measure TR-2.2), the enhanced TDM program (Mitigation Measure TR-2.3), and contribution to the City of Menlo Park shuttle fee (Mitigation Measure TR-7.2), there would still be significant impacts on four Menlo Park roadways, including Marsh Road, Willow Road, Sand Hill Road, and Alpine Road, as shown in Table 3.4-22. Therefore, the traffic impacts to Marsh Road, Sand Hill Road, Willow Road, and Alpine Road would remain significant and unavoidable with mitigation. (SU)

Table 3.4-20
Impacts on Residential Roadways, Based on TIRE Index

		2025 No Project		2025 with SUMC Project		
Residential Road	**Segment**	**ADT**	**TIRE Index**	**ADT**	**Change**	**Significant Impact**
Santa Cruz Avenue	N of Sand Hill Road	25,747	4.4	25,900	153	N
Sharon Road	N of Sharon Park Drive	4,774	3.7	4,808	33	N
Stanford Avenue	N of Sand Hill Road	186	2.3	186	0	N
Leland Avenue	N of Sand Hill Road	337	2.5	337	0	N
Vine Street	N of Sand Hill Road	429	2.6	429	0	N
Hawthorne Avenue	East of Alma Street	2,193	3.3	2,320	127	N
Everett Avenue	East of Alma Street	1,759	3.2	1,886	127	N
Hamilton Avenue	Between Chaucer Street and Lincoln Avenue	3,121	3.5	3,774	653	N

Source: AECOM Transportation, 2010.

Table 3.4-21
2025 with SUMC Project Menlo Park Roadway ADT Analysis

Roadway	Type	Segment	No Build	With SUMC	Impact
Marsh Road	Minor Arterial	West of US 101	39,454	39,901	**Y**
Sand Hill Road	Minor Arterial	East of Santa Cruz Avenue	33,407	35,374	**Y**
Willow Road	Minor Arterial	East of Middlefield Road	23,823	24,904	**Y**
	Collector	West of Middlefield Road	6315	6315	N
Alpine Road	Minor Arterial	West of Junipero Serra Boulevard	25,120	25,634	**Y**
Middlefield Road	Minor Arterial	North of Ravenswood Avenue	14,359	14,652	N
	Minor Arterial	South of Ravenswood Avenue	25215	25268	N
Ravenswood Avenue	Minor Arterial	East of El Camino Real	22,705	23,038	**Y**
Santa Cruz Avenue	Minor Arterial	West of El Camino Real	6,530	6,530	N
Valparaiso Avenue	Minor Arterial	West of El Camino Real	16,239	16,306	N

Source: AECOM Transportation, 2010.

Table 3.4-22
2025 Roadway ADT Analysis, with Enhanced TDM and Additional Undercrossings (Menlo Park)

Roadway	Type	Segment	No Build	With SUMC	Impact
Marsh Road	Minor Arterial	West of US 101	39454	39581	**Y**
Sand Hill Road	Minor Arterial	East of Santa Cruz Avenue	33407	33947	**Y**
Willow Road	Minor Arterial	East of Middlefield Road	23823	24130	**Y**
	Collector	West of Middlefield Road	6315	6315	N
Alpine Road	Minor Arterial	West of Junipero Serra Boulevard	25120	25260	**Y**
Middlefield Road	Minor Arterial	North of Ravenswood Avenue	14359	14439	N
	Minor Arterial	South of Ravenswood Avenue	25215	24728	N
Ravenswood Avenue	Minor Arterial	East of El Camino Real	22705	22316	N
Santa Cruz Avenue	Minor Arterial	West of El Camino Real	6530	6530	N
Valparaiso Avenue	Minor Arterial	West of El Camino Real	16239	16253	N

Source: AECOM Transportation, 2010.
Assumptions:
No build - both peaks = 20% of daily traffic
Project only - both peaks = 15% of daily traffic. This rate was determined based on peak hour trip and daily trip ratio of SUMC land uses.

TR-4. Local Circulation Impacts. The SUMC Project could result in significant traffic impact to the local circulation network in the immediate vicinity of the SUMC Sites. (S)

The local circulation network would be enhanced by the SUMC Project. Capacity improvements would be made to Welch Road and to Pasteur Drive, as previously described. Durand Way would also be extended, between Sand Hill Road and Welch Road.

However, the traffic projections for Welch Road indicate that it would be approaching capacity. Future traffic volumes are projected at 14,750 vehicles per day, which is approaching the capacity of a two-lane roadway with a continuous two way left turn lane in the median. The traffic volumes projected for Welch Road, combined with the numerous turning vehicles, pedestrian movements across and along Welch Road, and bicycle travel along Welch Road, would potentially create a safety hazard, which would be a significant impact.

Due to the shortness of the link, there is also the possibility that the queue to make the westbound left turn from Durand Way to Sand Hill Road would back up all the way to the intersection of Welch Road and Durand Way. This would also be a significant impact.

MITIGATION MEASURES. Mitigation Measure TR-4.1, involving funding and implementation of a traffic impact study, and Mitigation Measure TR-4.2, involving re-striping of Durand Way, would reduce the SUMC Project's impact to a less-than-significant level. (LTS)

TR-4.1 *Fund Traffic Impact Study.* Upon construction of the SHC and LPCH hospital components, the SUMC Project sponsors shall fund an independent traffic evaluation, commissioned by the City, based on actual travel patterns, volumes and emergency access, with an emphasis on ease of circulation around and through the medical complex to determine if the private street connection between Roth Way and Pasteur Drive should be operated as a public street. If the independent traffic study demonstrates that the connection between Roth Way and Pasteur Drive as a public street would improve circulation, then the connection shall be designated as a public street for all vehicular, bicycle, pedestrian, and transit traffic.

TR-4.2 *Fund Signing and Striping Plan and Signal Optimization.* In addition to paying for the construction of the extension of Durand Way from Sand Hill Road to Welch Road, the SUMC Project sponsors shall also pay for the following improvements to ensure that queues from the Durand Way/Sand Hill Road intersection do not spillback onto the Durand Way/Welch Road intersection.

- A signing and striping plan for the Durand Way extension, which would maximize the storage capacity by creating a four-lane roadway with a left and through/right at Sand Hill Road and a right and through/left at Welch Road;
- The installation and optimization of the two signals at the intersections of Durand Way/Sand Hill Road and Durand Way/Welch Road.

TR-5. *Freeway Impacts. The SUMC Project would result in less-than-significant impacts on freeways. (LTS)*

The VTA, the designated CMA for Santa Clara County, has established a threshold of one percent of freeway capacity as a trigger for requiring freeway level of service analysis. As shown in Table 3.4-23, the impacts of the SUMC Project would not contribute sufficient traffic to US 101 or I-280 to require this analysis to be conducted. The individual impact of the SUMC Project would not exceed the level of service standards established by the County CMA for designated highways. As such, the SUMC Project would have a less-than-significant impact on freeways.

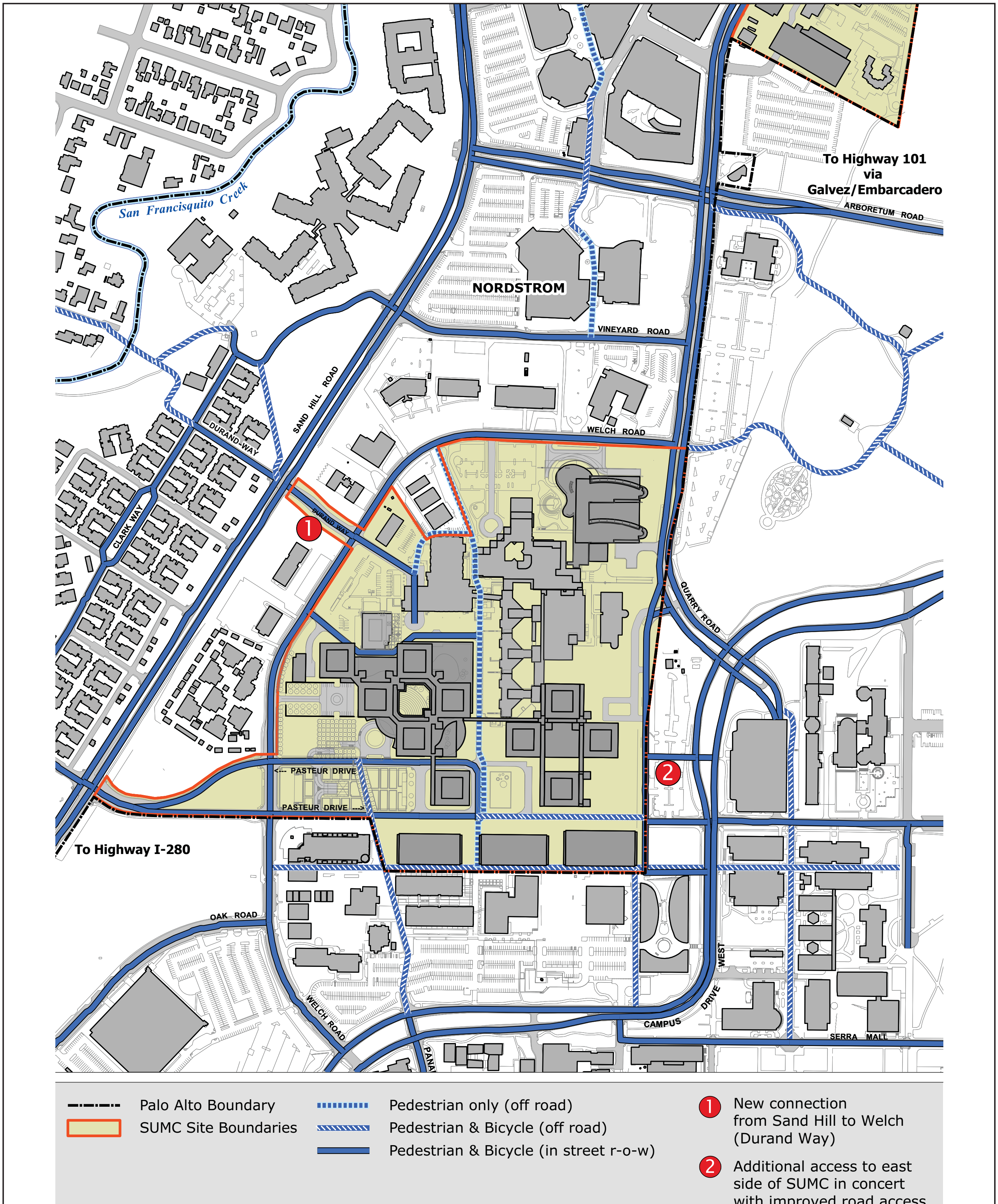
TR-6. *Bicycle and Pedestrian Impacts. The SUMC Project could impede the development or function of planned bicycle or pedestrian facilities, and result in a significant impact. (S)*

The Study Area is conducive to bicycle and pedestrian travel, and an extensive bicycle and pedestrian network currently exists around SUMC sites. Figure 3.4-10 shows the Primary Bicycle and Pedestrian Circulation as currently proposed. Bicycle and pedestrian facilities are extant on nearly all streets in the areas surrounding the SUMC Sites. There are also numerous off-road pedestrian-only as well as combined bicycle and pedestrian facilities.

Table 3.4-23
2025 with SUMC Project Freeway Analysis

Freeway	Freeway Segment	Direction	No of Mixed Lanes	Peak Period	Total Capacity	2025 with SUMC Project: Total Project Trips	Project Trips w HOV Adj	Percent Capacity Added with HOV Adj	Analysis Required
US 101	University Ave to Willow Road	NB	3	AM PM	6900 6900	3 10	2 8	0.03% 0.11%	No No
US 101	University Ave to Willow Road	SB	3	AM PM	6900 6900	10 4	8 3	0.11% 0.04%	No No
US 101	University Ave to Embarcadero/Oregon Expressway	NB	3	AM PM	6900 6900	27 10	20 7	0.30% 0.11%	No No
US 101	University Ave to Embarcadero/Oregon Expressway	SB	3	AM PM	6900 6900	9 26	7 20	0.10% 0.28%	No No
US 101	Embarcadero/Oregon Expressway to San Antonio Road	NB	3	AM PM	6900 6900	82 29	61 22	0.89% 0.32%	No No
US 101	Embarcadero/Oregon Expressway to San Antonio Road	SB	3	AM PM	6900 6900	26 77	20 58	0.28% 0.84%	No No
I-280	Sand Hill Road to Woodside Road	NB	4	AM PM	9200 9200	18 53	NA	0.20% 0.58%	No No
I-280	Sand Hill Road to Woodside Road	SB	4	AM PM	9200 9200	57 20	NA	0.62% 0.22%	No No
I-280	Alpine Road to Page Mill Road	NB	4	AM PM	9200 9200	27 10	NA	0.29% 0.11%	No No
I-280	Alpine Road to Page Mill Road	SB	4	AM PM	9200 9200	6 25	NA	0.07% 0.27%	No No
I-280	Page Mill Road to El Monte Ave	NB	4	AM PM	9200 9200	48 17	NA	0.52% 0.18%	No No
I-280	Page Mill Road to El Monte Ave	SB	4	AM PM	9200 9200	15 45	NA	0.16% 0.49%	No No

Source: AECOM Transportation, 2010.



Source: Stanford Univeristy Land Use & Environmental Planning, 2008

PBS&J

FIGURE 3.4-10

SUMC Project Future Bicycle and Pedestrian Facilities

D41357.00

Stanford University Medical Center Facilities Renewal and Replacement Project

The SUMC Project would increase on-site employment and visitorship. Given the bicycle and pedestrian network surrounding the SUMC Sites, and the proximity of the SUMC Sites to residential areas, the Stanford Shopping Center, PAITS, and other transit facilities, the SUMC Project would result in increased bicycle and pedestrian activity in and around the SUMC Sites. Also, as explained under Impact TR-2, the SUMC Project would generate 10,061 daily trips. An increase in bicycle and pedestrian travel, and traffic volumes, plus the associated intersection congestion caused by higher traffic levels, could result in increased traffic-related hazards to pedestrians and cyclists. An increase in traffic-related hazards would be a significant impact according to the City's significance criteria.

MITIGATION MEASURES. A combination of Mitigation Measure TR-2.3 involving trip-reducing measures, plus Mitigation Measure TR-6.1, which involves several bicycle and pedestrian improvements, would reduce the SUMC Project's impact to a less-than-significant level. The improved facilities would mitigate the hazards to pedestrians and bicyclists brought about by the increased vehicular traffic and congestion. (LTS)

TR-6.1 *Bicycle and Pedestrian Infrastructure Improvements***.** The SUMC Project sponsors shall fund the expansion and improvement of the bicycle and pedestrian network in the immediate vicinity of the SUMC Project. The intent of these improvements is to:

- reduce auto related traffic by providing the infrastructure for alternative travel modes;
- improve the bicycle and pedestrian linkages between the SUMC Project and Downtown Palo Alto, and between the SUMC Project and the surrounding residential neighborhoods; and
- mitigate the safety hazards to pedestrians and cyclists that would result from the SUMC Project related increase in vehicular traffic and congestion.

The specific improvements to be funded by the SUMC Project sponsors shall include the following:

- Provide an enhanced pedestrian crossing at Quarry Road/El Camino Real to establish a strong connection between the SUMC Project and Downtown Palo Alto. The pedestrian crossing shall be 12 feet wide, have contrasting pavement, countdown signal heads, and high visibility markings. Even though the intersection of Quarry Road and El Camino Real is projected to operate at acceptable levels of service, added vehicular traffic through the intersection and added bicycle and pedestrian volumes across the intersection would potentially create safety hazards which would be mitigated by the proposed enhanced crossings.
- Create a bicycle and pedestrian connection between the Stanford Shopping Center and SUMC. The connection shall provide an alternative route to Quarry Road, which is auto dominated. This connection shall extend

between Vineyard Lane and Welch Road. Pedestrian traffic signals and crosswalks shall be placed at the crossing of Vineyard Lane and Welch Road. The crosswalk shall be enhanced either by striping or by the use of contrasting paving.

- Provide a connection from the planned Everett Avenue bicycle and pedestrian undercrossing to the El Camino Real/Quarry Road intersection. Once the tunnel is completed, this linkage shall provide a direct connection between the SUMC Project and Downtown North.
- Provide a bicycle and pedestrian trail through the Arboretum Drive as part of future campus planning in the SUMC area. This trail shall improve access to the SUMC Project. To support this off-street path, bicycle and pedestrian crossings at Arboretum Road and Palo Road shall be enhanced to provide safe crossing of these streets. The crosswalks shall be properly signed, marked, and lighted with enhanced pavement markings and imbedded crosswalk lights. Signalization of this crossing may ultimately be required.
- Incorporate into the Quarry Road corridor, from El Camino Real to Welch Road, continuous sidewalks according to the SUMC Project's Design Guidelines. The extension of Quarry Road west of Welch Road shall continue the pedestrian facilities into the SUMC Project.
- Enhance all signalized intersections in the Project vicinity, particularly along Quarry Road, Vineyard, and Welch Roads to include 12-foot pedestrian crosswalks on all legs, with textured or colored paving or diagonal or longitudinal zebra striping as determined by the City, pedestrian push buttons and countdown pedestrian signal heads, and other specific improvements that are determined as necessary during the design process, such as median refuge islands, advanced signing, flashing beacons, in-pavement lighting, etc.
- Install the appropriate number of Class I and Class III bicycle parking spaces as required by the City's Zoning Ordinance for the total amount of existing and future development. The SUMC Project sponsors shall install the required number of bicycle parking spaces equally distributed throughout the SUMC Sites.

TR-7. Transit Impacts. Implementation of the SUMC Project could impede the operation of the transit system as a result of increased ridership, and result in a significant impact. (S)

The SUMC Project vicinity is currently served by the Marguerite shuttles that connect to the Palo Alto and California Avenue Caltrain stations. Other transit service to the Caltrain Stations and the Stanford Shopping Center that provide connecting service to the Marguerites include SamTrans Routes RX, 280, 281, 297, 390, 397 and KX; VTA Routes 22, 35, 89 and 522; the U Line from the East Bay; and the Palo Alto shuttles.

The SUMC Project would increase on-site employment by 2,242 full-time equivalent employees and would also increase visitorship. The resulting increase in ridership could exceed capacity in the various transit services to and from the SUMC Sites. As such, the SUMC Project could result in a significant impact on transit.

Impacts of Mitigation Measure TR-2.3, Involving Provision of the Caltrain GO Pass to SUMC Employees. The use of transit as a primary means of access to SUMC is expected to increase, particularly with the potential implementation of the GO Pass or equivalent TDM Measure for SUMC employees. The analysis below addresses transit implication of providing the GO Pass or equivalent TDM Measure to SUMC employees.

The current transit mode split for hospital employees is 8.9 percent. This includes ridership on Marguerite shuttles, SamTrans, AC Transit and VTA buses, and Caltrain. Currently, approximately 3.6 percent of SUMC employees use Caltrain to commute to work. On a typical work day this equates to approximately 305 daily inbound and outbound trips. Most of these trips occur during the AM and PM Peak Hours and use the Marguerite shuttle to travel between the SUMC and PAITS.

Providing GO Passes (or equivalent TDM Measure) for SUMC employees is expected to result in the following impacts:

- The mode split for transit is expected to increase to 21.1 percent. Up to 165 AM and 170 PM Peak Hour transit trips would be created by the SUMC Project, depending on the success of the GO Pass.

- Increase the percentage of SUMC employees that commute by Caltrain to approximately 15.8 percent or more. In terms of the number of actual transit trips, this would translate to approximately 1,340 inbound and outbound Caltrain trips per day, which would be an increase of 1,035 riders.

- Increase ridership on the Marguerite shuttles, most notably Line A and Line B Counter-Clockwise. Increased ridership on these two routes could cause a load factor of greater than 1.25. This level of projected transit ridership is considered to be beyond the ability of the current Marguerite shuttle stops to adequately accommodate. This would be considered a significant impact.

- Assuming parking spaces in the expanded Ardenwood park-and-ride lot are made available to SUMC employees, then ridership on the U Line from the East Bay is also expected to increase. The current load factor on the U Line from the East Bay is approaching 1.0 (0.94 according to AC Transit).[13] The expanded ridership could push the load factor above 1.0. A load factor on the U Line greater than 1.0 would be considered a significant impact.

[13] AC Transit, communication with AECOM Transportation, 2009.

- The increase in transit ridership could be a significant impact without facility improvements that accommodate several bus routes simultaneously and also provide queuing areas for the passengers. Traffic volume increases caused by SUMC Project-generated traffic would be a significant impact.

MITIGATION MEASURES. The mitigation of the SUMC Project's transit impacts involves two measures. First, the SUMC Project's site plan needs to be modified to include the addition of mini transit centers. Second, additional transit service needs to be provided to meet the projected increase in demand.

Transit Centers. The projected increase in transit ridership would require the addition of mini-transit centers to the project design. These transit centers would be located at Hoover Pavilion and at SHC and would be off-street facilities. The transit centers would accommodate three to four buses simultaneously, have shelters, seating, lighting, signs, maps, bus schedules, and bicycle parking. On-street bus stops along Welch Road and Quarry Road would also be provided, but the transit centers would accommodate the majority of transit riders and would be located to maximize the convenience of employees, patients and visitors. One transit center in the vicinity of Welch Road and Pasteur Drive to serve SHC and another near the entrance to Hoover Pavilion would provide the focal point for transit use for SUMC. Stanford shall revise their SUMC site plan to incorporate two transit hubs as noted above to reduce the impact to transit service caused by the proposed expansion.

Expand Transit Service. The Marguerite, Crosstown, and Menlo Park Shuttle services and the VTA Community Bus service would need to be expanded to meet the projected increase in demand. In some cases, additional capacity would need to be provided, in the form of new routes, or additional buses and higher frequencies on existing routes.

- **Marguerite Shuttle.** The SUMC Project sponsors shall expand the Stanford University Marguerite shuttle service into Palo Alto. Specifically, Marguerite shuttles shall connect the SUMC to downtown Palo Alto and the areas surrounding the downtown. Currently, Marguerite shuttle routes A and B do not extend into downtown Palo Alto. While the Marguerite shuttle DT and M routes do extend into downtown areas, they do not operate during the majority of the day. This expanded shuttle service could follow new routes or an extension of existing routes. Current headways on existing routes shall be maintained with the expansion.

- **U Line.** Arrangements with AC Transit shall be made to increase U Line service (such as decreasing headways) to meet the increase in demand attributable to the SUMC Project, and ensure that load factors remain below 1.0. Ridership on the U Line would need to be monitored to ensure that load factors remain below 1.0.

- **Crosstown Shuttle.** The City of Palo Alto currently operates the Crosstown Shuttle. More efficient transit service may be provided by providing this service as a part of the Marguerite Shuttle. SUMC should participate in operating the Palo Alto Crosstown Shuttle service.

- **VTA Community Bus Service.** In 2007, the VTA adopted a new Bus Service Operating Plan which made major modifications to the current bus transit network. The plan introduced Community Bus Service throughout Santa Clara County, which features smaller vehicles with an identity tied to the individual communities served. As a part of that plan, local communities are required to cover 25 percent of the cost if they want to have the service free of charge to the riders.

- **Menlo Park Shuttle Bus.** SUMC should contribute to additional shuttle bus service to Menlo Park, as a means of mitigating the increase in daily traffic on minor arterials and collector streets in the City.

Mitigation Measure TR-7.1 involves the addition of transit centers to the SUMC Project's site plans, and Mitigation Measure TR-7.2 involves financial contributions towards the expansion of transit service. Implementation of these measures would reduce the SUMC Project's transit impacts to a less-than-significant level. (LTS)

TR-7.1 *Incorporate Transit Centers Into Site Plans***.** The SUMC Project sponsors shall revise their SUMC Project site plan to incorporate two transit centers to reduce the impact to transit service caused by the SUMC Project. These transit centers shall be located at Hoover Pavilion and at SHC, and shall be off-street facilities. The transit centers shall accommodate three to four buses simultaneously, and shall have shelters, seating, lighting, signs, maps, bus schedules, and bicycle parking. On-street bus stops along Welch Road and Quarry Road shall also be provided, but the transit centers shall accommodate the majority of transit riders and shall be located to maximize the convenience of employees, patients, and visitors. One transit center shall be located in the vicinity of Welch Road and Pasteur Drive to serve SHC. The other transit center shall be located near the entrance to Hoover Pavilion. Both of these transit centers shall provide the focal point for transit use for the SUMC.

TR-7.2 *Provide Expanded Transit Service.* The SUMC Project sponsors shall make a fair share financial contribution to the cost of expanding existing bus service of the Marguerite, Crosstown, and Menlo Park Shuttle bus services, and to the VTA Community Bus Service.

- **Marguerite Shuttle.** The SUMC Project sponsors shall make a financial contribution to expand the Marguerite shuttle service into Palo Alto.

- **U Line.** The SUMC Project sponsors shall make a financial contribution towards the operation of the U Line. Arrangements with AC Transit shall be made to increase U Line service (such as decreasing headways) to meet the increase in demand attributable to the SUMC Project, and ensure that load factors remain below 1.0.

- **Crosstown Shuttle.** The SUMC Project sponsors shall participate in operating the Palo Alto Crosstown Shuttle service, by contributing to the Citywide Traffic Impact Fee, which would include covering the costs of this service. Then current fee is $2,861 per net new PM Peak Hour trips. A portion of Stanford's Citywide Traffic Impact Fee shall be used by the City to expand City shuttle services.
- **VTA Community Bus Service.** The SUMC Project sponsors shall contribute to fund the project's fair share of Palo Alto's share of expanded VTA Community Bus Service.
- **Menlo Park Shuttle Bus.** The SUMC Project sponsors shall pay into the City of Menlo Park shuttle fee at $0.105 per square foot of new development annually or a percentage agreed between Menlo Park and SUMC Project sponsors. In Menlo Park, the contribution shall be tied to the amount of project traffic added to analyzed roadway segments and intersections.

TR-8. Parking Impacts. The SUMC Project would provide adequate parking for its demand, and would thus have a less-than-significant parking impact. (LTS)

The expansions under SUMC Project would include the SHC Hospital, the LPCH, and medical office/clinic buildings. Details of the parking evaluation are presented in the Transportation Impact Analysis in Appendix C.

Table 3.4-24 presents the expected SUMC Project parking demand based on the square footage for 2025. Using the parking demand rate determined through the survey conducted on existing parking conditions, 1,522 spaces would be needed for the hospitals in 2025. Taking into account a 10-percent supply buffer to ensure that drivers are able to locate parking spaces without excessive re-circulating through the parking area, the parking demand at the hospitals is calculated to be 1,674 spaces. Taking away spaces available from current vacancies, new parking spaces needed for the hospitals would be 1,416 in 2025. Parking demand has also been calculated using the City's zoning ordinance and using Parking Generation, a national publication of ITE. The City's Zoning ordinance estimates parking demand similar to that based on surveying existing uses; approximately three percent lower. ITE estimates parking considerably higher because of the high rates for hospital parking per bed.

Table 3.4-24
Estimated Parking Demand and Recommended Supply for SUMC Project in 2025

		Fehr and Peers		City Zoning Ordinance[b]			ITE Parking Generation[c]	
Land Use	**Size**	**Parking Demand Rate[a]**	**Parking Demand**	**Size**	**Parking Demand Rate**	**Parking Demand**	**Parking Demand Rate**	**Parking Demand**
Hospitals								
Hospitals (LPCH + SHC)		-	-	248 beds	0.67 spaces per bed	166 spaces	4.72 spaces per bed	1,171 spaces
Clinics (LPCH + SHC)		-	-	365.7 ksf[d]	4.0 spaces per 1.0 ksf	1,463 spaces	3.53 spaces per ksf	1,291 spaces
Total	854.970 ksf	1.78 spaces per ksf	1,522 spaces		-	1,629 spaces[e]		2,462 spaces[e]
Recommended New Parking Supply (Demand + 10%)[f]			1,674 spaces					
Spaces available from current vacancies[g]			(258 spaces)			(258 spaces)		(258 spaces)
Recommended New Parking Supply[f]			**1,416 spaces**			**1,371 spaces**		**2,204 spaces**
Medical Office Buildings								
Hoover Pavilion Site- New + re-use	144.230 ksf	4.00 spaces per ksf	577 spaces	144.230 ksf	4.0 spaces per ksf	577 spaces[e]	3.53 spaces per ksf	509 spaces[e]
Recommended New Parking Supply (Demand + 10%)			**635 spaces**					
Total Recommended New Parking Supply			**2,051 spaces**			**1,948 spaces**		**2,713 spaces**

Source: AECOM Transportation, 2010.

Notes: ksf = 1,000 square feet

a. Parking demand based on estimated AM Peak Hour rate from data collection. The AM Peak Hour parking rate is slightly higher than the PM Peak Hour parking rate.
b. Parking supply is based on City Zoning Ordinance October 2007.
c. Parking demand rates from ITE *Parking Generation* 3rd edition (Land Use 610 and 720).
d. Total clinic area (square feet) = 315,700 (SHC) + 50,000 (LPCH).
e. 10% vacancy factor not applied to City supply requirements or ITE demand.
f. Parking supply increases the parking demand by 10 percent to ensure drivers are able to locate the parking space without re-circulating through the parking area.
g. Fehr & Peers analysis summarizes the parking areas with existing vacancies. These areas are included: L-7, L-13, S-4.

For the medical office/clinic space, 577 spaces would be needed to meet the parking demand in 2025. Similarly, taking into account a 10-percent supply buffer to ensure that drivers are able to locate parking spaces without excessive re-circulating through the parking area, the parking demand for the medical office/clinic space would be 635 spaces. The City's Zoning ordinance estimates the medical office/clinic parking at 577 spaces, but does not include a 10 percent buffer. Parking Generation estimates the medical office/clinic parking demand at 509 spaces.

As shown in Table 3.4-25, the total new demand for the SUMC Project would be 2,051 parking spaces in 2025. There would also be a need to replace the 932 spaces that would be demolished during project construction. The total demand would therefore be the 2,051 new spaces plus the 932 replacement spaces, which is equal to 2,983 spaces. A total of 2,985 spaces would be supplied, two more than the demand. The 2,985 spaces would be distributed among the four parking structures (SHC, LPCH, Hoover Pavilion, and clinics/medical offices) as shown at the bottom of Table 3.4-25.

However, these parking supply numbers do not take into account traffic mitigation measures that may be implemented. A reduction in parking due to implementing the Caltrain GO Pass or the provision of remote parking lots may be factored into the final on-site parking supply.

Based on the above analysis, the SUMC Project would have a sufficient amount of parking spaces, based on the City Zoning Ordinance. Existing parking spaces that are demolished would be replaced and additional parking spaces are provided for the expansion. No adjustment to SUMC parking is proposed except for reductions available if other mitigation measures that would reduce on-site parking, such as the GO Pass or remote parking lots, are implemented. The proposed TDM measures, including the GO Pass or an equivalent TDM Measure, would eliminate the need for a total of about 720 parking spaces at SUMC. The remote parking plan would eliminate the need for about 640 parking spaces at SUMC. Therefore, the SUMC Project is anticipated to have a less-than-significant impact on parking.

TR-9. Emergency Access. Implementation of the SUMC Project could potentially result in inadequate emergency access due to increased congestion, a significant impact. (S)

Emergency vehicles require access within the Study Area to respond to emergencies and also to access the SUMC emergency room. Travel time by emergency vehicles would increase because of additional traffic congestion associated with the SUMC Project. The City's significance criteria identify inadequate emergency access as a significant impact. The increased congestion identified in this analysis due to the SUMC Project at Study Area intersections is considered a significant impact. Any intersection significantly impacted in terms of level of service or increase in vehicle delay as shown in Table 3.4-17 is also impacted for emergency vehicle access.

Table 3.4-25
SUMC Parking Inventory Changes with SUMC Project

	Size	Parking Demand (veh/ksf)	Spaces
NEW DEMAND			
SHC	543.900	1.78	968
LPCH	395.300	1.78	704
SoM	0.000	1.78	0
New Hoover MOBs	60.000	4.00	240
Hoover Pavilion converted to MOB use	84.230	1.78 - 4.00	187
Subtotal			2,099
Vacancy Factor (10%)			210
Subtotal			2,309
Minus Credit for Current Vacancies[a]			(258)
		Total	**2,051**
DEMOLISHED OCCUPIED SPACES TO BE REPLACED[b]			
Falk (L-5)			115
Hoover			85
Parking Structure 3			671
Subtotal			613
Vacancy Factor (10%)			61
		Total	**932**
		Total Required New And Replacement Parking	**2,983**
PROPOSED PARKING[c]			
SHC Structure			970
LPCH Structure			430
Hoover Structure			1,085
Clinics Structure			500
		Total	**2,985[d]**

Source: SUMC, 2010.

Notes:

a. Use of existing vacancies in Palo Alto SUMC lots to help meet new demand.

b. Spaces at 1101, 701, and 703 Welch would be demolished but they are not currently included in the SUMC parking inventory, so they are not included in these calculations. Demolished spaces refer to those spaces currently in the mid-morning period that are being removed that would be replaced in number.

c. During the design phase, the parking structure numbers would be fine tuned to meet the total required new parking.

d. Includes 2,053 spaces for the SUMC expansion and 932 replacement spaces for existing spaces to be demolished.

MITIGATION MEASURES. Mitigation Measure TR-9.1 involves the installation of emergency vehicle traffic signal priority (OptiCom) at all intersections significantly impacted by the SUMC Project. Implementation of this measure would reduce the SUMC Project's impact to less-than-significant levels. (LTS)

TR-9.1 *Pay Fair Share Towards OptiCom Installation.* The SUMC Project sponsors shall pay their fair-share financial contribution towards the City of Palo Alto, to assist with the installation and operation of emergency vehicle traffic signal priority (OptiCom) at all significantly impacted intersections.

Cumulative Analysis

LOS impacts under the project-level analysis above already account for cumulative growth through 2025 because this growth has been incorporated in the City of Palo Alto Travel Demand Forecasting Model. This growth is also accounted for in the project-level analysis of pedestrian, and emergency access impact. Those analyses that incorporate cumulative growth in the City of Palo Alto Travel Demand Forecasting Model are already capture a cumulative analysis, and no further cumulative discussions for those topics are provided here. Parking impacts are site-specific and do not cumulate with other projects. As such, the only transportation-related impacts to which a cumulative analysis applies are construction-period transportation impacts and transit impacts. The geographic context for the analysis of cumulative construction-period transportation impacts is the Study Area. The geographic context for the analysis of cumulative transit impacts are the service areas of the major transit services serving the SUMC Sites; these areas generally include San Mateo County and Santa Clara County.

TR-10. Cumulative Construction Impacts. The SUMC Project, in combination with concurrent construction projects in the vicinity of the SUMC Sites, could result in a significant construction-period impact. The contribution of the SUMC Project would be cumulatively considerable. (S)

Other projects around SUMC Sites may also be under construction during the time that the SUMC Project is being built. The list of current projects that have been approved for development provides a benchmark of the degree of construction that could occur simultaneously with SUMC Project is provided below. While most of these projects would be completed prior to the construction of the SUMC Project, a similar list of projects could be constructed during the time of the SUMC Project's construction.

- 657 Alma Street
- 473 Acacia Street
- 260 Homer Street
- 325 Lytton Road
- 49 Wells Road
- 441 Page Mill Road
- 855 El Camino Real
- 195 Page Mill Road

- 850 Webster Street
- 317 – 323 University Avenue
- 278 University Avenue
- 310 University Avenue
- 777 Welch Road
- 2747 – 2785 Park Avenue
- 801 – 875 Alma Street
- 2180 El Camino Real
- High Speed Train - construction of additional tracks along the Caltrain right–of-way

In addition to development in the City, construction on the Stanford University campus would also have a cumulative effect on traffic with construction traffic from the SUMC Project. The following is a list of potential projects that could be under construction on the Stanford University campus, within the jurisdiction of Santa Clara County.

- Li Ka Shing Center for Learning and Knowledge (now-2010)
- Lorry I. Lokey Stem Cell Research Building (now-2010)

Projects on the Science and Engineering Quad that would be under construction are:

- Center for Nanoscale Science and Technology (now-2010)
- Huang Engineering Center (now-2010)
- Bio-engineering/Chemical Engineering (2011-2013)

The listed projects would have construction workers using similar travel routes as SUMC construction workers are those in the downtown area and those along El Camino Real south to Page Mill Road. Small residential and retail projects would not create a large number of construction trips and are not included in the list. Nonetheless, construction traffic associated with the SUMC Project and the list of other foreseeable construction projects could result in a significant cumulative impact because these construction projects would involve movement of heavy construction equipment such as cranes, bulldozers, and dump trucks to and from the construction sites, within generally the same designated truck routes.

The SUMC Project would have a cumulatively considerable contribution to the significant construction-period impact because the SUMC Project would comprise the largest construction efforts in the vicinity.

MITIGATION MEASURES. With implementation of Mitigation Measures TR-1.1 through TR-1.9, which involve transportation-related construction management measures, the SUMC Project's contribution to the significant cumulative construction-period impact would be reduced to less than cumulatively considerable. (LTS)

TR-11. Cumulative Transit Impacts. Cumulative growth would result in a less-than-significant cumulative impact on transit services. (LTS)

The major transit agencies providing service to the SUMC Sites and surrounding area include Caltrain, VTA, SamTrans, and AC Transit. There is also local shuttle service provided by the Cities of Menlo Park and Palo Alto, and Stanford University. As part of their operations, these transit providers adjust service frequencies and distribution of service to meet demand trends. As such, cumulative impacts on transit would be less than significant.

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3.5 AIR QUALITY

Introduction

This section of the EIR evaluates the potential impacts on air quality resulting from construction and operation of the proposed SUMC Project. Standards of impact significance are established on which to base the assessment of air quality impacts. Mitigation measures intended to reduce identified air quality impacts are provided.

Conclusions as to the significance of project and cumulative air quality impacts are based on emission estimates and other modeling performed using data obtained from the application for the SUMC Project[1] the construction equipment phasing, type, duration of use and horsepower rating information provided by the Whiting-Turner Contracting Company,[2] the Transportation Impact Analysis prepared by AECOM Transportation (Appendix C to this EIR),[3] a calculation of vehicle miles travelled (VMT) by AECOM Transportation (Appendix E),[4] and the Health Risk Assessment prepared by ENVIRON International Corporation (ENVIRON; see Appendix F to this EIR).[5] Output from the air quality models used to estimate air pollutant emissions and ambient pollutant concentrations upon which the significance determinations were based are included in Appendix G. Other sources consulted for the preparation of this section include the California Air Resources Board (CARB) Ambient Air Quality Data Summaries and Almanac Emission Projection Data databases, and the Bay Area Air Quality Management District (BAAQMD) *BAAQMD CEQA Guidelines*.[6]

Air quality issues/comments identified in response letters to the NOP and during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project were considered in preparing this analysis. Comments primarily pertained to vehicular emissions and their health impacts. These comments were received from the Palo Alto Planning and Transportation Commission and the Crescent Park Neighborhood Association. This analysis addresses this source of emissions, and also provides general information about the health effects associated with them. Concerns regarding greenhouse gas emissions were also raised. Such greenhouse gas emissions are quantified and addressed in Section 3.6, Climate Change.

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1 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended.

2 Whiting-Turner Contracting Company, Letter from Damon D. Ellis, Re: Stanford University Medical Center Diesel Emissions Study, April 3, 2009.

3 AECOM Transportation, Stanford University Medical Center Environmental Impact Report Transportation Impact Analysis, March 2010.

4 Dennis Struecker, P.E., and Nichole Seow, AECOM Transportation, Memorandum to Trixie Martelino, Stanford EIR - Revised VMT Calculation for SUMC, February 11, 2010.

5 ENVIRON International Corporation, Human Health Risk Assessment Construction and Incremental Operational Emissions Proposed Stanford University Medical Center Facilities Renewal and Replacement Project Palo Alto, California, February 22, 2010.

6 Bay Area Air Quality Management District, *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans*, December 1999.

Existing Conditions

Ambient air quality is influenced by climate, topography, and the quantity and type of pollutants released in an area. The major determinants of transport and dilution of a given pollutant are wind, atmospheric stability, terrain, and sunshine for photochemical pollutants.

Meteorology and Topography

The City of Palo Alto is located within the San Francisco Bay Area Air Basin (SFAB), which includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, the western Solano and southern Sonoma counties. The regional climate of the Bay Area is considered semi-arid and is characterized by warm summers, mild winters, infrequent seasonal rainfall, moderate daytime onshore breezes, and moderate humidity. A wide range of emissions sources—such as dense population centers, heavy vehicular traffic, and industry—and meteorology influences the air quality within the Bay Area.

Air pollutant emissions within the Bay Area are generated by stationary, area-wide and mobile sources. Stationary sources occur at particular identified locations and are usually associated with particular large manufacturing and industrial facilities. Examples include fossil-fuel power plants or large boilers that provide industrial process heat. Area–wide sources consist of many smaller point sources that are widely distributed spatially; examples include residential and commercial water heaters, painting/coating operations, power lawn mower use, agricultural operations, landfills, and the use of consumer products such as barbeque lighter fluid, hair spray, etc. Mobile sources include on-road motor vehicles and other transportation sources like aircraft, ships, trains, and self-propelled construction equipment. Air pollutants can also be generated by natural sources such as fine dust particles suspended in the air by high winds.

The SUMC Sites are located within the San Francisco Peninsula (Peninsula) climate subregion that extends northwest from San Jose to the Golden Gate Bridge. The Santa Cruz Mountains run up the center of the Peninsula, creating an area of warmer temperatures and fewer foggy days to the east where the ridgeline blocks the marine layer. The City of Palo Alto, where the SUMC Sites are located, averages summer high temperatures in the low 80s, and average winter low temperatures in the 30s to low 40s.

Annual average wind speed in this area ranges from 5 to 10 miles per hour with maximum wind speeds of up to 25 miles per hour coming from a westerly to northwesterly wind direction; however, gusts have been recorded annually that reach in excess of 100 miles per hour. The northwest winds are created by the northwest trend of the Coast Range that tends to channel the wind parallel to the coastline. Additional wind patterns come predominantly from the northeast off San Francisco Bay.

Air Pollutants

Criteria Pollutants. Both the federal and State governments have established ambient air quality standards (AAQS) for outdoor concentrations of a number of pollutants to protect the health and welfare of the people most sensitive to their effects. Such pollutants are called “criteria” pollutants, the most common of which are listed below in Table 3.5-1, which includes both federal and State AAQS and the known health effect for these pollutants.

- *Ozone* is a gas that is formed when reactive organic gases (ROG) and nitrogen oxides (NO_x)—both byproducts of internal combustion engine exhaust—undergo slow photochemical reactions in the presence of sunlight. Ozone concentrations are generally highest during the summer months when direct sunlight, light wind, and warm temperature conditions are conducive to its formation.
- *Carbon Monoxide* (CO) is a colorless, odorless gas produced by the incomplete combustion of fuels. CO concentrations tend to be the highest during the winter morning, with little to no wind, when surface-based inversions trap the pollutant at ground levels. Because CO is emitted directly from internal combustion engines—unlike ozone—and motor vehicles operating at slow speeds are the primary source of CO in the Bay Area, the highest ambient CO concentrations are generally found near congested transportation corridors and intersections.
- *Respirable Particulate Matter* (PM_{10}) and *Fine Particulate Matter* ($PM_{2.5}$) consist of extremely small, suspended particles or droplets 10 microns and 2.5 microns or smaller in diameter. Some sources of particulate matter, like pollen and windstorms, are naturally occurring. However, in populated areas, most particulate matter is caused by road dust, combustion products, abrasion of tires and brakes, and construction activities.
- *Sulfur Dioxide* (SO_2) is a colorless, extremely irritating gas or liquid. It enters the atmosphere as a pollutant mainly as a result of burning high sulfur-content fuel oils and coal, and from chemical processes occurring at chemical plants and refineries.
- *Nitrogen Dioxide* (NO_2) is a reactive, oxidizing gas capable of damaging cells lining the respiratory tract and is an essential ingredient in the formation of ozone. It is emitted as a by-product of fuel combustion.
- *Lead* occurs in the atmosphere as particulate matter. The combustion of leaded gasoline is the primary source of airborne lead in the Bay Area. The use of leaded gasoline is no longer permitted for on-road motor vehicles so most such combustion emissions are associated with off-road vehicles such as race cars. Other sources of lead include the manufacturing and recycling of batteries, paint, ink, ceramics, ammunition, and secondary lead smelters.

Table 3.5-1
State and Federal Criteria Air Pollutant Standards, Effects, and Sources

		State Standard[a]		Federal Standard[b]			
Pollutant	**Averaging Time**	**Concentration**	**Attainment Status**	**Concentration**	**Attainment Status**	**Pollutant Health and Atmospheric Effects**	**Major Pollutant Sources**
Ozone	1-Hour 8-Hour	0.09 ppm 0.070 ppm	N N	—[c] 0.075 ppm	—[c] N	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when reactive organic gases and NO_X react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial industrial mobile equipment.
Carbon Monoxide	1-Hour 8-Hour	20 ppm 9.2 ppm	A A	35 ppm 9 ppm	A A	Classified as a chemical asphyxiate, CO interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
Nitrogen Dioxide	1-Hour Annual	0.18 ppm 0.030 ppm	A A	— 0.053 ppm	A A	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
Sulfur Dioxide	1 Hour 24-Hour Annual	0.25 ppm 0.04 ppm	A A	— 0.14 ppm 0.030 ppm	 A A	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
Particulate Matter (PM_{10})	24 Hour Annual	50 $\mu g/m^3$ 20 $\mu g/m^3$	N N	150 $\mu g/m^3$ 50 $\mu g/m^3$	U A	May irritate eyes and respiratory tract, decreases in lung capacity, cancer, and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).

Table 3.5-1
State and Federal Criteria Air Pollutant Standards, Effects, and Sources

Pollutant	Averaging Time	State Standard[a] Concentration	State Standard[a] Attainment Status	Federal Standard[b] Concentration	Federal Standard[b] Attainment Status	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Fine Particulate Matter ($PM_{2.5}$)	24 Hour Annual	— 12 $\mu g/m^3$	 N	65 $\mu g/m^3$ 15 $\mu g/m^3$	A A	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning. Also formed from photochemical reactions of other pollutants, including NO_X, SO_2, and organics.
Lead	Monthly Quarterly	1.5 $\mu g/m^3$	A	— 1.5 $\mu g/m^3$	 A	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction.	Present source: lead smelters, battery manufacturing and recycling facilities. Past source: combustion of leaded gasoline.

Source: BAAQMD internet site http://www.baaqmd.gov/pln/air_quality/ambient_air_quality.htm, accessed February 14, 2008.

Notes:

A = Attainment

N = Nonattainment

U = Unclassified (insufficient data collected to determine classification; generally indicates low concern for the pollutant levels)

ppm = parts per million

$\mu g/m^3$ = micrograms per cubic meter

a. California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter - PM_{10}, and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, Lake Tahoe CO, lead, hydrogen sulfide, and vinyl chloride are not to be equaled or exceeded. If the standard is for a 1-hour, 8-hour, or 24-hour average (i.e., all standards except for lead and the PM_{10} annual standard), then some measurements may be excluded. In particular, measurements are excluded that the California Air Resources Board determines would occur less than once per year on the average. The Lake Tahoe CO standard is 6.0 ppm, a level one-half the national standard and two-thirds the state standard.

b. Federal standards other than for ozone, particulates and those based on annual averages are not to be exceeded more than once a year. The 1-hour ozone standard is attained if, during the most recent 3-year period, the average number of days per year with maximum hourly concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the 4th highest daily concentrations is 0.08 ppm or less. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile of monitored concentrations is less than 150 $\mu g/m^3$. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of 98th percentiles is less than 65 $\mu g/m^3$.

c. The federal 1-hour ozone standard was revoked on June 15, 2005.

Toxic Air Contaminants (TACs). "Toxic air contaminants" is a general term for a diverse group of air pollutants that can adversely affect human health. They are not fundamentally different from the criteria pollutants, but they have not had ambient air quality standards established for them for a variety of reasons (e.g., insufficient dose-response data, association with particular workplace exposures rather than general environmental exposure, etc.). The health effects of TACs can result from either acute or chronic exposure; many types of cancer are associated with chronic TAC exposures.

Significant sources of TACs in the environment are industrial processes, such as petroleum refining, chemical manufacturing, electric utilities, metal mining/refining and chrome plating; commercial operations, such as gasoline stations and dry cleaners; and transportation activities, particularly diesel-powered vehicles, including trains, buses, and trucks. In 1998, the CARB identified particulate matter from diesel-powered engines as a TAC. Compared to other air toxics that the CARB has identified and controlled, diesel particulate matter (DPM) emissions are estimated to be responsible for about 70 percent of the total ambient air toxics risk. On a statewide basis, the average potential cancer risk associated with these emissions is over 500 potential cases per million.[7]

Air Quality

Regional. With the assistance of the BAAQMD, the CARB compiles inventories of CO, reactive organic gases (ROG), which are ozone precursors, NO_2, PM_{10}, and $PM_{2.5}$ emissions for the Bay Area. Table 3.5-2 presents a summary of the most recent year of emissions data for the SFAB and Santa Clara County.

The SUMC Sites are in the SFAB. This air basin has a history of recorded violations of federal and State AAQS for ozone, CO, and PM_{10} during the past 30 years. Since the early 1970s, substantial progress has been made toward controlling these pollutants. As a result, the Bay Area is in attainment for all State and federal standards except those for ozone, PM_{10}, and $PM_{2.5}$. For ozone, the SFAB does not meet either the State or federal standards. For PM_{10} and $PM_{2.5}$, the SFAB does not meet the State standards but does meet the federal standards

The BAAQMD has estimated that the carcinogenic health risks from exposure to DPM in 2002 in the Bay Area region was about 440 in a million.[8] Most of the DPM risks are from exposure to exhaust from diesel trucks where the emission sources can be relatively close to receptors at businesses and residences near freeways.

Local. The BAAQMD operates many air quality monitoring stations throughout the SFAB. The closest monitoring station to the SUMC Sites is the Redwood City station, which is located approximately 6 miles away. Table 3.5-3 shows recent data taken at this monitoring station (i.e., 2005 through 2007).

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7 California Air Resources Board, *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*, October 2000.

8 BAAQMD, *Toxic Air Contaminants 2002 Annual Report*, 2004.

Table 3.5-2
San Francisco Air Basin and Santa Clara County
Criteria Pollutant Emissions Inventory and Projections,
2008 (Tons/Day - Annual Average)

	CO	ROG	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Bay Area						
2008 Estimated						
Total Emissions	1747.7	988.8	448.0	61.5	212.1	81.3
On-Road Motor Vehicle Emissions	1066.7	112.3	206.7	0.9	10.1	7.1
Santa Clara County						
2008 Estimated						
Total Emissions	423.4	93.2	91.3	1.5	50.1	16.5
On-Road Motor Vehicle Emissions	260.4	27.8	45.8	0.2	2.7	1.7

Source: CARB, *Almanac Emission Projection Data*, http://www.arb.ca.gov/app/emsinv/emssumcat.php, accessed March 2010.

Table 3.5-3
Summary of Local Ambient Air Quality in the Project Vicinity

	Year		
Air Pollutants[a]	**2007**	**2006**	**2008**
Ozone			
Maximum 1-hour concentration measured[b]	0.08 ppm	0.09 ppm	0.08 ppm
Days exceeding State 0.09 ppm 1-hour standard	0	0	0
Maximum 8-hour concentration measured[c]	0.07 ppm	0.06 ppm	0.07 ppm
Days exceeding federal 0.08 ppm 8-hour standard	0	0	0
Respirable Particulate Matter (PM_{10})			
Maximum 24-hour concentration measured[d]	52.2 $\mu g/m^3$	66.2 $\mu g/m^3$	38.2 $\mu g/m^3$
Days exceeding federal 150 $\mu g/m^3$ 24-hour standard	0	0	0
Days exceeding State 50 $\mu g/m^3$ 24-hour standard	1	2	0
Fine Particulate Matter ($PM_{2.5}$)			
Maximum 24-hour concentration measured	45.4 $\mu g/m^3$	75.3 $\mu g/m^3$	36.0 $\mu g/m^3$
No. of days exceeding federal 35 $\mu g/m^3$ 24-hour standard[e]	1	1	0
Carbon Monoxide (CO)			
Maximum 8-hour concentration measured	2.3 ppm	2.4 ppm	1.7 ppm
Number of days exceeding federal and State 9.0 ppm 8-hour standard	0	0	0
Nitrogen Dioxide (NO_2)			
Maximum 1-hour concentration measured	0.06 ppm	0.07 ppm	0.07 ppm
Days exceeding State 0.25 ppm 1-hour standard	0	0	0

Source: CARB, *Ambient Air Quality Data Summaries, Air Pollution Summary*, 2006 through 2008.
Notes:
a. Data is taken from the Redwood City monitoring station.
b. ppm = parts by volume per million of air.
c. The California 8-hour ozone standard was implemented on May 17, 2005.
d. $\mu g/m^3$ = micrograms per cubic meter.
e. On December 17, 2006, the U.S. EPA implemented a more stringent federal 24-hour $PM_{2.5}$ standard revising it from 65 $\mu g/m^3$ to 35 $\mu g/m^3$. $PM_{2.5}$ exceedance days for 2005 to 2007 reflect the new 35 $\mu g/m^3$ standard.

During this period at this station, the State 1 hour ozone standard and the federal 1 hour and 8 hour standards were not exceeded, the State 24 hour PM_{10} standard was exceeded five times compared with none for the federal 24 hour standard, and the federal 24 hour standard for $PM_{2.5}$ standard was exceeded once.

The BAAQMD measures ambient levels of TACs at a number of monitoring stations in the region. The station nearest the SUMC Sites is in Redwood City. Table 3.5-4 summarizes monitored concentrations of carcinogenic TACs for 2002, the most recent year for which data are available.

Table 3.5-4
Ambient Concentrations of Carcinogenic TACs
Measured in the Project Vicinity by the BAAQMD

Compound	Concentration (ppb)[a]	Concentration ($\mu g/m^3$)[b]	Unit Risk (per $\mu g/m^3$)[b]	Cancer Risk (Chances in 1 million)
Redwood City Station				
Benzene	0.63	2.05	2.90E-05	59.4
Carbon Tetrachloride	0.11	0.71	4.20E-05	29.8
Chloroform	0.04	0.20	5.30E-06	1.1
Methylene Chloride	0.27	0.95	1.00E-06	1.0
Ethylene Dibromide	0.01	0.08	7.10E-05	5.7
Ethylene Dichloride	0.05	0.21	2.10E-05	4.4
MTBE	0.91	3.33	2.60E-07	0.9
Perchloroethylene	0.05	0.34	5.90E-06	2.0
Trichloroethylene	0.16	0.88	2.00E-06	1.8
Vinyl Chloride	0.15	0.39	7.80E-05	30.4

Source: BAAQMD, *Toxic Air Contaminants 2002 Annual Report,* June 2004.
Notes:
a. ppb = parts per billion.
b. $\mu g/m^3$ = micrograms per cubic meter.

Applicable Plans and Regulations

Air quality within the Bay Area is addressed through the efforts of various federal, State, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for improving the air quality within the Bay Area are discussed below.

Federal. The U.S. Environmental Protection Agency (EPA) is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS). The EPA requires each state where the NAAQS are exceeded to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the NAAQS. The SIP must integrate federal, State, and local plan components and regulations to identify specific measures to reduce pollution, using a combination of performance standards and market-based programs within the timeframe identified in the SIP.

State. The CARB, a part of the California EPA, is responsible for the coordination and administration of both federal and State air pollution control programs within California. In this capacity, CARB conducts research, sets California Ambient Air Quality Standards (AAQS), compiles emission inventories, develops suggested control measures, provides oversight of local programs, and prepares the SIP. CARB establishes emissions standards for motor vehicles sold in California, consumer products (e.g., hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

The Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588) requires stationary sources to report the types and quantities of over 200 TACs routinely released into the air. It is the primary toxic air contaminant legislation in the State. Under the Act, local air districts may request that a facility account for its TAC emissions. Local air districts then prioritize facilities on the basis of emissions, and high- priority designated facilities are required to submit a health risk assessment and communicate the results to the affected public. The TAC control strategy involves reviewing new sources to ensure compliance with required emission controls and limits, maintaining an inventory of existing sources of TACs, and developing new rules and regulations to reduce TAC emissions. The goals of the Air Toxics Hot Spots Act are to collect emission data, identify facilities having localized impacts, ascertain health risks, notify nearby residents of significant risks, and reduce those significant risks to acceptable levels.[9]

The *Air Quality and Land Use Handbook: A Community Health Perspective* (2005) provides CARB recommendations for the siting of new sensitive land uses (i.e., residences, schools, daycare centers, playgrounds, and medical facilities) near recognized major sources of TACs (e.g., freeways, large warehouses/distribution centers, rail yards, etc.). Recommendations contained in the Handbook are voluntary; they do not constitute a requirement or mandate either for land use agencies or local air districts.

Local. The BAAQMD is the primary agency responsible for comprehensive air pollution control in the SFAB, including Santa Clara County. To that end, the BAAQMD, a regional agency, works directly with the Association of Bay Area Governments, the Metropolitan Transportation Commission, and local governments and cooperates actively with all federal and State government agencies. The BAAQMD develops rules and regulations, establishes permitting requirements for stationary sources, inspects emissions sources, and enforces such measures through educational programs or fines, when necessary.

The BAAQMD is directly responsible for reducing emissions from stationary (area-wide and point) sources and for assuring that State controls on mobile sources are effectively implemented. It has responded to this requirement by preparing a sequence of *Ozone Attainment Plans* and *Clean Air Plans* that comply with the federal Clean Air Act and the California Clean Air Act to accommodate growth, reduce the pollutant levels in the Bay Area, meet federal and State AAQS, and minimize the fiscal impact that pollution control measures have on the local economy. The *Ozone Attainment Plans* are

[9] California Air Resources Board, *AB 2588 Air Toxics 'Hot Spots' Program,* (November 13, 2008), http://www.arb.ca.gov/ab2588/ab2588.htm.

prepared for the federal ozone standard, and the Clean Air Plans are prepared for the State ozone standards. The most recent *Ozone Attainment Plan* was adopted by the BAAQMD Board of Directors on October 2001 and demonstrates attainment of the federal ozone standard in the Bay Area by 2006. The current regional *Clean Air Plan* was adopted by the Board of Directors on December 20, 2000. It identifies the control measures that would be implemented through 2006 to reduce major sources of pollutants. These planning efforts have substantially decreased the population's exposure to unhealthful levels of pollutants, even while substantial population growth has occurred within the Bay Area. The *Clean Air Plan* predicts that regional ozone concentrations will decrease by 1.2 percent per year or 9.0 percent over the 12 years after it was adopted.

In 2003, the California Legislature enacted Senate Bill 656 (SB 656) to reduce public exposure to PM_{10} and $PM_{2.5}$. SB 656 requires CARB, in consultation with local air districts, to develop and adopt, by January 1, 2005, a list of the most readily available, feasible, and cost-effective control measures that could be used by CARB and the air districts to reduce PM_{10} and $PM_{2.5}$. In November 2005, the BAAQMD adopted a *Particulate Matter Implementation Strategy* focusing on those measures most applicable and cost effective for the Bay Area.

Although the BAAQMD is responsible for regional air quality planning efforts, it does not have the authority to directly regulate the air quality issues associated with plans and new development projects within the Bay Area. Instead, the BAAQMD has used its expertise and prepared/adopted the *BAAQMD CEQA Guidelines* (1999) to assist Lead Agencies, as well as development project proponents, environmental consultants and other interested parties in evaluating potential air quality impacts of projects and plans proposed in the Bay Area. The *BAAQMD CEQA Guidelines* provide direction on how to evaluate potential air quality impacts, how to determine whether these impacts are significant, and how to mitigate these impacts. By providing this guidance, the BAAQMD promotes accurate and consistent air quality analysis throughout the SFAB, with consequent minimization of adverse air quality impacts.

The BAAQMD is in the process of updating its CEQA Guidelines. Since the 1999 *BAAQMD CEQA Guidelines* were issued, criteria pollutant ambient air quality standards have become more stringent and new federal and State standards have been adopted for $PM_{2.5}$. Also, TACs health effects have been found to be worse than previously thought and certain Bay Area communities have been found to be disproportionally impacted from high concentrations of TACs. Another significant issue that has emerged since the last Guidelines revision is the growing concern with global climate change. The greenhouse gas emissions reductions needed to stabilize global atmospheric temperature increases have been found to be quite substantial and the consequences of a failure to reduce such emissions are considered more dire. Thus, the BAAQMD has undertaken a review all of its currently-recommended CEQA methodologies and thresholds, revising and/or developing new ones as appropriate, with the overall goal of reducing/avoiding local, regional and global air quality impacts.

The proposed *Draft BAAQMD CEQA Guidelines,* the update to the 1999 *BAAQMD CEQA Guidelines* are currently under development and open to comment by local government agencies and the public; they are expected to be considered for adoption by the BAAQMD Board of Directors in June 2010. The Impact Assessment and Mitigation Measures section below provides a summary of the Standards of Significance pertaining to criteria pollutants recommended by the current *BAAQMD CEQA Guidelines*, which are used for determinations of significance in this EIR. However, the revised Standards of Significance from the proposed *Draft BAAQMD CEQA Guidelines* are presented for informational purposes in the following analysis of the SUMC Project's construction and operational criteria pollutant emissions.

Impacts and Mitigation Measures

Standards of Significance

Based on significance thresholds as recommended in the *BAAQMD CEQA Guidelines* (1999) and adopted by the City of Palo Alto, the SUMC Project would result in a significant air quality impact if it would:

- Conflict with or obstruct implementation of the 2000 Clean Air Plan, the 2001 Ozone Attainment Plan, or the 2005 Bay Area Ozone Strategy or violate an ambient air quality standard or contribute substantially to an existing or projected air quality violation as demonstrated by the following:
  1. Direct and/or indirect operational emissions that exceed the BAAQMD criteria air pollutants of 80 pounds per day or 15 tons per year for NO_x, ROG, and PM_{10}; and
  2. CO concentrations exceeding the State AAQS of 9 parts per million (ppm) averaged over 8 hours or 20 ppm for 1 hour (as demonstrated by CALINE4 modeling, which would be performed when a) project CO emissions exceed 550 pounds per day or 100 tons per year; or b) project traffic would impact intersections or roadway links operating at Level of Service (LOS) D, E, or F or would cause LOS to decline to D, E, or F; or c) project would increase traffic volumes on nearby roadways by 10 percent or more).
- Create objectionable odors affecting a substantial number of people.
- Expose sensitive receptors or the general public to substantial levels of TACs where:
  1. Probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeds 10 in one million; and
  2. Ground-level concentrations of non-carcinogenic TACs would result in a hazard index greater than one (1) for the MEI.
- Not implement all applicable construction PM_{10} emission control measures (recommended in the *BAAQMD CEQA Guidelines* Table 2).

Methodology for Analysis

The methodologies and thresholds discussed below are currently recommended by the BAAQMD in the *BAAQMD CEQA Guidelines* to determine the significance of air quality impacts.

Construction Emissions. The pollutants of primary concern during construction of the SUMC Project would be PM_{10}, a component of the dust that would be emitted in the largest quantities during grading and earth-moving activities, and DPM in the diesel-powered equipment exhaust. Construction-related emissions are temporary, but may still cause adverse air quality impacts. Emissions during construction phases are analyzed according to *BAAQMD CEQA Guidelines*, and recommendations for implementation of control measures are presented in Impact AQ-1.

For PM_{10} produced by the movement of earth and equipment travel over unpaved ground during construction, the BAAQMD's approach to analyses of construction impacts is to emphasize implementation of effective and comprehensive control measures for PM_{10} rather than detailed quantification of emissions. The BAAQMD has developed feasible PM_{10} control measures for construction activities. The *BAAQMD CEQA Guidelines* state that a determination of significance for PM_{10} from construction activity should be based on a project's implementation of these control measures.[10] However, air pollutant emissions in the construction equipment exhaust are nonetheless estimated here using the CARB's off-road diesel equipment emission rates (established in CCR Article 48, Section 2449) and the URBEMIS 2007 computer model, together with project-specific equipment use and schedule data provided by the project sponsor, to evaluate construction period ozone precursor emissions (i.e., ROG and NO_x) for comparison with BAAQMD thresholds and to estimate TAC emissions (i.e., PM_{10} and $PM_{2.5}$ as indicators of equipment DPM emissions) for the Health Risk Assessment (see Appendix F). The same construction equipment use and schedule data were also used for estimating construction-phase greenhouse gas emissions (see Section 3.6, Climate Change). The estimated average daily and annual amounts of ROG NO_X, $PM_{10,}$ and $PM_{2.5}$ from construction equipment used for the SUMC Project is presented in Impact AQ-1.

Emissions of ozone precursors (ROG and NO_X) from construction equipment exhaust are included by the BAAQMD in the emission inventory that is the basis for regional air quality planning and are not considered to be a major impediment to regional attainment or maintenance of the ozone AAQS. Nevertheless, these emissions were estimated for the SUMC Project and are presented in Impact AQ-1 below.

Operational Emissions. The BAAQMD recommends that a project with operational emissions that exceed any of the following daily or annual thresholds be considered significant.[11] These thresholds apply to the operational emissions associated with individual projects only; they do not apply to

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10 BAAQMD, *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans*, December 1999, p. 12.

11 BAAQMD, *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans*, December 1999, p. 16.

construction-related emissions. The operational emissions from individual projects that exceed these thresholds are also considered to be cumulatively significant by the BAAQMD.

- 80.0 pounds per day (ppd) or 15 tons per year (tpy) of ROG
- 80.0 ppd or 15 tpy of NOx
- 80.0 ppd or 15 tpy of PM_{10}

Operational emissions of CO are considered significant if they would cause or contribute to violations of the federal or State ambient air quality standards for CO (i.e., 35 ppm and 20 ppm, respectively, for 1-hour averages; 9 ppm for 8-hour averages).

TAC Emissions. The methods used to analyze the human health effects from project-related construction emissions of DPM were developed consistent with CEQA Guidelines and with BAAQMD, California Environmental Protection (CAL EPA), and U.S. Environmental Protection Agency (EPA) risk assessment guidance. The analysis incorporates conservative (i.e., health-protective) methodologies for the following: 1) the estimation of emissions, 2) the calculation of airborne concentrations at receptor locations, and 3) the estimation of excess lifetime cancer risks and non-cancer health effects or hazard indices (HIs).

Offsite receptors in the vicinity of the SUMC Sites include residents (child and adult), workers and sensitive receptors (school children) located in the surrounding community and along the expected travel routes of on-road delivery and haul trucks. Onsite receptors include SUMC workers.

Airborne concentrations of potential carcinogenic and non-carcinogenic human health risks from DPM were estimated at receptor locations using the emissions estimates and the EPA recommended air dispersion model American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD), version 07026. Based on the results of the exposure evaluation and air dispersion modeling, quantitative estimates of excess lifetime cancer risks and non-cancer HIs associated with potential exposure to SUMC Project-related emissions were developed. The methods used to estimate excess lifetime cancer risks and non-cancer HIs are consistent with risk assessment guidance from BAAQMD, CAL EPA, and EPA (see Appendix F).

Operational TAC emissions from the emergency diesel generators and medical helicopter operations associated with the SUMC Project were also estimated together with their associated health risks as part of the Health Risk Assessment (see Appendix F).

Odor Emissions. Although objectionable operations-related odors rarely cause physical harm, they still can be unpleasant. The BAAQMD CEQA Guidelines recommends that any project that has the potential to expose members of the public frequently to objectionable odors be considered to have a significant impact. Odor impacts on residential areas and other sensitive receptors warrant the closest scrutiny, but consideration should also be given to other land uses where people may congregate.

Environmental Analysis

AQ-1. Construction Criteria Air Pollutant Emissions. Without mitigation, construction activities associated with the SUMC Project could cause emissions of dust and pollutants from equipment exhaust that could contribute to existing air quality violations or expose sensitive receptors to substantial pollutant concentrations. Impacts would be significant. (S)

Construction of the SUMC Project is anticipated to occur consecutively for approximately 12 years. Approximately 1.2 million square feet of buildings and related paved areas would be demolished. Construction activities would include site preparation, grading, placement of infrastructure, placement of foundations for structures, and fabrication of structures. Demolition and construction activities would require the use of heavy trucks, excavating and grading equipment, concrete breakers, concrete mixers, and other mobile and stationary construction equipment. Emissions during construction would be caused by material handling, traffic on unpaved or unimproved surfaces, demolition of structures, use of paving materials and architectural coatings, exhaust from construction worker vehicle trips, and exhaust from diesel-powered construction equipment.

Heavy construction activity on dry soil exposed during construction phases would cause emissions of dust (PM_{10} being the air pollutant component of greatest concern). ROG, NO_X, PM_{10} and $PM_{2.5}$ emissions also would result from the combustion of fuel by construction equipment and construction worker vehicles. Throughout construction, pollutant emissions would vary day-to-day and year-to-year depending on the specific construction phase in progress.

When considered in the context of long-term project operations, demolition and construction-related emissions of criteria pollutants would be temporary, but, given the duration and scale of the SUMC Project and the fact that construction emissions would overlap with emissions from SUMC Project operations, emissions of ROG, NO_x, PM_{10} and $PM_{2.5}$ from the construction equipment have the potential for significant effects on local and regional air quality. The construction emissions from the SUMC Project have been quantified in Table 3.5-5.

The *BAAQMD CEQA Guidelines* set no quantitative significance thresholds for construction emissions. However, if guidelines operational thresholds (80 lbs/day or 15 tons/year) were applied to construction emissions, project NOx emissions would exceed the 80 lbs/day threshold during the first year of construction. Construction emissions would generally decrease from year to year as the SUMC Project construction program proceeds. This would be the case to some degree because construction activity would taper off as more and more of the structural components of the SUMC Project are completed, but more importantly because the construction equipment would emit less pollutants in future years as controls mandated for off-road diesel-powered equipment under California law phase-in over time.[12]

[12] California Code of Regulations, Article 4.8, Section 2449, General Requirements for In-Use Off-Road Diesel-Fueled Fleets.

Table 3.5-5
SUMC Project Construction Equipment Exhaust Emissions[a]

Emission Year	Pollutant Emissions (Pounds per Day/Tons per Year)			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
2010	14.5/1.9	**85.3**/11.1	3.79/0.49	3.52/0.46
2011	12.1/1.6	70.9/9.2	3.14/0.41	2.92/0.38
2012	7.3/1.0	43.2/5.6	1.76/0.23	1.55/0.20
2013	4.5/0.6	26.3/3.4	1.07/0.14	0.97/0.13
2014	5.2/0.7	30.9/4.0	1.17/0.15	1.05/0.14
2015	4.2/0.5	24.7/3.2	0.90/0.12	0.85/0.11
2016	0.5/0.1	2.8/0.4	0.07/0.01	0.06/0.01
2017	1.9/0.3	11.4/1.5	0.30/0.04	0.26/0.03
2018	3.1/0.4	18.4/2.4	0.50/0.06	0.46/0.06
2019	3.1/0.4	18.4/2.4	0.50/0.06	0.46/0.06
2020	1.7/0.2	9.7/1.3	0.21/0.03	0.18/0.02
2021	1.4/0.2	8.2/1.1	0.19/0.02	0.16/0.02

Source: PBS&J, 2010.

Note:

a. Estimates are results of modeling using CARB's off-road diesel equipment emission rates (established in CCR Article 48, Section 2449) and the URBEMIS 2007 computer model, together with project-specific equipment use and schedule data provided by the Whiting-Turner Contracting Company.

Comparison of SUMC Project Construction Emissions with the Proposed *Draft BAAQMD CEQA Guidelines*. The proposed *Draft BAAQMD CEQA Guidelines* establish quantitative significance criteria for construction equipment pollutant exhaust emissions: 54 lbs/day for ROG, NO_x, and $PM_{2.5}$ and of 82 lbs/day for PM_{10}. If these thresholds are adopted, the SUMC Project would exceed the proposed NO_x threshold during the first two years of construction However, construction-period NO_x emission would decline below the revised threshold in subsequent years of construction as construction activity tapers off and more stringent emissions standards for construction equipment phase in over time. The mitigation measures identified below could not guarantee the emissions would not be reduced below the new threshold, however, and impacts would be significant and unavoidable under the proposed *Draft BAAQMD CEQA Guidelines*. This discussion is provided for informational purposes, and the conclusions in the EIR are based on the currently adopted 1999 *BAAQMD CEQA Guidelines*.

In addition to emitting criteria pollutants, construction activity has the potential to emit asbestos. Demolition activities that could have the potential to encounter asbestos-containing materials would be required to comply with BAAQMD Regulation 11, Rule 2 for the control of emissions (see Section 3.12, Hazardous Materials for a further discussion of asbestos requirements). This regulatory program minimizes potential effects related to airborne asbestos. As discussed in more detail in Section 3.12, Hazardous Materials, asbestos emissions from demolition would be less than significant with the implementation of the recommended mitigation measures.

MITIGATION MEASURES. To minimize dust emissions, the BAAQMD has identified a set of feasible PM_{10} control measures for all construction activities in the air basin. Implementation of the BAAQMD-recommended measures (Mitigation Measure AQ-1.1 below) would reduce the impacts caused by construction dust to a less-than-significant level. Additionally, implementation of construction equipment emission reduction measures (Mitigation Measure AQ-1.2 below) would further reduce NOx, ROG, PM_{10} and $PM_{2.5}$ emissions during construction compared with the estimates of construction equipment emissions given in Table 3.5-5. However, reduction of NOx emissions below 80 lbs/day during the first year of construction could not be guaranteed, and this impact would still be considered significant and unavoidable. Mitigation Measures AQ-1.1 and AQ-1.2 have been developed as part of this analysis to reduce impacts, in consideration of *BAAQMD CEQA Guidelines*. (SU)

AQ-1.1 *Implement Recommended Dust Control Measures*. To reduce dust emissions during project demolition and construction phases, the SUMC Project sponsors shall require the construction contractors to comply with the dust control strategies developed by the BAAQMD. The SUMC Project sponsors shall include in construction contracts the following requirements:

a. Cover all trucks hauling soil, sand, and other loose materials including demolition debris, or require all trucks to maintain at least two feet of freeboard;

b. Water all active construction areas (exposed or disturbed soil surfaces) at least twice daily;

c. Use watering to control dust generation during demolition of structures or break-up of pavement;

d. Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved parking areas and staging areas;

e. Sweep streets daily (with water sweepers) all paved access roads, parking areas and staging areas during the earthwork phases of construction;

f. Sweep daily (with water sweepers) if visible soil material is carried onto adjacent public streets;

g. Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more);

h. Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.);

i. Limit traffic speeds on unpaved roads to 15 mph;

j. Install sandbags or other erosion control measures to prevent silt runoff to public roadways; and

k. Replant vegetation in disturbed areas as quickly as possible.

AQ-1.2 *Implement Equipment Exhaust Emission Reduction Measures*. To reduce emissions from construction equipment during project demolition and construction phases, the SUMC Project sponsors shall require the construction contractors to comply with the following emission reduction strategies to the maximum feasible extent. The SUMC Project sponsors shall include in construction contracts the following requirements:

a. Where possible, electrical equipment shall be used instead of fossil-fuel powered equipment.

b. The contractor shall install temporary electrical service whenever possible to avoid need for fossil-fuel powered equipment.

c. Running equipment not being actively used for construction purposes for more than five minutes shall be turned off. (e.g., trucks waiting to deliver or receive soil, aggregate, or other bulk materials; however, rotating-drum concrete trucks may keep their engines running continuously as long as they are on site).

d. Trucks shall be prohibited from idling while on residential streets serving the construction site (also included in Mitigation Measure NO-1.1).

e. Diesel-powered construction equipment shall be Tier III or Tier IV CARB certified equipment to the maximum feasible extent.

f. The engine size of construction equipment shall be the smallest practical to accomplish the task at hand.

AQ-2. Operational Criteria Air Pollutant Emissions. Combined mobile and stationary source emissions during operation of the SUMC Project would exceed the Bay Area Air Quality Management District's significance threshold of 80 pounds/day of ROG, NO_X *and* PM_{10}. *Therefore, air emissions would result in a substantial contribution to an existing regional air quality problem and a significant impact. (S)*

Mobile Source Emissions. The SUMC Project would result in an increase in traffic from current conditions. According to the Transportation Impact Analysis for the SUMC Project (Appendix C), 2025 full buildout of the SUMC Project would result in an additional 10,061 daily trips. As described in Section 3.4, Transportation, the SUMC Project sponsors currently implement a Transportation Demand Management (TDM) program. The TDM program includes efforts to encourage transit, bicycle and pedestrian modes of travel, and to discourage use of single occupant vehicles by hospital and SoM employees. This currently implemented TDM program would continue to be implemented during SUMC Project operation and is accounted for in the SUMC Project trip generation.

The estimated 10,061 increase in daily trips have an overall average trip length of 27.4 miles (for SUMC patients and employees). The increase in daily trips and VMT under the SUMC Project was calculated by AECOM Transportation[13] based on the commuting patterns of existing employees and patients (see Appendix E). The SUMC Project's VMT would be 275,837 daily vehicle miles. The VMT calculations assume that 60 percent of the daily trips are made by patients and 40 percent made by employees. Using employee and patient origin data (zip codes) provided in the project application, distances from these origins to the SUMC Site were estimated and the average trip length determined.

The URBEMIS 2007 model was used to calculate the emissions associated with increased trips and VMT to and from the SUMC Project. URBEMIS outputs are provided in Appendix G. For purposes of this analysis, all trips associated with the SUMC Project were assumed to be new trips within the air basin, although some portion of the trips attributed to the SUMC Project would likely occur whether or not the SUMC Project is constructed (i.e., those in need of medical treatment likely would seek treatment elsewhere in the Bay Area if the SUMC facilities were not expanded). Thus, the SUMC Project emission estimate represents an upper bound on potential new emissions from mobile sources.

Stationary Source Emissions. The SUMC Project would generate criteria pollutant emissions from on-site combustion of natural gas for space and water heating and of other fuels by building and grounds maintenance equipment. Other such emissions would result from increased demands of the SUMC Project on the boilers and chillers at Stanford's Central Energy Facility (CEF) and from the periodic testing of the emergency generators. The emission estimates of on-site fuel combustion sources associated with SUMC were provided by the URBEMIS 2007 model based the choice of hospital and medical office uses as defined in Section 2, Project Description. URBEMIS outputs are provided in Appendix G. Emissions associated with the increased demand the SUMC Project would make on the CEF were provided by the SUMC Project sponsors.[14]

Criteria pollutant emissions associated with the operation of the emergency generators were not estimated because they would not be operated daily, but only for short periods at infrequent intervals for testing (however, their TAC emissions were estimated and those impacts are part of the Health Risk Assessment, discussed under Impact AQ-4). The SUMC Project facilities also would use larger amounts of electricity, which would result in increased criteria pollutant emissions associated with operations of power plants supplying that electricity. Since most of the electricity used in the Bay Area is produced by power plants located elsewhere, the criteria pollutants they produce would have very little effect on the SFAB, and so their emissions were not estimated.

13 Dennis Struecker, P.E., and Nichole Seow, AECOM Transportation, Memorandum to Trixie Martelino, Stanford EIR - Revised VMT Calculation for SUMC, February 11, 2010.

14 Stanford University Land Use and Environmental Planning, email from Catherine Palter, Subject: SUMC criteria pollutant emissions, May 13, 2009.

Total Emissions. As shown in Table 3.5-6, SUMC stationary and mobile sources would emit ROG, NO_X and PM_{10} in excess of the BAAQMD 80-pounds per day (15 tons per year) significance thresholds. Thus, the SUMC Project emissions of ROG, NO_X and PM_{10} would be significant. These emissions would be mostly from SUMC mobile sources. Emissions from stationary sources would be below the thresholds, except for NOx emissions from the CEF.

Table 3.5-6
SUMC Project Daily Operational Stationary and Mobile Source Emissions (without Mitigation)

	Emissions (Pounds per Day/Tons per Year)					
Emission Source	**ROG**	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Stationary (On-Site)	5.67/1.04	5.86/1.07	6.45/1.18	0.00/0.00	0.02/0.00	0.02/0.00
Central Energy Facility	----	110/20.08	37/6.75	----	----	----
Mobile	90.95/ 15.97	110.00/ 18.74	1027.81/ 189.00	2.42/ 0.40	471.56/ 86.06	88.60/ 16.17
Total Emissions	**96.62/ 17.01**	**225.86/ 39.89**	**1071.26/ 196.93**	**2.42/ 0.40**	**471.58/ 86.06**	**88.62/ 16.17**
BAAQMD Thresholds	**80/15**	**80/15**	**NT**	**NT**	**80/15**	**NT**
Significant Impact?	**Yes/Yes**	**Yes/Yes**	**NT**	**NT**	**Yes/Yes**	**NT**

Source: PBS&J, 2010. Based on year 2025 emission factors.

Notes:

NT = No threshold.

Estimates are results of modeling using the CARB URBEMIS 2007 version 9.2.4.

Comparison of SUMC Project Operational Criteria Pollutant Emissions with the Proposed Draft BAAQMD CEQA Guidelines. The proposed Draft BAAQMD CEQA Guidelines establish the following quantitative significance criteria for project total operational emissions: 54 lbs/day or 10 tons/year for ROG, NO_x, and $PM_{2.5}$ and of 82 lbs/day or 15 tons/year for PM_{10}. If these thresholds are adopted, the SUMC Project would exceed all the proposed thresholds. The mitigation measures identified below could not guarantee the emissions would be reduced below the new thresholds, however, and impacts would be significant and unavoidable under the proposed Draft BAAQMD CEQA Guidelines. This discussion is provided for informational purposes, and the conclusions in the EIR are based on the currently adopted BAAQMD CEQA Guidelines

MITIGATION MEASURES. Continued implementation of the current TDM program is included as part of the SUMC Project for existing employees at the hospitals and the increase in employees that would result from the SUMC Project. However, as indicated in Section 3.4, Transportation, enhanced TDM measures are identified as mitigation measures. Mitigation Measure TR-2.3 in Section 3.4, Transportation, involves implementation of enhanced TDM measures. The enhanced TDM measures include provision of the Caltrain GO Pass to SUMC employees, or an equivalent TDM measure. If the GO Pass would be provided, then remote parking spaces at the Ardenwood Park and Ride Lot in the East Bay would also be provided to serve commuters from the East Bay. Provision of the GO Pass plus remote parking spaces in the East Bay would reduce VMT by 13.5 percent. This reduction in SUMC Project VMT, however, would not be sufficient to prevent project ROG, NO_x and PM_{10} emissions from exceeding the BAAQMD significance thresholds as shown in Table 3.5-7. In addition, the City shall consider the feasibility of Mitigation Measure PH-3.1, as identified and discussed in more detail in Section 3.13, Population and Housing. Nonetheless, impacts would be significant and unavoidable even with mitigation. (SU)

Table 3.5-7
SUMC Project Daily Operational Stationary and Mobile Source Emissions (with Mitigation)

	Emissions (Pounds per Day/Tons per Year)					
Emission Source	**ROG**	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Stationary (On-Site)	5.67/1.04	5.86/1.07	6.45/1.18	0.00/0.00	0.02/0.00	0.02/0.00
Central Energy Facility	----	110/20.08	37/6.75	----	----	----
Mobile	79.20/ 13.97	95.69/ 16.30	896.97/ 164.74	2.42/ 0.40	407.91/ 74.44	76.66/ 13.99
Total Emissions	**84.87/ 15.01**	**211.55/ 37.45**	**940.42/ 172.67**	**2.42/ 0.40**	**407.93/ 74.44**	**76.68/ 13.99**
BAAQMD Thresholds	**80/15**	**80/15**	**NT**	**NT**	**80/15**	**NT**
Significant Impact?	**Yes/Yes**	**Yes/Yes**	**NT**	**NT**	**Yes/Yes**	**NT**

Source: PBS&J, 2010. Based on year 2025 emission factors.
Notes:
NT = No threshold.
Estimates are results of modeling using the CARB URBEMIS 2007 version 9.2.4.

AQ-3. Localized Carbon Monoxide Impacts from Motor Vehicle Traffic. The SUMC Project would have less-than-significant localized air emissions resulting from additional traffic. (LTS)

Increases in traffic from the SUMC Project would contribute to localized CO emissions. The *BAAQMD CEQA Guidelines* recommends that CO concentrations should be estimated when vehicle emissions of CO would exceed 550 pounds or when project traffic would impact intersections operating at Level of Service (LOS) D or worse. CALINE4 dispersion modeling to determine local CO concentrations was performed for six intersections where resulting CO concentrations would be highest (see Table 3.5-8). The intersections were selected because they represent the instances where project traffic would produce the greatest change in LOS associated with the SUMC Project (and, therefore, the greatest increase in congestion, which would produce the greatest increase in CO emissions) and/or the highest total traffic volumes of all intersections in the Study Area. The resultant model predictions of CO levels fall far short of any CO standard violation. In fact, CO levels are predicted to decrease over time because of the expected continuing decline in CO emissions from California's motor vehicle fleet.

Table 3.5-8
Carbon Monoxide Concentrations at Selected Intersections

Intersection	One-Hour Average CO (ppm)[a] Existing	One-Hour Average CO (ppm)[a] Future Baseline (2025)	One-Hour Average CO (ppm)[a] Future w/ SUMC Project (2025)	Eight-Hour Average CO (ppm)[a] Existing	Eight-Hour Average CO (ppm)[a] Future Baseline (2025)	Eight-Hour Average CO (ppm)[a] Future w/ SUMC Project (2025)
El Camino Real/Ravenswood	6.8	5.9	5.9	3.2	2.6	2.6
El Camino Real/Palm Avenue/University Avenue	6.4	5.8	5.8	2.9	2.5	2.5
El Camino Real/Embarcadero	6.9	5.9	5.9	3.3	2.6	2.6
Junipero Serra/Page Mill	7.0	5.9	6.0	3.4	2.6	2.6
I-280 on- and off-ramps/Sand Hill Road	6.7	5.7	5.7	3.1	2.5	2.5
Santa Cruz Avenue/Sand Hill Road	6.6	5.8	5.9	3.1	2.5	2.5

There are no violations of ambient CO standards at receptor locations 25 feet from the intersection. Receptor locations further away would be exposed to even lower CO concentrations.

CO Background:	Ambient CO Standards:
1-Hour Average – 5.5 ppm	1-Hour Average – Federal: 35 ppm; State 20 ppm
8-Hour Average – 2.3 ppm	8-Hour Average – Federal and State: 9 ppm

Source: PBS&J, 2010.

Note:

a. Calculations reflect CO levels at 25 feet from roadway.

It should be noted that limiting the dispersion modeling to the six intersections in Table 3.5-8 is adequate for the following reasons:

- First, CO standards in the Bay Area have not been exceeded for almost 20 years, and the EPA has designated the entire Bay Area as "Attainment" with regard to the CO air quality standards.
- Second, CO levels, even at their highest as measured at Bay Area monitoring stations, are typically only a quarter to a third of the ambient standards; since these relatively low values are added to the CO modeling results as being representative of local background concentration, local emissions of CO by vehicles using the intersections would have to be very high to result in a local standard violations.
- Third, since the simplified CALINE4 model (developed by the BAAQMD) used to predict CO concentrations uses a standard intersection geometry (i.e., four straight roadways crossing at right angles), the local CO predictions at each intersection strongly correlate with only two traffic parameters: total volume through the intersection and the average travel speed of the vehicles.

Table 3.5-8 includes the selected intersections and the 1-hour and 8-hour concentrations for the different scenarios in 2025. The 1-hour CO concentration at 25 feet from the selected intersections during the PM peak hour under 2025 conditions with the SUMC Project would be up to 6.1 ppm and there would be a maximum 8-hour concentration of approximately 2.7 ppm. The maximum 1-hour CO concentration would be below the federal and State 1-hour standards of 35 ppm and 20 ppm, respectively. The maximum 8-hour concentration would be below the 9 ppm standard for both State and federal. Because the SUMC Project would not exceed CO standards, it is considered to have a less-than-significant impact on localized carbon monoxide emissions at intersections affected by project traffic. Therefore, localized CO impacts from the SUMC Project would be less than significant.

AQ-4. Toxic Air Contaminants. Simultaneous exposures to DPM and TACs from the construction and operational components of the SUMC Project would have a less-than-significant impact on air quality. (LTS)

The Health Risk Assessment for the SUMC Project (see Appendix F) was conducted to estimate the potential health effects associated with the incremental increase in DPM and other TAC emissions from construction and operational sources from the SUMC Project. The Health Risk Assessment evaluated TAC effects from the following sources:

- Exposure to emissions of DPM from construction equipment used for the SUMC Project;
- Incremental exposure to DPM emissions from additional onsite emergency generators at SUMC;
- Incremental exposure to DPM emissions from additional trucks traveling to/from the existing and proposed loading dock at SUMC; and
- Incremental exposure to TAC emission from additional helicopter travels to/from the existing and proposed helipad at SUMC.

On-site populations that could potentially be exposed to DPM emissions during construction activities and TAC emissions from post renovation operations related to the SUMC Project included occupants of the SUMC buildings (indoor workers) and individuals who may work outdoors in the vicinity of the buildings (outdoor workers). On-site indoor workers include individuals who typically work inside, such as employees of the hospitals, medical clinics and research facilities. On-site outdoor workers include individuals who typically work outside, such as parking lot attendants/valet, groundskeepers, security personnel, and loading dock personnel. The TAC exposures of off-site residents and off-site workers were also evaluated, as were off-site sensitive receptors including child care centers, preschools, elementary and middle schools, and retirement facilities/senior centers within a 1.5 mile area surrounding the SUMC Sites.

The results of the Health Risk Assessment indicate that the estimated excess lifetime cancer risks associated with potential simultaneous exposures to construction DPM and operational sources of TAC (i.e., the latter including emergency generators and delivery vehicles servicing loading docks) are below the BAAQMD significance threshold of 10 in one million and the estimated HIs are below one (1), as shown in Table 3.5-9. Thus, simultaneous exposures to

DPM and TACs from the construction and operational components of the SUMC Project would have a less-than-significant impact on air quality.

Table 3.5-9
Estimated Excess Lifetime Cancer Risk and Chronic Non-Cancer Hazard due to DPM and TAC Emissions from Project-Related Construction Activities and Onsite/Offsite Operational Sources

Receptor Location	Project Phase	Total Cancer Risk	Total Chronic Hazard Index (HI)
On-Site	Construction	9.8	0.29
	Operational	3.1	0.0034
Off-Site	Construction	9.6	9.6
	Operational	0.7	0.7

Source: Environ, 2010.

AQ-5. *Objectionable Odors. The SUMC Project would have a less-than-significant impact related to exposing the public to objectionable odors that would affect a substantial number of people. (*LTS*)*

The SUMC Project would include on-site stationary source emissions related to the periodic testing of emergency diesel generators. These emissions are not expected to have the potential for substantial odor impacts on local sensitive receptors. Under certain circumstances, emissions from older, badly maintained diesel engines can have the potential for odor impact, but such would not be the case with the SUMC Project emergency generators. They would be have advanced air emission control systems, would be well maintained, and would operated only briefly for periodic testing.

None of the activities associated with the SUMC Project would have the potential to expose nearby sensitive receptors (i.e., residential areas) to objectionable odors. According to *BAAQMD CEQA Guidelines*, objectionable odors are typically emitted by industrial and commercial operations such as wastewater treatment plants, sanitary landfills, petroleum refineries, chemical factories, and paint and coating operations. The SUMC Project consists of increased inpatient hospital and clinic/medical office uses. The SUMC Project would also replace existing research facilities with new research facilities of the same size. Such operations are not known to emit substantial objectionable odors that would impact sensitive receptors or sensitive land uses. As such, the SUMC Project would have a less-than-significant odor impact.

Cumulative Analysis

The geographic context for this discussion of cumulative impacts of ROG, NO_X, PM_{10} and $PM_{2.5}$ emissions on regional air quality is the SFAB; criteria pollutant emissions from sources in Santa Clara County and in the Bay Area are expected to be as shown in Table 3.5-10 in the year 2020, the most distant year available in the CARB's statewide emission inventory. *BAAQMD CEQA Guidelines* cumulative significance criteria are applied to the cumulative analysis of impacts to regional air quality, as discussed in AQ-6 below.

Table 3.5-10
San Francisco Air Basin and Santa Clara County
Criteria Pollutant Emissions Inventory and Projections,
2020 (Tons/Day - Annual Average)

	CO	ROG	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Bay Area						
2020 Estimated						
Total Emissions	1206.0	317.8	283.9	70.0	235.2	85.2
On-Road Motor Vehicle Emissions	460.1	57.0	88.2	1.0	9.9	6.6
Santa Clara County						
2020 Estimated						
Total Emissions	292.9	78.3	55.1	1.7	55.7	17.3
On-Road Motor Vehicle Emissions	114.5	14.4	19.2	0.3	2.4	1.6

Source: CARB, *Almanac Emission Projection Data*, http://www.arb.ca.gov/app/emsinv/emssumcat.php, accessed March 2010.

The effects of the SUMC Project and other future cumulative developments on traffic volumes on the streets in the vicinity of the SUMC Sites were included in the Transportation Impact Analysis. CALINE4 modeling results based on the Transportation Impact Analysis and shown in Table 3.5-8 for the "Future Baseline (2025)" and "Future with SUMC Project (2025)" scenarios include traffic volumes from this future cumulative development. In either scenario, CO concentrations would be below the applicable State and federal standards. Because CO standards would not be exceeded under cumulative future buildout conditions, cumulative CO impacts would be less than significant, and cumulative CO impacts are not considered below.

Since the SUMC Project would have no potential to expose nearby sensitive receptors (i.e., residential areas) to objectionable odors or to make a considerable contribution to the odor impacts from other sources (if any) in the vicinity of the SUMC Sites, the SUMC Project would not contribute to cumulative odor impact, and cumulative odor impacts are not considered below.

AQ-6. Cumulative Construction Emissions. Construction equipment NO_x emissions associated with the SUMC Project could contribute considerably to regional air quality problems. (S)

According to the 1999 *BAAQMD CEQA Guidelines*, any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact. As discussed in Impact AQ-1, construction equipment exhaust emissions of NOx could exceed the BAAQMD 80 lbs/day threshold[15] during the first year of SUMC Project construction; thus, this project-related significant impact would also be cumulatively significant.

The discussion of impacts considering the proposed *Draft BAAQMD CEQA Guidelines* is provided for informational purposes. With implementation of the proposed Draft BAAQMD CEQA Guidelines, quantitative significance criteria for construction equipment pollutant exhaust emissions would be lowered to 54 lbs/day for ROG, NO_x, and $PM_{2.5}$ and set at 82 lbs/day for PM_{10}. If these thresholds are adopted, the SUMC Project would exceed the proposed NO_x threshold during the first year of construction, a project-related significant impact that would also be cumulatively significant.

The *BAAQMD CEQA Guidelines'* approach to construction PM_{10} impacts from fugitive dust emissions during construction is to emphasize implementation of effective and comprehensive dust control measures, which would be applicable to all other construction projects in the Bay Area. This approach to construction PM_{10} control would remain the same with the implementation of the proposed *Draft BAAQMD CEQA* Guidelines. Thus, dust from the SUMC Project and all other regional construction activities would have a less-than–significant cumulative impact with implementation of dust emission control measures by the SUMC Project and by all other developments in the Bay Area.

MITIGATION MEASURES. Mitigation Measures AQ-1.1 and AQ-1.2 would reduce the SUMC Project's contribution to cumulative construction emissions, although the contribution to NO_x would remain cumulatively considerable. (SU)

AQ-7. Cumulative Operational Emissions. SUMC Project operation could contribute considerably to a degradation of regional air quality as defined by the BAAQMD. (S)

Future air quality improvement in the Bay Area could be hindered by SUMC Project emissions of ROG, NOx and PM_{10} exceeding the BAAQMD 80 lbs/day. According to the *BAAQMD CEQA Guidelines*, any project that would have an individually significant air quality impact would also be considered to have a cumulatively considerable contribution to a significant cumulative air quality impact. Further, even if a project does not have an individually significant air quality impact, if it requires a general plan amendment or zoning change that increases the development potential of the site, it could have a significant cumulative air quality impact.[16]

15 The *BAAQMD CEQA Guidelines (*1999) do not establish quantitative thresholds for construction emissions. In this case, and previously for judging the significance of the project-related construction emissions impact, the 80 lbs/day operational threshold was applied for judging the significance of the cumulative construction emissions impact.

16 BAAQMD, *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans,* Chapter 2.3, p. 19, December 1999.

The discussion of impacts considering the proposed *Draft BAAQMD CEQA Guidelines* is provided for informational purposes. With implementation of the proposed *Draft BAAQMD CEQA Guidelines*, quantitative significance criteria for operational emissions would be lowered to 54 lbs/day or 10 tons/year for ROG, NO_x, and $PM_{2.5}$ and set at 82 lbs/day or 15 tons/year for PM_{10}. If these thresholds are adopted, the SUMC Project would exceed the proposed operational thresholds for all pollutants, a project-related significant impact that would also be cumulatively significant.

The operational emissions from the SUMC Project would exceed the BAAQMD significance thresholds for ROG, NO_X and PM_{10}. Thus, the SUMC Project would also make a cumulatively considerable contribution to regional air pollutant emissions, a significant cumulative impact.

MITIGATION MEASURES. Mitigation Measure TR-2.3 in Section 3.4, Transportation, involves implementation of enhanced TDM measures. The enhanced TDM measures include provision of the Caltrain GO Pass to SUMC employees, or an equivalent TDM measure. If the GO Pass would be provided, then remote parking spaces at the Ardenwood Park and Ride Lot in the East Bay would also be provided to serve commuters from the East Bay. As additional mitigation, the City shall consider the feasibility of Mitigation Measure PH-3.1, as identified and discussed in more detail in Section 3.13, Population and Housing. These measures would reduce the contribution to criteria pollutants during operation of the SUMC Project. However, even with mitigation, emissions would still exceed the BAAQMD significance thresholds, and the contribution would remain considerable. (SU)

AQ-8. Cumulative Construction and Operational TAC Emissions. SUMC Project TAC emissions could contribute considerably to the health risk of sensitive receptors on and near the SUMC Project site and, thus, have a significant cumulative impact. (S)

Under the Community Air Risk Evaluation (CARE) program, the BAAQMD identified communities in the Bay Area subject to high TAC emissions, with sensitive populations that could be affected by them. During Phase I of CARE, the BAAQMD developed a preliminary Bay-Area-wide TAC emissions inventory (for the Year 2000) and compiled demographic and health-statistics data to identify sensitive populations. Five TACs (i.e., DPM, 1,3 butadiene, benzene, hexavalent chromium, and formaldehyde) were estimated to be responsible for about 97 percent of the Bay Area's cumulative cancer risk, with DPM alone accounting for about 80 percent of this risk. The major sources of DPM were identified as on-road and off-road heavy duty diesel trucks and construction equipment. BAAQMD risk modeling studies indicate that exposure to DPM results in a Bay Area average cancer risk of 500-700 in a million.[17] However, the Bay Area's highest DPM emissions were found to occur in the urban core areas of eastern San Francisco, western Alameda, central Santa Clara, and eastern San Mateo

[17] BAAQMD, *Toxic Air Contaminant Control Program, Annual Report 2003 Volume I*, August 2007.

Counties (the latter including Redwood City and East Palo Alto), where cancer risks were found to be substantially higher than the regional average.[18]

The Health Risk Assessment conducted for the SUMC Project found that DPM from project construction equipment would be the main TAC emitted. But it also evaluated operational DPM emissions from the facility's emergency generators and delivery trucks and determined health risks from both source categories. The health risks from both the SUMC Project's construction and operational sources were found to be less than the BAAQMD's TAC exposure significance threshold (i.e., 10 chances in a million of contracting cancer over a lifetime exposure). However, the SUMC Sites are adjacent to a BAAQMD-identified CARE "Priority Community," where the background DPM cancer risk is likely substantially greater than the Bay Area average 500 to 700 in a million. Although reduction in DPM from diesel engines has been given priority by federal, State, and local agencies, and regulations are in place to bring about substantial reduction of DPM from diesel engines over time, there is still no regional modeling study that predicts when remediation can be expected of the Bay Area's elevated DPM health risk identified in the CARE studies. Furthermore, the SUMC Project is the largest project compared to the list of cumulative projects expected to be developed in the City of Palo Alto (see Appendix B). Consequently, SUMC Project TAC emissions must be considered cumulatively considerable even though the health risk they pose to the local population is relatively small (i.e., 10 in a million) in comparison to the background TAC risk (i.e., greater than 700 in a million) that affects Palo Alto and environs.

MITIGATION MEASURE. Mitigation Measure AQ-1.2 (Implement Equipment Exhaust Emission Reduction Measures) has been identified primarily to reduce construction-phase criteria pollutant emissions, but it would also reduce DPM emissions. However, the emissions of criteria and DPM emissions from project construction sources were based on current best estimates of the type, number, and duration of use of the SUMC Project construction equipment. While some additional reductions of TACs would be expected with Mitigation Measure AQ-1.2, where their implementation is feasible, their potential additional reductions were not included in the SUMC Project's DPM estimates that were the basis of the Health Risk Assessment. However, it is not likely that the additional reductions in SUMC Project TAC emissions resulting from their implementation would reduce the SUMC Project health risk to the point where it would not be cumulatively considerable in the context of Palo Alto's high TAC background levels. Thus, SUMC Project TAC emissions would remain cumulatively significant even after the implementation of all feasible TAC reduction measures. (SU)

[18] BAAQMD, *Community Air Risk Evaluation Program, Phase I Findings and Policy Recommendations Related to Toxic Air Contaminants in the San Francisco Bay Area*, September 2006.

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3.6 CLIMATE CHANGE

Introduction

It is widely recognized that anthropogenic emissions of greenhouse gases[1] and aerosols are contributing to changes in the global climate, and that such changes are having and will have adverse effects on the environment, the economy, and public health. These are cumulative effects of past, present, and future actions worldwide. While worldwide contributions of greenhouse gases are expected to have widespread consequences, it is not possible to link particular changes to the environment of California to greenhouse gases emitted from a particular source or location. When considering a project's contribution to climate change impacts, it is possible to examine the quantity of greenhouse gases that would be emitted either directly or indirectly from a project. However, that quantity cannot be tied to a particular adverse effect on the environment associated with climate change.

During buildout and operation of the SUMC Project, greenhouse gases would be emitted as the result of construction activities and deliveries; new direct operational sources, such as operation of emergency generators, natural gas usage, medical nitrous oxide usage, and operation of fleet vehicles and helicopters; and indirect operational sources, such as production of electricity, steam and chilled water, transport of water, and decomposition of project-related wastes. Greenhouse gases would also be emitted by visitors and employees travelling to and from the SUMC Sites. This EIR discusses how the development proposed under the SUMC Project would contribute to emissions of greenhouse gases.

This EIR analysis was prepared based upon the CEQA Guideline Amendments for Greenhouse Gas Emissions,[2] as well as approaches prepared by a number of professional associations and agencies that have published suggested approaches and strategies for complying with CEQA's environmental disclosure requirements. Such organizations include the California Attorney General's Office (AGO), the California Air Resources Board (CARB), the California Air Pollution Control Officers Association (CAPCOA), the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), and the Association of Environmental Professionals (AEP).

The State of California, through Assembly Bill (AB) 32 and Executive Order S-3-05, has set statewide targets for the reduction of greenhouse gas emissions (see Applicable Plans and Regulations, below). CAPCOA's technical report, *CEQA and Climate Change*, states: "The goal of AB 32 and S-3-05 is the significant reduction of future greenhouse gas emissions in a state that is expected to rapidly grow in both population and economic output."[3] Accordingly, to achieve the state's goals, there will have to be a significant reduction in greenhouse gas emissions. While CEQA focuses on emissions associated with

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1 For the purposes of this analysis, the term "greenhouse gases" refers to carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, those gases regulated under California Assembly Bill 32 and the Kyoto Protocol of the United Nations Framework Convention on Climate Change.

2 OAL. The California Office of Administrative Law (OAL) codified the CEQA Guideline Amendments Addressing Greenhouse Gas Emissions on February 16, 2010, which become effective on March 18, 2010.

3 CAPCOA, 2008. CEQA and Climate Change, p. 32.

new development, other regulatory means would need to be implemented to address reductions in existing emissions.

For this EIR, emissions from sources such as construction, vehicles, energy consumption, water supply wastewater treatment, and solid waste generation are inventoried and discussed quantitatively and qualitatively. All emissions inventories are presented in metric tons (MT) unless otherwise indicated.

Sources used for this section include energy forecasts and consumption reports produced by the California Energy Commission (CEC); energy consumption data provided by the SUMC Project sponsors; data from the 2007 URBEMIS air quality modeling software; the Stanford University Medical Center Environmental Impact Report Transportation Impact Analysis (Appendix C); and information from the California Air Resources Board (CARB) and the California Climate Action Team (CAT).

Several climate change issues or comments were identified in response to the NOP or during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project. Commentors requested that the analysis use the most recent State standards and acknowledge that more comprehensive future greenhouse gas regulations are likely. Commentors also requested that the analysis explain how SUMC Project contributions would be measured, and requested that emissions be assessed in light of net increases.

Existing Conditions

Overview of Climate Change

Global climate change refers to changes in the normal[4] weather of the earth measured by alterations in wind patterns, storms, precipitation, and temperature relative to historical averages. Such changes vary considerably by geographic location. Over time, the earth's climate has undergone periodic ice ages and warming periods, as observed in fossil isotopes, ice core samples, and through other measurement techniques. Recent climate change studies use the historical record to predict future climate variations and the level of fluctuation that might be considered statistically normal given historical trends.

Temperature records from the Industrial Age (ranging from the late 18th century to the present) deviate from normal predictions in both rate and magnitude. Most modern climatologists predict an unprecedented warming period during the next century and beyond, a trend that is increasingly attributed to human-generated greenhouse gas emissions resulting from the industrial processes, transportation, solid waste generation, and land use patterns of the twentieth and twenty-first centuries. According to the United Nations Intergovernmental Panel on Climate Change (IPCC), greenhouse gas emissions associated with human activities have grown since pre-industrial times, increasing by 70

[4] "Normal" weather patterns include statistically normal variations within a specified range.

percent between 1970 and 2004.[5] Increased greenhouse gas emissions are largely the result of increasing fuel consumption, particularly the incineration of fossil fuels.

The IPCC modeled several possible emissions trajectories to determine what level of reductions would be needed worldwide to stabilize global temperatures and minimize climate change impacts. Regardless of the analytic methodology used, global average temperature and sea level were predicted to rise under all scenarios.[6] In other words, there is evidence that emissions reductions can reduce climate change effects but cannot reverse them entirely. On the other hand, emissions reductions can reduce the severity of impacts, resulting in lesser environmental impacts. For example, the IPCC predicted that the range of global mean temperature change from year 1990 to 2100, given different emissions reductions scenarios, could range from 1.1°C to 6.4°C.

The greenhouse gas emissions from an individual project, even a very large development project, would not individually generate sufficient greenhouse gas emissions to measurably influence global climate change.[7] However, climate change is an irreversible, significant cumulative impact on a global scale. Consideration of a project's impact to climate change, therefore, is essentially an analysis of a project's contribution to a cumulatively significant global impact through its emission of greenhouse gases.

Greenhouse Gases

Gases that trap heat in the atmosphere are called greenhouse gases because they transform the light of the sun into heat, similar to the glass walls of a greenhouse. Common greenhouse gases include water vapor, carbon dioxide, methane, nitrous oxides, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols. Without the natural heat trapping effect of greenhouse gas, the earth's surface would be about 34°C cooler.[8] However, it is believed that emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations. Global atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased markedly since the late 18th century as a result of human activities and now far exceed pre-industrial values.

5 Intergovernmental Panel on Climate Change, 2007. R.B. Alley et al. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Summary for Policymakers.

6 Intergovernmental Panel on Climate Change, 2007. R.B. Alley et al. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Summary for Policymakers.

7 Association of Environmental Professionals (AEP). 2007. Alternative Approaches to Analyzing Greenhouse Gas Emissions and Global Climate Change in CEQA Documents. http://www.califaep.org/userdocuments/File/ AEP_Global_Climate_Change_June_29_Final.pdf; and OPR, Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through CEQA Review, June 19, 2008, p. 6.

8 CARB, 2006. CARB Proposed Early Actions to Mitigate Climate Change in California.

Climate change results from radiative forcings and feedbacks. Radiative forcing is defined as the difference between the radiation energy entering the earth's atmosphere and the radiation energy leaving the atmosphere. Greenhouse gases allow solar radiation to penetrate the earth's atmosphere but slow the release of atmospheric heat. A feedback is an internal process that amplifies or dampens the climate's response to a specific forcing. For example, the heat trapped by the atmosphere may cause temperatures to rise or may alter wind and weather patterns. A gas or aerosol's global warming potential is defined as its ability to trap heat in the atmosphere; it is the "cumulative radiative forcing effects of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas."[9]

Individual greenhouse gases have varying global warming potentials and atmospheric lifetimes (see Table 3.6-1). The carbon dioxide equivalent is a consistent methodology for comparing greenhouse gas emissions since it normalizes various greenhouse gas emissions to a consistent metric. The reference gas for global warming potential is carbon dioxide; carbon dioxide has a global warming potential of one. By comparison, methane's global warming potential is 23, as methane has a greater global warming effect than carbon dioxide on a molecule to molecule basis.[10] One teragram ([Tg] equal to one million MT) of carbon dioxide equivalent (CO_2e) is the mass of a project's emissions of an individual greenhouse gas multiplied by the gas's global warming potential.

Table 3.6-1
Global Warming Potentials of Select Greenhouse Gases

Gas	Global Warming Potential (100 year time horizon)
Carbon Dioxide	1
Methane	23
Nitrous Oxide	296
HFC-23	12,000
HFC-134a	1,300
HFC-152a	120
PFC: Tetrafluoromethane (CF_4)	5,700
PFC: Hexafluoroethane (C_2F_6)	11,900
Sulfur Hexafluoride (SF_6)	22,000

Source: CCAR 2009. The GWP for the Third Annual Report was used in this analysis for consistency with the Stanford University Medical Center Greenhouse Gas emissions report.

Of all greenhouse gases in the atmosphere, water vapor is the most abundant, important, and variable. While not considered a pollutant, it contributes to the enhanced greenhouse effect because the warming influence of greenhouse gases increases the amount of water vapor in the atmosphere. In addition to its role as a natural greenhouse gas, water vapor in the atmosphere helps to maintain a climate necessary for life. The main source of water vapor is evaporation from the oceans (approximately 85 percent).

9 U.S. Environmental Protection Agency (EPA). 2006a. The U.S. Greenhouse Gas Emissions and Sinks: Fast Facts. Office of Atmospheric Programs.

10 CCAR, 2009. California Climate Action Registry General Reporting Protocol, Version 3.1, January 2009.

Other sources include evaporation from other water bodies, sublimation (change from solid to gas) from ice and snow, and transpiration from plant leaves. Water vapor is not considered further in this analysis because it is generally accepted that anthropogenic activities have not directly increased the amount of water vapor in the atmosphere.[11]

Carbon dioxide (CO_2) is an odorless, colorless gas, which has both natural and anthropogenic sources. Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic out-gassing. Anthropogenic sources of carbon dioxide are from burning coal, oil, natural gas, and wood. Concentrations of carbon dioxide were 379 parts per million (ppm) in 2005, which equates to an increase of 1.4 ppm per year since 1960.[12] CO_2 is the most common greenhouse gas generated by California activities, constituting approximately 84 percent of all greenhouse gas emissions.[13] CO_2 emissions attributed to California activities are mainly associated with in-state fossil fuel combustion and fossil fuel combustion in out-of-state power plants supplying electricity to California. Other activities that produce CO_2 emissions include mineral production, waste combustion, and deforestation.

Methane (CH_4) is a flammable gas and is the main component of natural gas. When one molecule of methane is burned in the presence of oxygen, one molecule of carbon dioxide and two molecules of water are released. A natural source of methane is the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain methane, which is extracted for fuel. Other sources include the exhaust from the combustion of fossil fuels, landfills, fermentation of manure, and cattle.

Nitrous oxide (N_2O), also known as laughing gas, is produced naturally by microbial processes in soil and water. Anthropogenic sources of nitrous oxide include agricultural sources, industrial processing, fossil fuel-fired power plants, and vehicle emissions. Nitrous oxide also is used as an aerosol spray propellant and has medical applications.

Other gases that contribute to the greenhouse effect include ozone,[14] chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and aerosols. This analysis focuses on the major sources of greenhouse gases, including carbon dioxide, nitrous oxide, and methane because these are the gases currently regulated in the State of California.

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[11] U.S. Environmental Protection Agency (EPA), September 8, 2009; http://www.epa.gov/ climatechange/ glossary.html#W, accessed January 6, 2010.

[12] IPCC, 2007. R.B. Alley et al. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Summary for Policymakers.

[13] CEC, 2006. Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004.

[14] Ozone is a greenhouse gas; however, unlike other greenhouse gases, ozone in the troposphere is relatively short-lived. It is difficult to make an accurate determination of the contribution of ozone precursors (nitrogen oxides and volatile organic compounds) to global climate change. California Environmental Protection Agency, 2004. Technical Support Document for Staff Proposal Regarding Reduction of Greenhouse Gas Emissions from Motor Vehicles Climate Change Overview.

Greenhouse Gas Emissions Inventories

Worldwide, United States, and California Inventories. A greenhouse gas inventory is an accounting of the amount of greenhouse gases emitted to or removed from the atmosphere over a specified period of time attributed to activities by a particular entity (e.g., annual emissions and reductions attributed to the State of California). A greenhouse gas inventory also provides information on the activities that cause emissions and removals, as well as the methods used to make the calculations. In 2004, total worldwide greenhouse gas emissions were estimated to be 49,000 Tg CO_2e.[15] In 2006, greenhouse gas emissions in the U.S. were 7,054 Tg CO_2e, a 14.7 percent increase over 1990 emissions.[16]

California is the second largest contributor of greenhouse gas emissions in the U.S. and the sixteenth largest in the world.[17] In 2004, California produced 427 Tg CO_2e,[18] which is approximately six percent of 2004 U.S. emissions and 0.9 percent of global emissions. In California, the most common greenhouse gas is CO_2 from fossil fuel combustion, which constitutes approximately 81 percent of all greenhouse gas emissions.[19] The remainder of greenhouse gases only makes up a small percentage of the total: nitrous oxide constitutes 6.8 percent, methane 5.7 percent, high GWP gases 2.9 percent, and non-fossil fuel CO_2 emissions constitute 2.8 percent.[20] CO_2 emissions in California are mainly associated with fossil fuel consumption in the transportation sector (40.7 percent) with Electricity production (from both in-state and out-of-state sources) as the second-largest source (22.2 percent).[21] Industrial, agriculture and forestry, commercial, and residential activities comprise the balance of California's greenhouse gas emissions.

As part of the California Global Warming Solutions Act of 2006 (AB 32), discussed below, CARB is required to establish a statewide greenhouse gas emissions limit for 2020 equivalent to 1990 emissions. In addition, Executive Order S-3-05 sets the following statewide emissions targets: a reduction of greenhouse gas emissions to 2000 levels by 2010, a reduction of greenhouse gas emissions to 1990 levels by 2020, and a reduction of greenhouse gas emissions to 80 percent below 1990 levels by 2050. CARB estimates that California's annual emissions were equivalent to 427 Tg CO_2e in 1990 and 452 Tg CO_2e in 2000.[22] Table 3.6-2 shows quantified California statewide emissions targets (AB 32 and Executive Order S-3-05 targets) based on the CEC's 2006 Inventory of California Greenhouse Gas Emissions and Sinks.

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15 Intergovernmental Panel on Climate Change, 2007. R.B. Alley et al. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Summary for Policymakers.
16 EPA, 2008. The U.S. Greenhouse Gas Emissions and Sinks: Fast Facts. Office of Atmospheric Programs.
17 CEC, 2006. Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004.
18 CEC, 2006. Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004.
19 CEC, 2006. Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004.
20 CEC, 2006. Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004.
21 CEC, 2006. Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004.
22 CARB, 2007. Greenhouse Gas Emissions Inventory Database [1990 - 2004]. Accessed online August 5, 2008 at: http://www.arb.ca.gov/app/ghg/ghg_sector_data.php

Table 3.6-2
California Greenhouse Gas Reductions Targets

Year[a]	Estimated California Population	Reduction Goal	Greenhouse Gas Target (Tg CO_2e)
1990	29,828,000	N/A	427.0
2000	34,105,437	N/A	452.3
2010	39,135,676	GHG emissions at or below 2000 levels[b]	452.3
2020	44,135,923	GHG emissions at or below 1990 levels	427.0
2050	59,507,876	GHG emissions 80% below 1990 levels	341.6[c]

Source: Population data are from California Department of Finance, 2007; greenhouse gas targets are derived from CARB, 2007. Greenhouse Gas Emissions Inventory Summary [1990 - 2004].

Notes:

a. Target years specified in Executive Order S-3-05 and/or AB 32. 1990 and 2000 data are provided as a baseline.
b. Based on 2004 estimate.
c. Calculated by multiplying 427.0 x 80 percent.

Palo Alto Inventory. According to the Palo Alto Climate Protection Plan (discussed below) the City's total annual emissions are estimated at 814,254 MT CO_2e per year,[23] which constitutes approximately 0.16 percent of the 2004 emissions estimated in the statewide greenhouse gas emissions inventory. The three primary sources of emissions from Palo Alto are as follows:[24]

- *Commute Emissions*, plus other non-commute driving and air travel, accounts for 333,400 MT of CO_2e, or 40 percent of citywide emissions.
- *Natural Gas and Electricity* use accounts for 155,016 MT of CO_2e, or 19 percent of citywide emissions.
- *Emissions from Solid Waste* account for 100,304 MT of CO_2e, or 14 percent of citywide emissions.[25]

Although the Climate Protection Plan (Plan) reports that per capita Palo Alto emissions (not including municipal operations-generated emissions) are 14 MT annually, 26 percent above the statewide average, the Plan recognizes that methodologies for inventorying municipal emissions are not standardized and that emissions may be considered in the Climate Protection Plan that are not considered in other inventory approaches.[26] The Plan recognizes that: "[the inventory] includes sources of emissions… generated outside Palo Alto and even outside the United States as part of 'upstream' emissions from the manufacture of products used but not produced in Palo Alto."[27]

23 City of Palo Alto. Palo Alto Climate Protection Plan, 2007.
24 City of Palo Alto. Palo Alto Climate Protection Plan, 2007.
25 Fugitive methane emissions associated with annual solid waste interment account for only 24,823 MT of this total. The remainder is from historical solid waste interment and combustion of landfill gases.
26 City of Palo Alto. Palo Alto Climate Protection Plan, 2007, p. 13.
27 City of Palo Alto. Palo Alto Climate Protection Plan, 2007, p. 15.

SUMC Inventory. The SUMC Sites support hospital, clinic, and medical research uses. Greenhouse gas emissions are currently generated by sources at the SUMC Sites. An inventory of the greenhouse gas emissions directly and indirectly generated by the hospitals was prepared by Mazzetti and Associates.[28] Stanford University prepared the inventory for SoM facilities. Both inventories were reviewed for accuracy in preparation of this EIR. PBSJ prepared the inventory of greenhouse gas emissions associated with vehicle trips to and from the SUMC Sites and added an evaluation of electricity consumption, solid waste generation, water consumption, and waste water generation.

To estimate total existing emissions, the emissions of the individual gases were estimated, then converted to their CO_2 equivalents (CO_2e) using the individually determined global warming potential of each gas. Thus, total greenhouse gas emissions equals the sum of the CO_2e emissions of CO_2, CH_4 and N_2O. All emissions factors are from California Climate Action Registry (CCAR), unless otherwise noted.

Direct, existing emissions sources at the SUMC Sites include the following:

- *Natural Gas.*[29] Stationary natural gas combustion refers to fuel that is burned on site for space heating and food service applications. Existing natural gas usage is based upon records for the calendar year of 2007 from the City of Palo Alto Utilities Department (CPAU).
- *Stationary Diesel.* Stationary diesel combustion refers to diesel consumed in the operation of the facilities' emergency generators. Existing diesel combustion is based upon fuel purchase records for 2007.
- *Fleet Vehicles.* Fleet vehicle fuel purchase records were obtained for all SUMC accounts. Only those emissions generated by vehicles owned and operated by SUMC affiliates are included in this category.
- *Medical Nitrous Oxide.* Nitrous oxide (N_2O) is used for many medical procedures in the hospitals and clinics. N_2O is not metabolized by the human body, and therefore, is completely exhausted to the atmosphere. Existing N_2O emissions at the SUMC Sites are based upon the amount of N_2O purchased by SHC and LPCH in 2007. It is assumed that 100 percent of the N_2O used by the hospitals was released into the atmosphere.
- *Helicopter Fuel.* One of the helicopters used to transport patients to and from the SUMC is owned and operated by the hospitals. Existing helicopter fuel consumption is based upon fuel purchase records for 2007.

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28 Mazzetti and Associates, Consultants and Engineers, 2008. Stanford University Medical Center 2007 Greenhouse Gas Inventory. This document is available upon request at the Planning and Community Environment Department, the contact information for which is provided in Section 1, Introduction, of this EIR.

29 Electricity and natural gas emissions calculations are based on average annual demand rather than peak demand. Peak demand represents the maximum electricity generation, and is used to plan the load capacity of new infrastructure. Average capacity is used to estimate total consumption over a long-term period. Emissions estimates are provided on an annual basis.

Indirect emissions sources associated with existing facility operations include the following:

- *Electricity Generation*. SUMC facilities use electricity for lighting, machinery and other uses, which contribute to indirect greenhouse gas emissions. The generation of electricity through the combustion of fossil fuels typically yields CO_2 and, to a much smaller extent, CH_4 and N_2O. Existing electricity usage is based upon records for the calendar year of 2007 from CPAU.
- *Steam and Chilled Water*. The SHC, LPCH, and SoM buildings receive steam and chilled water produced at Stanford's Central Energy Facility (CEF). A greenhouse gas emissions inventory for the CEF has been prepared by Stanford University. The portion of the emissions attributable to the SHC, LPCH, and SoM was estimated by applying the ratio of the energy consumed by these entities to the total energy consumed by all entities served by the CEF to the CEF's total greenhouse gas emissions.
- *Vehicular Emissions, Non-Fleet Vehicles*. The inventory includes quantification of the emissions associated with employee, patient, and visitor vehicles based on an estimate of the Vehicle Miles Traveled (VMT) to and from the SUMC Sites. The VMT was calculated by AECOM Transportation[30] based on the commuting patterns of existing employees and patients (see Appendix E). The VMT calculations assume that 60 percent of the daily trips are made by patients and 40 percent made by employees. Using employee and patient origin data (zip codes) provided in the project application, distances from these origins to the SUMC Sites were estimated. An average trip length was applied to the trip generation factors in the Transportation Impact Analysis. CO_2 emissions associated with existing VMT were calculated using CARB's URBEMIS 2007 model, while N_2O and CH_4 were calculated using CCAR fuel emissions factors**.**

The following sources are more indirect than the sources listed above, and are not included in the methodology specified by CCAR for producing an inventory of greenhouse gas emissions associated with individual businesses:

- *Water Consumption*. Greenhouse gas emissions are generated by the infrastructure used to distribute and treat the domestic water supply. Water consumption, including consumption at the SUMC Sites, generates emissions by the amount of energy needed to treat and transport the water. Water is provided to the City of Palo Alto and the SUMC Sites by the San Francisco Public Utilities Commission (SFPUC). The SFPUC's Hetch Hetchy water system operates hydroelectric generation facilities. This electrical generation powers the treatment and transportation of the potable water system as well as a portion of the City of San Francisco. The generation of this renewable energy powers the pumps and treatment of the potable water resulting in zero emissions of greenhouse gases.
- *Wastewater Treatment*. Greenhouse gas emissions are generated by the infrastructure used to collect and treat wastewater. By generating wastewater, development at the SUMC Sites

[30] Dennis Struecker, P.E., and Nichole Seow, AECOM Transportation, Memorandum to Trixie Martelino, Stanford EIR - Revised VMT Calculation for SUMC, February 11, 2010.

contributes to these emissions. Waste water generation emits greenhouse gases through the amount of energy needed to treat and transport the waste water. Project emissions from waste water are estimated based on the average water discharge to the sewer and the electrical generation factors for the treatment and transport of waste water provided by the California Energy Commission (CEC).

- *Solid Waste.* According to the EPA's emissions reporting protocol, emissions of CO_2 from solid waste interment and wastewater treatment are considered to be biogenic greenhouse gases and part of the carbon cycle, and as such, are typically not included in greenhouse gas emission inventories.[31] Nevertheless, fugitive CH_4 emissions associated with solid waste management have been estimated for use in this EIR. Currently the SUMC Sites generate approximately 3,700 tons of non-recyclable solid waste each year, approximately 5 percent of the solid waste that is landfilled citywide. It is assumed, therefore, that the SUMC Sites account for approximately 5 percent of the 26,774 MT CO_2e of citywide fugitive solid waste emissions estimated for 2006 from the Climate Protection Plan.

It is believed that the above sources represent the vast majority of the greenhouse gas emissions associated with the SUMC Sites. The SUMC Sites may emit a small amount of HFC emissions from leakage and service of refrigeration and air conditioning equipment and from disposal at the end of the life of the equipment;[32] however, the contributions of these emissions to the total inventory are likely quite small. PFCs and sulfur hexafluoride are typically used in industrial applications that are not conducted at the SUMC Sites. Ozone has characteristics of a greenhouse gas; however, unlike regulated greenhouse gases, ozone in the troposphere is relatively short-lived and therefore is localized rather than global in nature. According to CARB, it is difficult to make an accurate determination of the contribution of ozone precursors (NO_X and ROGs) to global warming.[33] Facilities at the SUMC Sites do not emit CFCs, another gas with greenhouse gas characteristics, because CFCs are banned under federal regulations. Therefore, the inventory presented in Table 3.6-3, represents a good-faith estimate of all emissions directly and indirectly associated with current SHC, LPCH, and SoM operations. The total greenhouse gas emissions currently generated by the SHC, LPCH, and SoM on an annual basis is 164,964 metric tons CO_2e, 21 percent of citywide emissions.

The City's methodology in the Climate Protection Plan for the City of Palo Alto is based on the California Climate Action Registry's Local Government Protocols. It is important to note that this inventory in Table 3.6-3 cannot be exactly compared to the City's inventory of emissions because of the difference in methodology that the City has used in its Climate Protection Plan. The City's inventory of emissions was calculated for year 2005 in the Climate Protection Plan for the City of Palo Alto. As such, the inventory is approximately five years old and would not reflect any changes in emission sources within the City that may have occurred over the last five years. The methodology used in the Climate Protection Plan attributes half of a round trip for employees and visitors traveling

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31 EPA, 1995. AP 42, Fifth Edition: Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources.

32 Godwin, David S., Marian Martin Van Pelt and Katrin Peterson, no date. Modeling Emissions of High Global Warming Potential Gases. Environmental Protection Agency.

33 California Air Resources Board (CARB), 2004. Fact Sheet, Climate Change Emission Control Regulations.

to Palo Alto, and attributes a full round trip for travel within Palo Alto. This adjustment would decrease emissions associated with SUMC non-fleet vehicles by approximately 14 percent. The City's inventory also does not include emissions associated with medical nitrous oxide, private fleet vehicles, helicopter fuels, or emissions from generation of steam and chilled water at Stanford's Central Energy Facility. The City's inventory includes aircraft fuel from the municipal airport, emissions from discarded recyclables in the waste stream and high warming potential gases such as refrigerant. Despite those differences, the SUMC inventory is approximately comparable to the results to the citywide inventory. Both the citywide inventory and the SUMC Project inventories show that transportation and energy related emissions are the largest emission contributors and accordingly both inventories emphasize the need to reduce transportation and energy related emissions.

Table 3.6-3
Existing Annual Greenhouse Gas Emissions, SHC, LPCH, and SoM

	Units Consumed			**Emissions (MT CO_2e)**		
Source of Emissions	**SHC and LPCH**	**SoM**	**Total**	**SHC and LPCH**	**SoM**	**Total**
Natural Gas (therms)	331,429	0	331,429	1,759	0	1,759
Diesel Generators (gallons)	13,707	0	13,707	139	0	139
Medical Nitrous Oxide (cubic feet)	8,815	0	8,815	137	0	137
Fleet Vehicle Fuels (gallons)	41,864	0	41,864	356	0	356
Helicopter Fuel (gallons)	75,297	0	75,297	721	0	721
Electricity (MWh) [a]	63,365	12,223	75,588	14,979	2,889	17,869
Steam and Chilled Water (MBtu)	N/A	131,765	131,765	28,050	11,991	40,041
Non-fleet Vehicular Emissions (VMT)[b]	N/A	N/A	600,246	N/A	N/A	102,619
Solid Waste (tons)[c]	N/A	N/A	3,700	N/A	N/A	1,324
Total						**164,964**[d]

Source: Mazzetti and Associates Consultants and Engineers, 2008, Stanford University Medical Center 2007 Greenhouse Gas Inventory. Additional data provided by PBS&J, 2010.

Notes:

N/A = No data available.

a. The Mazzetti and Associates inventory (sourced for this table) used an electricity emission factor of 263.62 lbs CO_2/MWh, cited to CPAU. However, the City has indicated that this emissions factor does not apply to the development on the SUMC Sites and requested that the inventory be revised using CO_2 emissions factor of 520 lbs CO_2/MWh based on the City's energy purchasing records, and CCAR's standard emissions factors for N_2O and CH_4 (0.0037 lbs N_2O/MWh and 0.0067 lbs CH_4/MWh). The electricity emissions in this table represent the use of the revised emission factors. The emissions for electricity include the emissions from actual electrical consumption as well as the consumption of electricity to treat and transport wastewater. Therefore, the emissions numbers are slightly higher than the emissions from actual electrical consumption alone.

b. Calculated using VMT assumptions reported by AECOM Transportation, (Appendix E). Emissions were modeled using the VMT assumptions from AECOM in the URBEMIS 2007 software.

c. SUMC solid waste emissions were determined based on total citywide emissions. Existing SUMC solid waste generation is 5 percent of citywide waste generation. Therefore, emissions attributed to SUMC generation was determined to be 5 percent of total citywide waste emissions.

d. Numbers may not add exactly due to rounding.

Predicted Effects of Climate Change

Climate change could have a number of adverse effects. Although these effects would have global consequences, in most cases they would not disproportionately affect any one site or activity. In other words, many of the effects of climate change are not site-specific. Emission of greenhouse gases would contribute to the changes in the global climate, which would in turn, have a number of physical and environmental effects. A number of general effects, some of which may not occur at the SUMC Sites, are discussed below.

Sea Level Rise and Flooding. The California Climate Change Center predicts that sea level in California would rise between 10.9 to 71.6 centimeters (cm) (0.36 to 2.3 feet) above existing mean sea level (MSL) by 2099 as a result of climate change.[34] Measurements taken in the City of Alameda indicate that the current rate of sea level rise is about 0.29 feet per century.[35] Therefore, projected climate change effects on sea level would increase the existing rate of sea level rise by 0.07 to 1.94 feet per century. When combined with astronomical tides, even a 1-foot increase in MSL would result in the 100-year event high tide peak occurring at the 10-year event frequency.[36] In other words, the frequency of a current 100-year high tide (about 9.5 feet above current MSL) would occur 10 times more often when sea levels increase by 1 foot above current MSL.

If sea level rise continues at existing rates, the SUMC Sites would not be inundated during the study period for this EIR because the SUMC Sites are more than 60 feet above MSL. Furthermore, the San Francisco Bay Conservation and Development Commission (BCDC) has prepared maps to indentify the areas that might be inundated if sea levels were to increase by 1 meter (3.28 feet), which is more that the amount predicted by the California Climate Change Center. These maps show that the SUMC Sites would not be inundated with even a 3.28-foot increase in MSL.[37] The maps do indicate that key access routes to the hospital, including US 101 and parts of Oregon Expressway and Embarcadero Road,

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34 Cayan, D., P. Bromirski, K. Hayhoe, M. Tyree, M. Dettinger, and R. Flick. 2006. Projecting Future Sea Level: Table 3 Projected global sea level rise (SLR) (cm) for the SRES A1fi, A2, and B1 greenhouse gas emission scenarios. SLR for A2 and B1 scenarios is estimated by combining output recent global climate change model simulations with MAGICC projections for the ice melt component. SLR estimates for A1fi estimated from MAGICC based on A2 temperature changes scaled according to those in A1fi. A Report From the California Climate Change Center CEC-500-2005-2002-SF. p. 19

35 Floyd, M., M. Anderson, M. Roos, R. Peterson, M. Perrone, and D. Todd. 2006. Chapter 2: Potential Impacts of Climate Change on California's Water Resources, Table 2-6 Relative Sea Level Trends for Eight Tide Gauges Along the Coast of California with 50 Years or More of Record. p. 2-43. In Medelin, J., J. Harou, M. Olivares, J. Lund, R. Howitt, S. Tanaka, M. Jenkins, K. Madani, and T. Zhu (Eds), Climate Warming and Water Supply Management In California: White Paper. A Report From Climate Change Center CEC-500-2005-195-SF.

36 Floyd, M., M. Anderson, M. Roos, R. Peterson, M. Perrone, and D. Todd. 2006. Chapter 2: Potential Impacts of Climate Change on California's Water Resources, Figure 2.32 Impact of One Foot Sea Level rise on the Relative Effect of Astronomical tides in the Delta. p. 2-53. In Medelin, J., J. Harou, M. Olivares, J. Lund, R. Howitt, S. Tanaka, M. Jenkins, K. Madani, and T. Zhu (Eds), Climate Warming and Water Supply Management In California: White Paper. A Report From Climate Change Center CEC-500-2005-195-SF.

37 San Francisco Bay Conservation and Development Commission. 2006. San Francisco Bay Scenarios for Sea Level Rise Westshore South Bay. Available at: http://www.bcdc.ca.gov/index.php?cat=56

would be inundated in some circumstances. However, rising sea levels would not be expected to directly affect the SUMC Sites.

In the future, precipitation events are predicted to vary in terms of timing, intensity, and volume according to many climate change models.[38] Extreme storm events may occur with greater frequency.[39] The effect on peak runoff is not known because most climate change models have not used a temporal (or spatial) scale necessary to identify effects on peak flows, and existing precipitation/runoff models for assessing the effects of climate change do not yet adequately predict rainfall/runoff scenarios.[40] Changes in rainfall and runoff could affect flows in surface water bodies, causing increased flooding and runoff to the storm drain system. However, the effect that future changes to the hydrologic cycle may have on the SUMC Sites and City is speculative and is not addressed further in this document.

Water Supply. California Health and Safety Code Section 38501(a) recognizes that "[climate change] poses a serious threat to the economic well-being, public health, natural resources, and the environment of California," and notes, "the potential adverse impacts of [climate change] include…reduction in the quality and supply of water to the state from the Sierra snowpack." As most of the State, including the San Francisco Peninsula, depends on surface water supplies originating in the Sierra Nevada this water supply reduction is a concern. SFPUC recognizes that climate change may cause increased uncertainty the Sierra snowpack, and a higher chance of water shortages in the Bay Area. SFPUC's initial steps to address climate change include "engaging national climate change experts to study the potential effects of reduced snowpack, rising seas and hotter temperatures on the SFPUC's water supplies, wastewater collection and energy generation."[41]

Most of the scientific models addressing climate change show that the primary effect on California's climate would be a reduced snow pack and a shift in stream-flow seasonality. A higher percentage of the winter precipitation in the mountains would likely fall as rain rather than as snow in some locations, reducing the overall snowpack. Further, as temperatures rise, snowmelt is expected to occur earlier in the year. As a result, peak runoff would likely come a month or so earlier. The end result of this would be that the State may not have sufficient surface storage to capture the resulting early runoff, and so, absent construction of additional water storage projects, a portion of the current supplies would be lost to the oceans, rather than be available for use in the State's water delivery systems.

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38 EPA, 2008. Climate Change Science: Precipitation and Storm Changes. Accessed January 16, 2009 at: http://www.epa.gov/climatechange/science/recentpsc.html

39 EPA, 2008. Climate Change Science: Precipitation and Storm Changes. Accessed January 16, 2009 at: http://www.epa.gov/climatechange/science/recentpsc.html

40 Anderson. M. 2006. Chapter 6: Climate Change Impacts on Flood Management p. 6-22 and 6-27. In Medelin, J., J. Harou, M. Olivares, J. Lund, R. Howitt, S. Tanaka, M. Jenkins, K. Madani, and T. Zhu (Eds), Climate Warming and Water Supply Management In California: White Paper. A Report From Climate Change Center CEC-500-2005-195-SF

41 San Francisco Public Utilities Commission website. Accessed July 2007. http://sfwater.org/detail.cfm/MC_ID /18/MSC_ ID/114/MTO_ID/342/C_ID/3124/Keyword/climate%20change.

The SFPUC investigations predict a decrease in snowpack volume from the current 87 percent of historic averages to 83 percent in 2025 and 76 percent in 2050.[42] Changing climatic conditions could also shift the timing of snowmelt, so that peak runoff would occur earlier in the spring. This shift could affect the availability of the seasonal water supply, particularly during the hot summer months. However, the SFPUC states that the effect of climate change in 2025 would likely be within range of current annual variation (with a slight shift in runoff timing).[43] Variation in the annual water supply is discussed in further detail in the Water Supply Assessment prepared for the SUMC Project (see Appendix M).

Water Quality.[44] Climate change could have adverse effects on water quality, which would in turn affect the beneficial uses (habitat, water supply, etc.) of surface water bodies and groundwater. The changes in precipitation discussed above could result in increased sedimentation, higher concentration of pollutants, higher dissolved oxygen levels, increased temperatures, and an increase in the amount of runoff constituents reaching surface water bodies. Sea level rise, discussed above, could result in the encroachment of saline water into freshwater bodies.

Ecosystems and Biodiversity.[45] Climate change is expected to have effects on diverse types of ecosystems, from alpine to deep sea habitat. As temperatures and precipitation change, seasonal shifts in vegetation will occur; this could affect the distribution of associated flora and fauna species. As the range of species shifts, habitat fragmentation could occur, with acute impacts on the distribution of certain sensitive species. The IPCC states that "20 percent to 30 percent of species assessed may be at risk of extinction from climate change impacts within this century if global mean temperatures exceed 2 to 3°C (3.6 to 5.4°F) relative to pre-industrial levels."[46] Shifts in existing biomes could also make ecosystems vulnerable to invasive species encroachment. Wildfires, which are an important control mechanism in many ecosystems, may become more severe and more frequent, making it difficult for native plant species to repeatedly re-germinate. In general terms, climate change is expected to put a number of stressors on ecosystems, with potentially catastrophic effects on biodiversity.

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42 San Francisco Public Utilities Commission, 2008. Modeling, Coalition Building, and Adaptation Response: San Francisco's Approach to Climate Change. Presentation made by Michael Carlin, Assistant General Manager, Water Enterprise, April 10, 2008.

43 San Francisco Public Utilities Commission, 2008. Modeling, Coalition Building, and Adaptation Response: San Francisco's Approach to Climate Change. Presentation made by Michael Carlin, Assistant General Manager, Water Enterprise, April 10, 2008.

44 IPCC, 2007: Climate Change 2007: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change [Parry, Martin L., Canziani, Osvaldo F., Palutikof, Jean P., van der Linden, Paul J., and Hanson, Clair E. (eds.)]. Cambridge University Press, Cambridge, United Kingdom, 1000 pp.

45 EPA, 2008. Climate Change – Ecosystems and Biodiversity. Accessed online January 3, 2009 at: http://www.epa.gov/climatechange/effects/eco.html

46 IPCC, 2007: Climate Change 2007: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change [Parry, Martin L., Canziani, Osvaldo F., Palutikof, Jean P., van der Linden, Paul J., and Hanson, Clair E. (eds.)]. Cambridge University Press, Cambridge, United Kingdom, 1000 pp.

Human Health Impacts.[47] Climate change may increase the risk of vector-borne infectious diseases, particularly those found in tropical areas and spread by insects—malaria, dengue fever, yellow fever, and encephalitis. Cholera, which is associated with algal blooms, could also increase. While these health impacts would largely affect tropical areas in other parts of the world, effects would also be felt in California. Warming of the atmosphere would be expected to increase smog and particulate pollution, which could adversely affect individuals with heart and respiratory problems, such as asthma. Extreme heat events would also be expected to occur with more frequency, and could adversely affect the elderly, children, and the homeless. Finally, the water supply impacts and seasonal temperature variations expected as a result of climate change could affect the viability of existing agricultural operations, making the food supply more vulnerable.

Applicable Plans and Regulations

Executive Order S-3-05

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05, setting statewide targets for the reduction of California's greenhouse gas emissions. The Executive Order S-3-05 states that greenhouse gases should be reduced to:

- 2000 levels by the year 2010,
- 1990 levels by the year 2020, and
- 80 percent below 1990 levels by the year 2050

The text of Executive Order S-3-05 does not explain how the targets should be applied to individual development projects.

Executive Order S-3-05 also established the Climate Action Team (CAT) for State agencies. After numerous public meetings and review of thousands of submitted comments, the CAT released its first report, *Climate Action Team Report to the Governor and the Legislature*, in March 2006, identifying key carbon reduction recommendations.

In April 2007, the CAT released a second report, *Proposed Early Actions to Mitigate Climate Change in California*, which identifies numerous strategies for initiation of other climate action regulations and efforts prior to the 2012 deadline established by Assembly Bill 32 (discussed below). State agencies are moving ahead on many of these Early Actions.

In October 2007, the CAT released the report, *Updated Macroeconomic Analysis of Climate Strategies*. This report updates the strategies presented in the 2006 CAT report.

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[47] EPA, 2008. Climate Change – Health and Environmental Effects. Accessed online January 3, 2009 at: http://www.epa.gov/climatechange/effects/health.html#climate

Assembly Bill 32

Shortly after the issuance of Executive Order S-3-05, the California State Legislature adopted Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 recognizes that California is the source of substantial amounts of greenhouse gas emissions. In the Findings and Declarations for AB 32, the Legislature found that:

> The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to the marine ecosystems and that natural environment, and an increase in the incidences of infectious diseases, asthma and other health-related problems.

To avert these consequences, AB 32 requires CARB, the State agency charged with regulating statewide air quality, to create a plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases". AB 32 requires CARB to design and implement emissions limits, regulations, and other measures, such that statewide greenhouse gas emissions would be reduced to 1990 levels by 2020, the same 2020 threshold indicated in Executive Order S-3-05. AB 32 directs CARB to develop early actions to reduce greenhouse gas emissions while also preparing a Scoping Plan to identify how best to reach the 2020 limit. The measures and regulations to meet the 2020 target are to be in effect by 2012.

California Air Resources Board Climate Change Scoping Plan. CARB's *Climate Change Scoping Plan*, adopted on December 11, 2008, reports that CARB has met the first milestones set by AB 32. As discussed above, CARB was required to prepare a historical emissions inventory and set emissions targets for 2020. On December 6, 2007, CARB released the calculated 1990 GHG emissions of 427 million MT CO_2e. In 2004, the emissions were estimated at 480 million MT CO_2e. A reduction of 13 percent was needed to reduce 2004 levels to 1990 levels. A series of early actions, tailpipe regulations, and the development of fuels with less carbon in them are estimated to provide reductions totaling 66 million tons of CO_2e.

CARB prepared a Scoping Plan to develop programs and measures to address the remaining 107 million tons of CO_2e in order to reach the total of 173 million tons by the year 2020. The Scoping Plan contains the main strategies California will implement to reduce CO_2e emissions by 169 million MT, or approximately 30 percent, from the State's projected 2020 emissions level of 596 million MT CO_2e under a business as usual (BAU) scenario. (This is a reduction of 42 million MT CO_2e, or almost 10 percent, from 2002–2004 average emissions, but requires the reductions in the face of population and economic growth through 2020.) The Scoping Plan also breaks down the amount of greenhouse gas emissions reductions ARB recommends for each emissions sector of the State's greenhouse gas inventory. The Scoping Plan calls for the largest reductions in greenhouse gas emissions to be achieved by implementing the following measures and standards:

- Improved emissions standards for light-duty vehicles (estimated reductions of 31.7 million MT CO2e);
- The Low-Carbon Fuel Standard (15.0 million MT CO2e);
- Energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 million MT CO2e); and
- A renewable portfolio standard for electricity production (21.3 million MT CO2e).

The Scoping Plan identifies the role of local governments with the following language:

> *"Local Government Targets: In recognition of the critical role local governments will play in the successful implementation of AB 32, ARB added a section describing this role. In addition, ARB recommended a greenhouse gas reduction goal for local governments of 15 percent below today's levels by 2020 to ensure that their municipal and community-wide emissions match the State's reduction target."*[48]

The Scoping Plan encourages local governments to adopt goals for reducing municipal greenhouse gas emissions and move towards adoption of a goal for reducing community emissions. These targets should parallel the State's commitment to reduce greenhouse gas emissions by approximately 15 percent of current levels by 2020.[49] The Scoping Plan also observes that "[l]ocal governments have the ability to directly influence both the siting and design of new residential and commercial developments in a way that reduces greenhouse gases associated with vehicle travel, as well as energy, water, and waste"[50] and that "[i]ncreasing low-carbon travel choices (public transit, carpooling, walking and biking) combined with land use patterns and infrastructure that support these low-carbon modes of travel, can decrease average vehicle trip lengths by bringing more people closer to more destinations."[51] It also notes that targets will be set and achieved on a regional basis through the SB 375 implementation process, which "maintains regions' flexibility."

Senate Bill 375

Senate Bill 375 (SB 375), which establishes mechanisms for the development of regional targets for reducing passenger vehicle greenhouse gas emissions, was adopted by the State on September 30, 2008. SB 375 requires CARB to develop vehicular greenhouse gas emissions regional reduction targets for 2020 and 2035 by September 30, 2010 in consultation with metropolitan planning organizations. SB 375 recognizes the importance of achieving significant greenhouse gas reductions by changing land use patterns and improving transportation alternatives. Through the SB 375 process, metropolitan planning organizations will develop sustainable communities strategies designed to integrate development

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48 CARB, December, 2008, Climate Change Scoping Plan.
49 CARB, December, 2008, Climate Change Scoping Plan, p. 27.
50 CARB, December, 2008, Climate Change Scoping Plan, p. 26.
51 CARB, December, 2008, Climate Change Scoping Plan, p. 48.

patterns and the transportation network in a way that reduces greenhouse gas emissions while meeting housing needs and other regional planning objectives. However, the planning processes to implement SB 375 are only at the beginning stages and no sustainable communities' strategies have been adopted to date.

Senate Bill 97

The provisions of Senate Bill 97 (SB 97), enacted in August 2007, direct the Office of Planning and Research (OPR) to propose CEQA Guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions." As per SB 97 directives, the OPR released the *Preliminary Draft CEQA Guideline Amendments for Greenhouse Gas Emissions* (Draft CEQA Guideline Amendments) on January 8, 2009. In addition, an OPR technical advisory (see below), titled *CEQA and Climate Change*, was released in July 2008 and informs the analysis in this EIR.

The State Resources Agency certified and adopted the CEQA guideline amendments on December 29th 2009, and the California Office of Administrative Law (OAL) codified them into law on February 16, 2010, which become effective on March 18, 2010. OPR does not identify a threshold of significance for greenhouse gas emissions, nor has it prescribed assessment methodologies or specific mitigation measures. The amendments encourages lead agencies to consider many factors in performing a CEQA analysis, but preserves the discretion granted by CEQA to lead agencies in making their own determinations based on substantial evidence. The amendments also encourage public agencies to make use of programmatic mitigation plans and programs from which to tier when they perform individual project analyses. The technical advisory suggests three components for CEQA disclosure: quantification of greenhouse gas emissions from a project's construction and operation, determination of significance of the project's impact to climate change, and if the project is found to be significant, the identification of suitable alternatives and mitigation measures. The analysis contained herein follows this guidance.

CEQA Guideline Amendments for Greenhouse Gas Emissions. The adopted CEQA Guideline Amendments have added new text pertaining to greenhouse gas emissions to the existing CEQA Guidelines (Title 14, Chapter 3 of the California Code of Regulations). A summary of the proposed text revisions is provided below.

Section 15064.4. Determining the Significance of Impacts from Greenhouse Gas Emissions. This section was added to clarify a lead agency's responsibility in assessing greenhouse gas impacts. The section states that "The determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in section 15064. A lead agency should make a good-faith effort, based on the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project." However, the adopted guidelines leave the model and methodology in which these emissions are quantified up to the discretion of the lead agency.

The text does provide general considerations that should be weighed when determining the significance of an effect:

- The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and
- The extent to which the project complies with regulations or requirements adopted to implement a qualified statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions.

Section 15126.4 Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects. The text in this section states that lead agencies "shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of greenhouse gas emissions" associated with the project. As stated in the adopted guidelines, "Measures to mitigate the significant effects of greenhouse gas emissions may include, among others:

- Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;
- Reductions in emissions resulting from a project through implementation of project features, project design, or other measures;
- Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions;
- Measures that sequester greenhouse gases; and
- In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions, mitigation may include the identification of specific measures that may be implemented on a project-by-project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effects of emissions."

Section 15130. Discussion of Cumulative Impacts. The text in this section states that the project should be considered in the context of past, current, and foreseeable development to determine if a cumulatively considerable impact would result.

Proposed CEQA Checklist Questions. Appendix G of the CEQA Guidelines contains a sample checklist that may be used by lead agencies when considering environmental impacts. Two new checklist questions have been added for greenhouse gas emissions:

- Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Would the project conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The checklist questions are not necessarily intended to serve as significance criteria. Development of significance criteria is left to the discretion of local lead agencies.

OPR Technical Advisory, CEQA and Climate Change. On June 19, 2008, OPR published a technical advisory on CEQA and Climate Change. The technical advisory is one in a series of advisories published by OPR as a service to professional planners, land use officials, and CEQA practitioners. The advisory provides OPR's perspective on the emerging role of CEQA in addressing climate change and greenhouse gas emissions, while recognizing that approaches and methodologies for calculating greenhouse gas emissions and addressing environmental impacts through CEQA review are rapidly evolving. The advisory recognizes that OPR will develop, and the Resources Agency will adopt, amendments to the CEQA Guidelines pursuant to SB 97. In the interim, the technical advisory "offers informal guidance regarding the steps lead agencies should take to address climate change in their CEQA documents."[52]

The technical advisory points out that neither CEQA nor the CEQA Guidelines prescribe thresholds of significance or particular methodologies for performing an impact analysis. OPR recommends that "the global nature of climate change warrants investigation of a statewide threshold of significance for greenhouse gas emissions."[53] Until such a standard is established, OPR advises that each lead agency should develop its own approach to performing an analysis for projects that generate greenhouse gas emissions.[54]

OPR sets out the following process for evaluating greenhouse gas emissions. First, agencies should determine whether greenhouse gas emissions may be generated by a proposed project, and if so, they should quantify or estimate the emission by type or source. Calculation, modeling, or estimation of greenhouse gas emissions should include the emissions associated with vehicular traffic, energy consumption, water usage, and construction activities.[55]

Agencies should then assess whether the emissions are "cumulatively considerable" even through a project's greenhouse gas emissions may be individually limited. OPR states: "Although climate change is ultimately a cumulative impact, not every individual project that emits greenhouse gases must necessarily be found to contribute to a significant cumulative impact on the environment."[56] Individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice.[57]

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52 OPR, Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through CEQA Review, June 19, 2008, p.2.

53 OPR, Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through CEQA Review, June 19, 2008, p. 4.

54 OPR, Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through CEQA Review, June 19, 2008, p. 5.

55 OPR, Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through CEQA Review, June 19, 2008, p. 5.

56 OPR, Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through CEQA Review, June 19, 2008, p. 6.

57 OPR, Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through CEQA Review, June 19, 2008, p. 6.

Finally, if the lead agency determines emissions are a cumulatively considerable contribution to a significant cumulative impact, the lead agency must investigate and implement ways to mitigate the emissions.[58] OPR states:

> Mitigation measures will vary with the type of project being contemplated, but include alternative project designs or locations that conserve energy and water, measures that reduce vehicle miles travelled (VMT) by fossil-fueled vehicles, measures that contribute to established regional or programmatic mitigation strategies, and measures that sequester carbon to offset the emissions from the project.[59]

OPR concludes that "[a] lead agency is not responsible for wholly eliminating all greenhouse gas emissions from a project; the CEQA standard is to mitigate to a level that is 'less than significant'."[60] The technical advisory includes a list of mitigation measures that can be applied on a project-by-project basis.

Bay Area Air Quality Management District Draft CEQA Guidelines

The Bay Area Air Quality Management District (BAAQMD) is in the process of updating its CEQA Guidelines. The thresholds of significance proposed in the *Draft BAAQMD CEQA Guidelines* were developed to assist local jurisdictions and agencies in complying with the requirements of CEQA regarding potentially adverse impacts to air quality and the global climate. The *Draft BAAQMD CEQA Guidelines* include plan-level thresholds, thresholds intended to be used to assess the significance of programmatic actions, and project-level thresholds, thresholds intended to address the impacts of individual development projects. The December 2009 *Draft BAAQMD CEQA Guidelines* state that a project would be considered to have a less-than-significant impact if it would meet at least one of the following thresholds:

For Project-Level Actions:

- Be consistent with the policies of a qualified Climate Action Plan;
- Produce total emissions of no more than 1,100 MT CO_2e annually; or
- Produce emissions of no more than 4.6 MT CO_2e per service population[61] annually.

As these standards have not yet been adopted and will not be retroactive, they are not being applied to the SUMC Project. However, this EIR evaluates the SUMC Project's consistency with the City's Climate Protection Plan, including a threshold which requires the SUMC Project to achieve a reduction

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58 OPR, Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through CEQA Review, June 19, 2008, p. 6.

59 OPR, Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through CEQA Review, June 19, 2008, p. 6-7.

60 OPR, Technical Advisory, CEQA and Climate Change: Addressing Climate Change Through CEQA Review, June 19, 2008, p. 7.

61 The per service population emissions total includes both the residents and employees of a proposed development project.

of emissions which is 30 percent below business as usual ("BAU") emissions. This threshold is based upon the City's Climate Protection Plan reduction target which needs to be achieved by year 2020. The EIR analysis compares BAU for the SUMC Project at SUMC Project buildout in year 2025. While the SUMC Project buildout year is later than the City's Climate Protection Plan reduction target date, it is important to analyze the impacts of the SUMC Project at buildout in order to encompass the whole of the SUMC Project and compare SUMC Project generated emissions with the reduction target in the City's Climate Protection Plan.

The BAAQMD is currently updating the 2009 Clean Air Plan for the San Francisco Air Basin. This plan is expected to apply consistent regulatory control over construction emissions, thus, precluding the need for construction-related greenhouse gas mitigation. Proposed greenhouse gas emissions thresholds in the *Draft BAAQMD CEQA Guidelines* do not consider the construction emissions associated with individual development projects to be significant with the inclusion of reduction measures, however the quantification of construction emissions have been included in this document for informational purposes. The BAAQMD recommended reduction measures for construction include:

- Alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet;
- Local building materials of at least 10 percent; and
- Recycle at least 50 percent of construction waste or demolition materials.

Bay Area Regional Agency Climate Protection Program

The Joint Policy Committee (composed of the Association of Bay Area Governments [ABAG], BAAQMD, BCDC, and Metropolitan Transportation Commission [MTC]) approved the Bay Area Regional Agency Climate Protection Program on May 4, 2007 (amended July 20, 2007) to reduce potential effects of climate change. This program includes strategies to:

- Establish management priorities based on impacts, benefits, ease of implementation, and cost-effectiveness;
- Increase public awareness and motivate action through workshops and grass-roots outreach;
- Provide assistance such as standardization of procedures for determining impacts, maintaining and distributing data, model codes and other tools, funding for demonstration projects, and others;
- Reduce driving and promote alternative modes of transportation through mechanisms such as road pricing, mode competitiveness, and regional development planning;
- Prepare to adapt, because regardless of regional reductions in potential causes contributing to global climate change, the region will be affected by changing environmental conditions; and
- Increase the importance of CEQA review of CO_2 emissions, conduct life-cycle costing of all capital projects, encourage energy-efficient development with sliding-scale permit fees, rebates

and expedited permit review processes, and return the region's freeways to a maximum of 55 miles per hour.

City of Palo Alto Climate Protection Plan

The Palo Alto Climate Protection Plan was adopted in December 2007, and suggests a variety of possible actions to reduce greenhouse gas emissions in each of six general categories, including utilities, sustainable purchasing, transportation and sustainable land use, green building, zero waste, and education and motivation. The Climate Protection Plan includes a baseline inventory of the City's municipal and community (businesses, residents and workers) emissions (provided previously under Palo Alto Inventory), citywide emissions reduction targets, and a number of goals and strategies for obtaining those targets. The City's reduction targets for municipal and community emissions are as follows:

- By 2009, the City will reduce emissions by 5 percent from 2005 emission levels for a total reduction of 3,266 MT of CO_2.
- By 2012, the City and Community will reduce emissions by 5 percent from 2005 emissions levels for a total reduction of 39,702 MT of CO_2.
- By 2020, the City and Community will reduce emissions by 15 percent of 2005 levels, equal to 119,140 MT of CO_2. This will bring the community in line with State reduction goals of 427 million metric tons of carbon dioxide equivalent emissions in 2020, a number 30 percent below the BAU emission levels projected for 2020, or about 15 percent from today's levels.

Like many early iteration plans, the City of Palo Alto Climate Protection Plan did not expressly address growth in economic activity in its goals. However, the Plan is aligned with and based on the reduction mandates in AB 32. In its implementation of AB 32, the California Air Resources Board's (CARB) Scoping Plan recognizes the need to account for population and economic growth and incorporates a 30 percent reduction target from 2020 projected BAU emissions limits. Thus, the City's Climate Protection Plan's incorporation of a BAU approach to quantify emissions from significant, new projects which were not included in the City's existing inventory is consistent with the CARB's Scoping Plan. Goals and actions from the Climate Protection Plan that are relevant to the SUMC Project are listed in Table 3.6-6 in the Impacts and Mitigation Measures subsection.

State Building Standards

California has achieved substantial energy savings and emissions reductions through implementation of aggressive building and appliance standards and utility energy efficiency programs. CARB's Scoping Plan (see discussion of AB 32, above) reported:

> These combined efforts are saving more than 40,000 GWh of electricity annually—enough to power almost six million California homes. Due in part to these successful policies, California uses less electricity per person than any other state in the nation.[62]

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[62] CARB, December, 2008, Climate Change Scoping Plan, Appendix C, p. C-90.

However, in spite of these savings, the Scoping Plan notes that "[c]ollectively, energy use and related activities by buildings are the second largest contributor to California's greenhouse gas emissions."[63]

Title 24, Part 6, of the California Code of Regulations (CCR), Energy Efficient Standards for Residential and Nonresidential Buildings (also referred to as the California Energy Code), was adopted in 1978 by the CEC in response to a legislative mandate to reduce California's energy consumption. Title 24, Part 6 is updated frequently, with the most recent update occurring in 2008. Title 24, Part 6 requires to the incorporation of energy conserving features in new construction, and alterations and additions to existing buildings. Although it was not originally intended as a climate change policy, by reducing California's energy consumption, Title 24, Part 6, has become a means of reducing California's greenhouse gas emissions. Energy efficient buildings require less electricity, which results in fewer greenhouse gas emissions.

On July 17, 2008, the California Building Standards Commission (CBSC) adopted the California Green Building Code, which is being codified in Title 24, Part 11, of the California Code of Regulations. As CARB's Scoping Plan explains, "[w]hile the current version of the commercial green building code is voluntary; the CBSC anticipates adopting a mandatory code in 2011, which will institute minimum environmental performance standards for all occupancies."[64]

Hospital buildings are subject to distinct building code requirements administered by the Office of Statewide Health Planning and Development (OSHPD). OSHPD has not adopted Title 24, Part 6. However, OSHPD has adopted portions of the California Green Building Code relating to energy efficiency, material conservation and resource efficiency, and environmental quality. Compliance with the OSHPD green building code requirements is voluntary at this time.

City of Palo Alto Building Standards

On June 2, 2008, the Palo Alto City Council adopted Ordinance 5006, a mandatory Green Building Ordinance that is applicable to residential and non-residential private development projects subject to the City's building codes. The ordinance became effective on July 3, 2008 and is retroactive for commercial projects for which planning applications were submitted after December 3, 2007, the date the City Council adopted the Climate Protection Plan. Because hospital buildings are not subject to the City's building codes, the City's Green Building Ordinance is not applicable to the hospital components of the SUMC Project; however, it would be applicable to clinic, medical office, SoM FIM, and research buildings that require City building permits.

Ordinance 5006 states that the City Council "shall establish by resolution, and shall periodically update as necessary, Green Building Standards for Compliance."[65] The current standards for compliance require that new nonresidential construction of greater than 25,000 square feet achieve a minimum Leadership in Energy and Environmental Design (LEED) rating of "silver", or 33 points.

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63 CARB, December, 2008, Climate Change Scoping Plan, p. 57.
64 CARB, December, 2008, Climate Change Scoping Plan, p. 57.
65 City of Palo Alto, Municipal Code Section 18.44.040 (not yet codified).

In addition, revisions in Architectural Review Approval Finding #15 that became effective on October 11, 2007[66] require that projects "exhibit green building and sustainable design," taking into account the following considerations:

- Optimize building orientation for heat gain, shading, daylighting, and natural ventilation;
- Design landscaping to create comfortable micro-climates and reduce heat island effects;
- Design for easy pedestrian, bicycle and transit access;
- Maximize on-site stormwater management through landscaping and permeable paving;
- Use sustainable building materials;
- Design lighting, plumbing and equipment for efficient energy and water use;
- Create healthy indoor environments; and
- Use creativity and innovation to build more sustainable environments.

Impacts and Mitigation Measures

Standards of Significance

The CEQA Guidelines do not provide numeric or qualitative thresholds of significance for greenhouse gas emissions. The CEQA Guideline Amendments, adopted in December 2009, state that each local lead agency must develop its own significance criteria based on local conditions, data, and guidance from public agencies and other sources. However, the CEQA Guidelines have included the following guidelines for assessing the significance of greenhouse gas emissions. Would the project:

- Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?
- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

For the purposes of this analysis and based on full consideration of the available information, the SUMC Project would result in a cumulatively considerable contribution to significant climate change impacts if it would:

- Fail to further the goals and policies established in the City's Climate Protection Plan; or
- Not reach a 30 percent reduction of 2020 BAU emissions.

The City's Climate Protection Plan provides a roadmap that the City of Palo Alto intends to follow in complying with the State of California's greenhouse gas emissions goals. While the City has not mandated specific measures for individual private projects, its goals and policies are a useful tool for evaluating whether an individual project would do its part to minimize its contribution to emissions of

[66] City of Palo Alto, Municipal Code Section 18.76.020(d)(15) (not yet codified).

greenhouse gases. The City recognizes that meeting the State's goals will require both substantial reductions in emissions from existing sources, and reductions in emissions from new sources compared to a "business as usual" standard. A project that furthers the City's Climate Protection Plan policies would be a project that minimizes its emissions of greenhouse gases by including design features and commitments that implement the relevant policies of the Climate Protection Plan and which mitigates emission increases wherever possible.

As stated in the adopted guidelines, "Measures to mitigate the significant effects of greenhouse gas emissions may include, among others:

- Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;
- Reductions in emissions resulting from a project through implementation of project features, project design, or other measures;
- Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions; and
- Measures that sequester greenhouse gases.

Construction Emissions

As stated in the Applicable Plans and Policies section, above, the draft BAAQMD CEQA Guidelines do not consider construction-phase emissions from individual development projects to be significant, provided they include the recommended reduction measures. A discussion of construction emissions is provided in the analysis below for informational purposes. The BAAQMD recommended reduction measures for construction include:

- Alternative-fueled (e.g., biodiesel, electric) construction vehicles/equipment of at least 15 percent of the fleet;
- Local building materials of at least 10 percent; and
- Recycle at least 50 percent of construction waste or demolition materials.

Environmental Analysis

CC-1. Furthering Goals and Policies of the Palo Alto Climate Protection Plan. The proposed Emissions Reduction Program would minimize greenhouse gas emission increases associated with the proposed development program. However, the proposed Emissions Reduction Program would not be sufficient to further the goals of the City's Climate Protection Plan. (S)

Greenhouse gas emissions would be generated during operation and construction of the SUMC Project facilities. An inventory of the net change in three key greenhouse gas emissions (CO_2, CH_4, and N_2O) that would be emitted as a result of the SUMC Project is presented below. This inventory is discussed in context of the City's greenhouse gas reduction goals, and the proposed Emissions Reduction Program as compared to the goals and actions of the Palo Alto Climate Protection Plan.

The proposed Emissions Reduction Program includes a number of design features and measures that would reduce energy use, water consumption, landfilled solid waste, and trip generation. (As stated previously, greenhouse gas emissions from water consumption is not attributable to the SUMC Project since the SFPUC's Hetch Hetchy water system operates hydroelectric generation facilities that power the treatment and transportation of the potable water system, and the generation of this renewable energy offsets the emissions of greenhouse gases associated with water consumption from the SUMC Project.) Table 3.6-5, which discusses consistency of the SUMC Project with the City's Climate Protection Plan, indicates which of the design features under the proposed Emissions Reduction Program are currently being implemented and are included in the SUMC Project inventory and which would be new features that would result in additional emissions reductions. The assessment of consistency with the Climate Protection Plan is based on the City's review of the proposed measures.

The inventory of SUMC Project emissions that is provided in this subsection is based upon standard construction practices and energy use at hospital, clinic, and research facilities. As discussed further below, the SUMC Project sponsors propose to design the new facilities so that they would use less energy demand than under standard practices. As part of the SUMC Project, SHC and LPCH have committed to design their new facilities such that they will use 35 percent less energy than typical hospitals (based on a comparison to the Department of Energy's Commercial Buildings Energy Consumption Survey) and 20 percent less energy than a hospital designed to meet ASHRAE 90.1 standards. The SoM has committed to design its new facilities such that they will meet Stanford University's 2008 Building Performance Guidelines, which set a target energy efficiency in new buildings of 30 percent below California Title 24 (2006 standards)/ASHRAE 90.1. The greenhouse gas emissions reductions associated with these energy reductions are quantified at the end of this subsection.

The implications of the SUMC Project greenhouse gas emissions are analyzed here qualitatively and quantitatively. The qualitative analysis provides a comparison of the SUMC Project, including the proposed Emissions Reduction Program, with the goals and policies in the City's Climate Protection Plan. The quantitative analysis identifies the emissions reduction with the proposed Emissions Reduction Program, and compares the SUMC Project greenhouse gas emissions, after implementation of the proposed Emissions Reduction Program, with emissions that would occur under the business as usual scenario, as defined by CARB's *Climate Change Scoping Plan* (see discussion under Applicable Plans and Regulations).

It should be noted that SHC and LPCH have expressed their willingness to consider adding purchase of Caltrain GO Passes for all eligible employees to their ongoing TDM programs. Greenhouse gas emissions reductions associated with the reduction in vehicle miles traveled from use of the GO Pass or equivalent TDM measure are not quantified as part of the emissions reduction resulting from the proposed Emissions Reduction Program. However, implementation of the GO Pass or equivalent TDM measure is identified as part of Mitigation

Measure TR-2.3 in Section 3.4, Transportation, and quantification of the greenhouse gas reduction with the GO Pass or equivalent TDM measure is provided under the post-mitigation scenario in this section.

Operational Emissions. Direct sources of greenhouse gas emissions from operation of SUMC Project facilities would include emissions from natural gas combustion, diesel emissions from emergency generators, fleet vehicle emissions, medical nitrous oxide, and helicopter emissions. Indirect emissions from operation of SUMC Project facilities would include electricity production, water use, wastewater generation, solid waste generation, steam production, and chilled water production. In addition, greenhouse gas emissions associated with employee, patient, and visitor trips to and from the SUMC Sites would also occur. These sources are quantified below.

Methods similar to those used to quantify existing greenhouse gas emissions at the SUMC Sites (see Existing Conditions) were applied to the SUMC Project to obtain an estimate of the net annual increase in greenhouse gas emissions associated with the SUMC Project. The SUMC Project inventory is based on the following additional assumptions:

- *Natural Gas.* The SUMC Project facilities would use natural gas for cooking in the hospital kitchen. The net increase in natural gas usage would be less than 12 therms per hour.[67]

- *Medical Nitrous Oxide.* Use of medical nitrous oxide would increase by approximately 70 percent based on an increase in operating space with the new SCH hospital building and the increase in radiology department treatments.

- *Fleet Vehicle Fuels and Helicopter Fuel.* Helicopter trips would increase by 28 percent based on the combined increase in inpatient discharges predicted for the SHC and LPCH hospitals. Fleet vehicle trips also would increase according to the increase in inpatient discharges for both the SHC and LPCH hospitals. This increase would result in a 28 percent increase in fleet vehicle fuel consumption.

- *Electricity, Steam, and Chilled Water.* New buildings would have energy usage intensity equivalent to that of existing buildings. This assumption is conservative because it does not account for the new energy conservation measures proposed under the SUMC Project, nor does the inventory make any assumptions about potential improvements in efficiency at the CEF. However, the existing facilities do implement a number of energy efficiency programs, which are included in the SUMC Project inventory. Both existing and new energy efficiency programs are identified in Table 3.6-5. This assumption affects the emissions projections for electricity, chilled water, and steam emissions.

- *Non-fleet Vehicle Trips.* The SUMC Project inventory includes quantification of the emissions associated with employee, patient, and visitor vehicles traveling to and from the SUMC Sites, based on VMT to and from the SUMC facilities. SUMC Project VMT was

[67] Stanford University, response to Data Request 4, February 20, 2008.

calculated using similar methods to those reported in the Existing Conditions subsection, except that trip generation was scaled according to the increase in square footage and activity.

It is important to recognize that the SHC and LPCH are not meeting all of the existing demand for hospital facilities; therefore, some of the trips associated with the SUMC Project are trips that already are occurring in the region as patients seek healthcare elsewhere and medical employees meet those needs at other hospitals. Also, a substantial portion of the emissions in this category could occur whether or not the SUMC Project is approved. This is because people are likely to seek the type of medical services provided by the SHC and LPCH whether those services are offered at SHC and LPCH or at some other hospital. However, it is uncertain what percentage of the projected trips would occur if the SUMC Project were not implemented. All emissions associated with the projected SUMC Project VMT are conservatively reported in the SUMC Project inventory.

Existing SHC, LPCH, and SoM TDM program is incorporated in the SUMC Project inventory. However, as discussed previously, new transportation improvements are not incorporated.

- *Solid Waste.* At 2025 full buildout, the SUMC Project would result in a net increase in landfilled solid waste of approximately 1,792 tons annually, as discussed in Section 3.13, Utilities. This increase would be approximately two percent of the total landfilled solid waste generated annually in the City.

Estimated greenhouse gas emissions associated with the SUMC Project are summarized in Table 3.6-4. As discussed in the Existing Conditions subsection, the existing SUMC facilities are assumed to produce approximately 164,964 MT CO_2e of greenhouse gases annually. The SUMC Project operations would result in a net annual emissions increase of up to 74,803 MT of CO_2e, which is a 31 percent increase over the existing emissions generated at the SUMC Sites.

Emissions Reductions. On December 3, 2007, the Palo Alto City Council adopted the *Palo Alto Climate Protection Plan*. The purpose of the Climate Protection Plan is to present a comprehensive inventory of Palo Alto's municipal (City government-generated) and community-generated CO_2 emissions, to set citywide reduction targets, and to propose practical steps to reach those targets. The Climate Protection Plan has a short-term target of reducing City-generated emissions of CO_2 by 5 percent of 2005 emission levels by 2009. The medium-term target is for the City and community to collectively reduce, by 2012, CO_2 emissions by 5 percent as compared with 2005 emissions levels. Finally, the long term target is for the City and community to collectively reduce, by 2020, CO_2 emissions by 15 percent as compared to 2005 emissions levels. As discussed above, this is equivalent to a 30 percent reduction target from 2020 projected BAU emissions. In order to capture full project build out, instead of using a projected year of 2020, this analysis used a projected year of 2025. This analysis applies the 2020 reduction goal (equivalent to 30 percent below BAU) of the City Climate Protection Plan as a target threshold for compliance.

Table 3.6-4
Net SUMC Project Greenhouse Gas Emissions, 2025

Source of Emissions	Units Consumed, Net Increase	Net Emissions (metric tons CO_2e)
Natural Gas (therms)	5,137	27
Diesel Generators (gallons)	2,232	23
Medical Nitrous Oxide (cubic feet)	6,127	99
Fleet Vehicle Fuels (gallons)	13,845	100
Helicopter Fuel (gallons)	21,083	201
Electricity (MWh) [a]	54,640	12,914
Steam and Chilled Water (million Btu)	10,995	19,542
Non-fleet Vehicular Emissions (VMT)[b]	275,566	41,257
Solid Waste (tons)[c]	1,792	640
Total		**74,803**

Source: Mazzetti and Associates Consultants and Engineers, 2008, Stanford University Medical Center 2007 Greenhouse Gas Inventory. Additional data provided by PBS&J, 2010 (Appendix H).

Notes:

a. The Mazzetti and Associates inventory (sourced for this table) used an electricity emission factor of 263.62 lbs CO_2/MWh, cited to CPAU. However, the City has indicated that this emissions factor does not apply to the development on the SUMC Sites and requested that the inventory be revised using CO_2 emissions factor of 520 lbs CO_2/MWh based on the City's energy purchasing records, and CCAR's standard emissions factors for N_2O and CH_4 (0.0037 lbs N_2O/MWh and 0.0067 lbs CH_4/MWh). The electricity emissions in this table represent the use of the revised emission factors

b. Calculated using VMT assumptions reported in AECOM Transportation (Appendix E). Emissions were modeled using the VMT assumptions from AECOM in the URBEMIS 2007 software. Based on VMT of 275,566, which varies slightly from the VMT in the AECOM memo (275,837 VMT) due to rounding purposes for the URBEMIS model.

c. SUMC solid waste emissions were determined based on total City wide emissions. Existing SUMC solid waste generation is 5 percent of City wide waste generation therefore emissions attributed to SUMC generation was determined to be 5 percent of total City wide waste emissions.

The Climate Protection Plan is divided into six sections that contain goals for achieving the City's emissions reduction targets. The left-hand column in Table 3.6-5 presents goals set forth in the Climate Protection Plan that are relevant to the SUMC Project. A number of "actions," strategies outlined by the City for achieving the Climate Protection Plan goals, are also listed. Many of the goals listed in Table 3.6-5 were tailored for implementation by the City and pertain to municipal emissions. However, the goals have been interpreted broadly in this EIR and have been compared with the SUMC Project where possible. This table outlines any existing programs the SUMC Project would be subject to as well as the SUMC's proposed emission reduction features. If the SUMC Project fails to comply with the Climate Protection Plan policies, mitigation is presented which would help to bring the SUMC Project into compliance.

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
	Utilities	
Reduce electricity and natural gas use through conservation and energy efficiency.	**Existing Emissions Reduction Program:** *Energy Conservation Initiatives.* Independent of the SUMC Project, the hospitals' Engineering & Maintenance department is engaged in numerous conservation initiatives: • The department has instituted a bulb-wattage improvement campaign, changing to electronic ballasts along with more energy efficient florescent bulbs, starting in all public areas. In FY 2007, the department purchased and installed over 8,000 T-8 bulbs, connected to over 500 new electronic ballasts. The department is also replacing burned out incandescent bulbs with compact florescent lights. • Seven years ago, the department changed from light switches in all mechanical spaces to light timer switches. Four years ago, the department improved this practice by changing to digital switches with motion-detection devices. • Ten years ago, the department began changing out air handler motors to Variable Frequency Drives (VFDs) during equipment replacement and upgrade efforts. • The department is beginning to replace lighted exit signs with LED or phosphorescent exit signs. • The department has enrolled in the City of Palo Alto's Compressed Air Management Program and will complete an analysis for potential further energy savings. **Proposed Emissions Reduction Programs:** *Enhanced Energy Efficiency - Hospitals and Clinics.* As part of the SUMC Project, the SHC and LPCH components of the SUMC Project would be designed to achieve Energy Star scores of 90-95, which means they would perform better than 90-95 percent of similar hospitals. The buildings would use 35 percent less energy than typical hospitals (based on a comparison to the Department of Energy's Commercial Buildings Energy Consumption Survey) and 20 percent less energy than a hospital designed to meet ASHRAE 90.1 standards. Specific measures to achieve this level of conservation are described under Green Building, below. • *Enhanced Energy Efficiency - School of Medicine.* As part of the SUMC Project, the new SoM buildings would meet Stanford University's 2008 Building Performance Guidelines, which set a target energy efficiency in new buildings of 30 percent below California Title 24/ASHRAE 90.1 (2004). These buildings would feature a combination of state-of-the-art energy efficiency measures to achieve these goals, including exterior sunshades to reduce solar loads, highly insulated building shells and fenestration, building level heat recovery, high efficiency building lighting systems, high efficiency HVAC equipment, use of passive cooling, and smart building technology to coordinate building systems operation with occupancy and use patterns. These buildings would be provided with full energy metering, and energy use would be closely monitored after commissioning to assure that building systems are operating as intended and that energy goals are being met. However, an audit would be necessary to verify compliance with the City's Climate Protection Plan Policies	No

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
	Mitigation Measure: *Commissioning and Retro-Commissioning of Energy Systems for New and Existing Buildings*. New construction and existing buildings altered by construction of the SUMC Project shall undergo commissioning[68] of energy and HVAC systems during construction and on an annual basis during the first five years of operation. The commissioning process shall follow the standards of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Guideline 0-2005 or the International Performance Measurement and Verification Protocol (MVP). This process would ensure that new and existing energy systems would perform interactively according to construction documents, the project design intent and the owner's operational needs.	Yes
Expand use of renewable energy installed or purchased directly by customers. Reduce carbon intensity of energy supply.	**Existing Emissions Reduction Program (with proposed expansion):** *Purchase of Electricity and Natural Gas from City*. The SUMC Project sponsors would obtain electricity and natural gas from the City of Palo Alto Utilities Department. The City has adopted a 10-year energy efficiency plan; one of the plan's goals is to meet up to 33 percent of the City's electricity needs through renewable sources of power, such as wind, landfill gas, and solar, by the year 2015. However, the SHC, LPCH and SoM have not committed to expanding renewable energy facilities on the SUMC Sites. Given the extent to which the facilities on the SUMC Sites contribute to the City's overall energy demand, the lack of definite commitments to directly install new renewable energy facilities would be inconsistent with the Climate Protection Plan.	**No**
	Mitigation Measures: Participation in Palo Alto Green Energy Program. Under the PaloAltoGreen program, residential, business and industrial customers purchase renewable energy equivalent to their electricity needs at an additional cost of 1.5 cents per kilowatt hour (kWh) above standard electric rates. The SHC and LPCH facilities shall participate in this program to offset electricity emissions, or alternatively, develop new renewable generation sources in collaboration with the CPAU.	Yes

[68] According to the U.S. Department of Energy: "Building commissioning is a systematic process of ensuring that a building performs in accordance with the design intent, contract documents, and the owner's operational needs. Due to the sophistication of building designs and the complexity of building systems constructed today, commissioning is necessary, but not automatically included as part of the typical design and construction process. Commissioning is critical for ensuring that the design developed through the whole-building design process is successfully constructed and operated." Commissioning includes the following activities: 1) Systematically evaluating all pieces of equipment to ensure that they are working according to specifications. This includes measuring temperatures and flow rates from all HVAC devices and calibrating all sensors to a known standard. 2) Reviewing the sequence of operations to verify that the controls are providing the correct interaction between equipment. Additional information is available at: http://www1.eere.energy.gov/buildings/commercial/commissioning.html

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
Participate in and promote greenhouse gas emissions inventory tracking and reporting.	*Inventory Greenhouse Gas Emissions*. An inventory of existing and projected future emissions associated with SUMC Site development has been prepared and is summarized in this document. Preparation of this inventory implements this Climate Protection Plan policy. However, the SHC, LPCH and SoM do not regularly report their greenhouse gas emissions to the City, which impedes the City's ability to develop comprehensive Emissions Reduction Programs that include these entities.	**No**
	Mitigation Measure *Annual Greenhouse Gas Reporting*. The SHC and LPCH shall perform an annual inventory of greenhouse gas emissions associated with hospital and medical facilities on the SUMC Sites. This inventory shall be performed according to a common industry-standard emissions reporting protocol, such as the approaches recommended by California Air Resources Board, The Climate Action Registry, or Business Council for Sustainable Development (BCSD). This inventory shall be shared with the City of Palo Alto to facilitate the development of future collaborative Emissions Reduction Programs. Emissions associated with energy, water, solid waste, transportation, employee commute and other major sources shall be reported in this inventory.	Yes
Promote and implement climate-neutral alternatives and education.	**Existing Emissions Reduction Program:** *Participation in Sustainability Working Group*. SHC and the SoM are represented in the Stanford Sustainability Working Group, which was formed in 2007 and is chaired by Stanford's Department of Sustainability and Energy Management. The Working Group is spearheading a number of sustainability initiatives, including programs to evaluate measures for energy conservation and efficiency, clean energy supply and development, and reduction of greenhouse gas emissions.	Yes
Employ urban forest opportunities to reduce energy and increase carbon sequestration.	**Proposed Emissions Reduction Program:** *Expansion of Urban Forest per SUMC Design Guidelines*. The SUMC Design Guidelines submitted as part of the SUMC Project describe tree planting along streets and in landscaped areas throughout the SUMC Sites that would be carried out as part of the SUMC Project. The Guidelines include diagrams and principles to extend the Stanford University arboretum area into the Main SUMC Site near LPCH, and to establish a cohesive pattern of street, axis, passage and garden trees throughout the SUMC Sites. In addition, in implementing the SUMC Project, the SUMC Project sponsors would comply with the tree replacement ratios specified in the City's Tree Technical Manual to offset removal of protected trees.	Yes
Coordinate energy-related climate activities with building and urban planning activities.	**Proposed Emissions Reduction Program:** The SUMC Project would be planned and designed to achieve significant energy savings. Specific energy saving building features are described under the Green Building heading, below.	Yes

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
	Sustainable Purchasing	
Adopt and implement a Sustainable Purchasing Policy. Consider environmental costs in purchasing decisions.	**Existing Emissions Reduction Programs:** *Sustainable Purchasing Policies - Hospitals and Clinics*. There are numerous programs at the SHC and LPCH hospitals that focus on environmentally preferable purchasing. The hospitals have established an office supplies program that involves the posting of readily viewable "environmentally preferred" icons. In 2007, recycled content purchases reached 15.3 percent of total purchases. Other sustainable hospital purchasing programs include: • Purchasing only DEHP-free products in the Neonatal Intensive Care Unit, with planned expansion to the adult side. • Using microfiber mops designed to reduce use of water and chemicals for cleaning. • Converting to "coreless" toilet paper," reducing packaging waste by 96 percent. • Using ultra-durable floor coatings, which significantly reduce the environmental impact of traditional floor care programs. • Switching from liquid to foam-based hand soap, increasing hand washes per milliliter of product by over 33 percent. • Instituting bulk condiment dispensing and using recycled napkins in the cafeteria. • The hospitals' food service team purchases locally grown fresh produce, dairy and meat products. • In the summer of 2007, LPCH introduced a weekly "Farmer's Market," which makes shopping for fresh produce more convenient and reduces travel time needed for this task. *Sustainable Purchasing Policies – School of Medicine*. The SoM currently implements the following sustainable purchasing programs: • Purchasing energy efficient equipment. • Purchasing and using recyclable material in all food service establishments • Using microfiber mops designed to reduce use of water and chemicals for cleaning • Converting to "coreless" toilet paper, reducing packaging waste by 96 percent • Using ultra-durable floor coatings, which significantly reduce the environmental impact of traditional floor care programs • Switching from liquid to foam-based hand soap. *Purchase of Hybrid and Alternative Fuel Fleet Vehicles*. The Marguerite bus system currently provides free transit to the Stanford University community and the public. The system includes more than a dozen routes to campus locations, regional transit systems, Stanford hospitals and other destinations. All Marguerite buses run on 5 percent biodiesel, and two diesel-electric hybrid buses joined the fleet in 2009. Stanford University anticipates that all new buses will be diesel-electric hybrids and whenever possible other vehicle acquisitions will be electric or hybrids. Overall, one-third of Stanford University's 1,021 fleet vehicles are electric, 10 are hybrids, and one is an experimental solar vehicle.	Yes

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
	Transportation and Sustainable Land Use	
Offer additional public shuttles.	**Existing Emissions Reduction Program (with possible expansion):** *Operation of Free Marguerite Shuttles.* The free Marguerite shuttle system, serving the campus and surrounding community, has 39 buses, 13 routes, and 160 stops. To augment this service, Stanford has partnered with several regional transit agencies to create no-cost commute options. Stanford manages the Marguerite shuttle system to meet user demand; therefore, it would increase its shuttle service as needed to accommodate increased ridership associated with the SUMC Project. However, as publicly announced, the SUMC Project sponsors are considering enhancing SHC and LPCH transit demand programs by offering the Caltrain GO Pass to all eligible employees. The Caltrain GO Pass is an annual train pass purchased by companies for all eligible employees. Purchase of the Go Pass for hospital employees is expected to increase Caltrain use by hospital employees and, in turn, necessitate additional Marguerite Shuttle service. If double or triple usage of Caltrain occurs, the number of Marguerite Shuttles between the Palo Alto Transit Center and the SUMC will need to increase by up to three. If hospital employee use reaches the same level as for the University (quadruple usage), an additional Marguerite Shuttle would be required.	**No**
	Mitigation Measure *SHC and LPCH.* For reasons explained above, an additional Marguerite shuttle service may be needed, if circumstances warrant.	Yes
Create a program to educate and engage staff in reducing travel-related emissions.	**Existing Emissions Reduction Program:** *Education and Outreach - Alternative Transportation.* Stanford University engages on an ongoing basis in extensive internal education and marketing concerning its trip reducing programs, including monthly campus-wide email communications, advertising, electronic and mail campaigns with prize incentives, posters, banners, and road signs throughout campus, and a dedicated “transportation” section in the campus newspaper.	Yes
Allow telecommuting.	**Existing Emissions Reduction Programs:** *Employee Telecommuting – Hospitals and Clinics.* SHC and LPCH have adopted a Telecommute Policy for all departments. While telecommuting is not feasible for many hospital jobs, SHC and LPCH allow telecommuting on a case-by-case basis where job and employee characteristics lend themselves to a telecommuting arrangement. *Employee Flex Time and Telecommuting – School of Medicine.* The SoM is often able to provide flex time and telecommuting options as well as other flexible work schedule arrangements. While telecommuting is not feasible for all jobs, SoM allows telecommuting at the discretion of management based upon the nature of the work to be performed, productivity, federal and state legislation, union contracts, restrictions of funding sources, task interdependence, and other operational constraints.	Yes

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
Develop land use patterns that reduce travel-related emissions by supporting pedestrian, bicycle and transit use. Facilitate and enhance potential for mixed-use development.	**Existing Emissions Reduction Programs (with proposed expansions):** *Mixed-Use Development Pattern.* An important question in considering whether the SUMC Project would help to minimize greenhouse gas emissions is whether the project would be sited in a location that is accessible to transit facilities. A site located in a densely developed urban area near major transportation systems is more accessible than a site outside of such an area; generally, better accessibility results in shorter visitor, patient and employee trip lengths and correspondingly lower emissions. A large portion of the patients at the SHC and LPCH are from the local community; as shown in data contained in Tables 5-6 and 5-7 of the SUMC Project application, in 2006, 72 percent of the SHC outpatients and more than half of the SHC inpatients were from Santa Clara and San Mateo counties. Similarly, in 2006, 70 percent of the LPCH outpatients and nearly 70 percent of the LPCH inpatients were from these two counties. The SUMC Sites are located near the Palo Alto Intermodal Transit Center, with immediate access to pedestrian paths, bicycle paths, Marguerite Shuttle stops, and train and bus service. The SUMC Project would improve the cycling and walking facilities and pedestrian areas on the SUMC Sites by increasing connectivity, adding bicycle and pedestrian improvements, and implementing other related measures. Specific measures would be determined through the Architectural Review process. Expansion of the development at the SUMC Sites would provide additional employment opportunities within walking distance of existing residential development. The SUMC Sites are proximate to a mix of housing types along Sand Hill Road and in Menlo Park. The Welch Road Apartments are immediately adjacent to the Main SUMC Site, providing 108 one- and two-bedroom rental housing units, primarily for hospital employees. Also located at 1100 Welch Road, the Housing of Medical Emergencies (HOME) Apartments provide 42 units for out-of-town patients and their families who need temporary housing for one week or more. Directly across Sand Hill Road is the Stanford West Apartments, a complex of 628 multi-family housing units, including 107 affordable units (scheduled to increase to 132 affordable units in October 2009), completed by Stanford University between 2000 and 2002. The Stanford West Apartments provide rental priority first to Stanford faculty and staff, including SLAC National Accelerator Laboratory (SLAC) employees, second to employees of SHC and others employed on Stanford lands, and third to persons employed within the City of Palo Alto. To the west of the Stanford West Apartments are the Oak Creek Apartments, which provide 759 rental housing units. To the east of the Stanford West Apartments are 494 senior housing units, completed by Stanford beginning in 2005. The senior housing units include 388 independent living units, 38 assisted living units, 44 skilled nursing units and 24 memory support units. Additional development at the SUMC Sites would be proximate to existing services. Retail and food services are within walking distance and/or a short shuttle ride from the SUMC Sites, including establishments at the adjacent Stanford Shopping Center. In addition, the new and expanded hospital buildings proposed as part of the SUMC Project would have internal retail and cafeteria services, minimizing travel by staff and visitors to other locations to obtain these services.	Yes

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
Zone for mixed use and higher density around transit stations.	**Proposed Emissions Reduction Program:** The SUMC Project proposes a Comprehensive Plan Amendment and rezoning that would increase density near the Palo Alto Intermodal Transit Center.	Yes
Reduce parking needs for new development.	**Existing Emissions Reduction Program:** *Parking Demand Management*. Stanford University manages parking policies to encourage alternative transportation use. For example, the SUMC Project sponsors would provide preferred parking for carpools and vanpools at the SUMC Sites. As explained below, Stanford University also has various programs in place to reduce vehicle trips, and substantially reduce the need for parking.	Yes
Implement fleet optimization practices.	**Existing Emission Reduction Program:** The SHC and LPCH have instituted a tracking system that monitors data on fuel and vehicle usage, as well as trip data for the year. The hospital uses this information to determine their existing and anticipated fleet needs. Vehicle usage expenses are charged to individual departments.	Yes
Implement transit demand management (TDM) programs. Utilize employee commute incentives.	**Existing Emissions Reduction Programs (with proposed expansions):** *Alternative Transportation Programs*. The hospitals' 2006 *Commute Mode Survey*[69] indicates that 23 percent of hospital employees have primary commute modes other than a single-occupant vehicle. The 2005 *SUMC TDM Monitoring Report*[70] shows that transit ridership to the SUMC has more than doubled since 2000. These commute characteristics are a direct result of the following comprehensive set of commute mode alternative programs that the hospitals currently provide. *Commute Club (for those who do not drive alone):* • Up to $282/year in "Clean Air Cash" or Carpool Credit • Reserved parking spaces for all carpools/vanpools • Complimentary daily parking passes for carpoolers • Vanpool subsidies • Online Stanford Ridematching Service • Commuter Buddy Program • Pretax payroll deduction for transit passes, Caltrain parking, and commuter checks • Rewards for recruiting new members • Guaranteed ride home	Yes

69 Robert Eckols, Fehr & Peers Transportation Consultants, memorandum: Analysis of GO Pass Program for Hospital Employees, September 22, 2008.
70 Fehr & Peers Transportation Consultants, Stanford University Medical Center TDM Monitoring Report for October 2009 Conditions, January 2010.

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
	• 12 free hourly car rental vouchers • Membership appreciation events • Entries into regular prize drawings • Member-only commuter gifts • Ability to purchase up to eight daily parking permits per month and have them mailed to employee's home *Marguerite Shuttle:* • Free, comprehensive campus shuttle service, open to the public • Connects with local transit and Caltrain, as well as shopping and dining • Midnight Express night safety service • Automated Transportation Management System, with real-time schedules viewable on the web *EcoPass:* • Free use for hospital employees of VTA buses and light rails, Dumbarton Express, and Highway 17 Express *Line U Stanford Express:* • Free use of East Bay express bus that connects BART and ACE train to Stanford *Bicycle Programs:* • Bicycle registration • Complimentary Mid-Peninsula Bike Map, as well as city and county bike maps • Clothes and bike locker rental/shower information and maps • Safety education program • Commute planning/cycling information • Campus Bike Shop • Bike light giveaways Under the SUMC Project, these commuting incentives would be expanded by providing them to the additional employees at SHC and LPCH. At the academic campus, despite significant growth, Stanford University has met its goal of "no net new peak commute trips" every year since 2001. In 2007, 48 percent of University employees regularly used alternative transportation as their primary commute mode, and 23 percent regularly used public transportation. Overall, only 52 percent of employees drive alone to campus.	
	Green Building	
Optimize building orientation for heat gain, shading, daylighting, and natural ventilation.	**Proposed Emissions Reduction Program:** *Optimized Building Design and Landscaping*. The SUMC Project would include a number of features to achieve these goals as part of the SUMC Project design features: • The SUMC Project would utilize an existing, previously developed site, minimizing the SUMC Project footprint and the extent of construction.	Yes

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
Design of landscaping to create comfortable micro-climates and reduce heat island effects.	• The new buildings would use automatic, mechanically controlled window shading devices. These devices would allow maximal use of daylighting throughout the spaces, while preventing heat from entering into the building. They would save energy that would otherwise have been spent on artificial lighting. • The new buildings would have an optimized envelope: This includes high performance glass, exterior window overhangs, and automatic, mechanically controlled window shading devices. • The new buildings would utilize outside air with heat recovery. This would achieve savings by tempering fresh air, which, for Palo Alto's climate, is often closer to the desired air supply than air returned through a mechanical system. *Courtyards, Terraces and Green Roofs*. In addition, the site plan includes multiple courtyards to provide natural light and roof terraces, and green roofs would be provided wherever feasible.	
Design for easy pedestrian, bicycle and transit access.	**Proposed Emissions Reduction Program:** *Pedestrian, Bicycle and Transit Features*. In addition to the various transportation demand management measures listed above, as described in the SUMC Project Application at Tab 3, the SUMC Project would be designed with the following considerations in mind: • Pedestrian and bicycle improvements to Quarry Road and its intersections to enhance connections within and between the SUMC Sites, the Shopping Center Site, the Palo Alto Intermodal Transit Station, and Downtown. • Expanded Marguerite routes and service to provide optimal transit opportunities. • Relocated and/or additional Marguerite stops to optimize convenience. • Improved way-finding for all modes to minimize unnecessary circulation. • Parking distribution and management to minimize localized congestion at peak times.	Yes
Maximize on-site stormwater management through landscaping and permeable paving.	Stormwater management practices proposed under the SUMC Project are subject to the Architectural Review process. Refer to Section 3.10, Hydrology, for more detail on the SUMC Project's proposed stormwater management features.	N/A
Use sustainable building materials.	**Proposed Emissions Reduction Program:** *Sustainable Building Material Use -- Hospitals and Clinics*. As part of the SUMC Project, SHC and LPCH would use the following sustainable building materials: • Where feasible, crushed concrete from demolition would be recycled. • The new buildings would utilize renewable/recyclable materials and forego toxic products where possible, including: - Flooring - cork, linoleum, bald cypress flooring. - Paint - durable, fast curing paints with no formaldehyde, VOC content, ammonia, crystalline silica, or ethylene glycol.	Yes

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?

	- Construction adhesives, caulking compound and sealers - no-odor, non-toxic, water-based products with no formaldehyde or VOC content
	- Cabinet substrates - formaldehyde resin in binding would be avoided. Use MDF made from 100 percent recovered wood from waste
	- Insulation – formaldehyde-free fiberglass with a minimum of 25 percent recycled fiber, cotton insulation, or recycled cellulose.
	- Ceiling acoustic panels - rapidly renewable aspen fibers with nontoxic binder
	- Furniture - recyclable metal case work, compostable fabrics
	• The hospitals would use materials amenable to natural/green cleaning methods, to the extent that such methods do not compromise patient safety.
	• Grass pavers for emergency vehicle access (EVA) would be used around the base of buildings. This would allow for grasses to grow in areas where a structured drivable surface is required for EVA, and also would allow aquifer recharge.
	
	Sustainable Building Material Use -- School of Medicine. As part of the SUMC Project, the SoM would use the following materials:
	
	• Where feasible, crushed concrete from demolition would be recycled.
	• The buildings would utilize renewable/recyclable materials and forego toxic products where possible, including:
	  • Flooring- Cork, Linoleum, sheet vinyl with recycled content, carpets with recycled content.
	  • Paint-- Durable, fast curing paints with no formaldehyde, VOC content, ammonia, crystalline silica, or ethylene gycol.
	  • Construction Adhesives, Caulking Compound and Sealers-- No -odor, non-toxic.
	  • Cabinet Substrates- Avoid formaldehyde resin used in binding. Use MDF made from 100 percent recovered wood from waste.
	  • Insulation-- Formaldehyde free fiberglass minimum 25 percent recycled fiber, cotton insulation, or recycled cellulose.
	  • Ceiling Acoustic Panels-- Use high recycled content ceiling tiles and/or rapidly renewable aspen fibers with nontoxic binder.
	  • Furniture-- Use high recycle content of metal, wood and fabrics.
	• The buildings would use materials amenable to natural/green cleaning methods, to the extent that such methods do not compromise medical research.
	• Permeable asphalt and permeable concrete unit pavers would help recharge the local aquifer.	

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
Design lighting, plumbing and equipment for efficient energy and water use.	**Proposed Emissions Reduction Program:** *Green Building Features – Hospitals and Clinics*. The SHC and LPCH components of the SUMC Project would contain various features to achieve this goal: • The buildings would have a minimally engineered green roof section designed to minimize heat island effects and reduce ambient temperatures near mechanical intakes. This system minimizes roof water runoff and provides insulation for the building, thus reducing energy consumption required to heat and cool the building. • The buildings would use a Variable-Air Volume (VAV) System. VAV systems tailor the air to the needs of the space at the time. If a room is unoccupied, the amount of air will be reduced, thus reducing the amount of energy consumed. This type of system would save considerable energy compared to more conventional constant-volume systems in other hospitals. • The buildings would use occupancy controls for patient rooms. This system would link the building controls and the patient's electronic health records to automatically start the room ventilation system when a patient checks into the hospital. When the patient checks out the system reverts to an unoccupied state saving significant amounts of energy. • Displacement ventilation would be used in selected portions of the building. This system would allow smaller quantities of air to be introduced at low levels in a space at a slower velocity. Because of the smaller air quantities, this system offers savings on both the fan energy to move the air and the energy required to heat and cool the air. • Ventilation intakes would be remote. This design element would ensure the highest quality indoor air and eliminates the need for special filtration, which requires additional energy to overcome the filtration resistance. • The buildings would reduce lighting power densities (watts/square foot) through the use of (a) state of the art lighting and lamp technologies; (b) maximal use of daylighting; (c) leveraging of "borrowed light" strategies (allowing daylight to penetrate through one space to reach a space a further distance from the exterior wall or light source); (d) specialized occupancy controls; and (e) indirect lighting. Lighting technologies such as LED are changing very rapidly. Given the pace of innovation, it is reasonable to assume that the SUMC Project would be able to use less energy to power the artificial lighting system than current technologies require. • The buildings would use back-pressure steam generators in lieu of conventional pressure. The pressure reduction would capture the energy used to create the high pressure and use this energy to generate electricity. Conventional systems simply waste this energy. • The buildings would utilize occupancy sensors for lighting in strategic areas. The buildings would maximize the use of such controls, consistent with the need to maintain the highest levels of patient care. • The buildings would use EPA EnergyStar-labeled equipment where available. Examples include refrigerators, ice-makers, and computer terminals. • The buildings would use all premium efficiency motors with variable speed drives. Premium-efficiency motors consume significantly less energy than standard motors and have a longer life. The Variable Speed drives work to tailor the motor speed to the load, rather than running at a constant speed, regardless of need.	Yes

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
	• The buildings would use fanwall air delivery systems. Fanwall technology reduces the energy required to transport air. • The buildings would size air handling units to operate at maximum efficiency. Typically, air handling systems are matched to their loads. However, the fans often work more efficiently (in terms of energy required to meet particular performance) when the fans are slightly larger than the load served. The SUMC Project would seek to optimize motor sizing to take advantage of part-load efficiencies and reduce the fan energy for the building. • The buildings would link to the Stanford University cogeneration/thermal storage system for the generation of chilled water and steam. • The SHC and LPCH components of the SUMC Project would contain various water-saving features: - The buildings would use automatic sensors on faucets and urinals. These devices would ensure that people do not leave the water running when it is not necessary to do so. - Low-flow fixtures would be used throughout the facilities. The SHC and LPCH components of the SUMC Project would seek to optimize the reduced water flow requirements with operational necessities for a hospital. - Dual-flush toilets would be used, allowing the user to select a lower volume of water per flush for disposing of liquids, or a higher volume for disposing of solids. Dual-flush toilets save significant amounts of water. - The buildings would employ minimal use of water-cooled equipment such as ice-makers and when such equipment is used, it would be water-efficient. - The buildings would not use once-through water-cooled equipment, such as sterilizers and imaging equipment, that use potable water once and discharge it to the drain. - Anti-microbial hand-rinse pumps and water efficient sterilizers with water recirculation and automatic shut-off would be used to reduce the need for hand washing. - Where possible, the buildings would use EPA-labeled WaterSense fixtures. These devices use low amounts of water compared to conventional equipment. - Minimizing the use of water for landscaping has been and would continue to be an overarching design principle of the SHC and LPCH components of the SUMC Project, and the hospitals would not increase water use for landscaping. - The landscaping would be designed to make maximum use of drought-tolerant, native planting to minimize the water consumed in irrigation. - In accordance with existing practice, landscape irrigation would be continually adjusted to match the season's progress. Watering would be reduced as the weather cools and would be turned off as soon as the rains begin. - The hospitals' grounds team would use mulching lawn mowers that recycle grass clippings into the lawns. This helps the soil to retain moisture, which would reduce the need for irrigation water. - The grounds team also would make extensive use of bark mulch (generated by Stanford University tree pruning and provided to SUMC free of charge) to mulch the grounds, which would further help the soil to retain moisture and reduce the need for irrigation water.	

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
	- Hospitals are required to provide empty tanks for storage of wastewater during an earthquake. The buildings would use these tanks to store rainwater in the interim, and would use the rainwater to serve the limited landscape irrigation needs for the SUMC Project. *Green Building Features – School of Medicine*. The new SoM buildings would meet Stanford University's 2008 *Building Performance Guidelines* that target energy efficiency in new buildings of 30 percent below California Title 24/ASHRAE 90.1 (2004) and water efficiency 25 percent below similar existing campus buildings. The SoM components of the SUMC Project would contain various features that would achieve this goal: • The buildings would use a Variable-Air Volume (VAV) System with Heat recovery. • Displacement ventilation and/or demand-controlled ventilation would be used in some conference rooms to reduce energy usage. • Ventilation intakes would be sized for low-velocity pressure drops, to reduce energy use. • The buildings would reduce lighting power densities (watts/square foot) through the use of (a) state of the art lighting and lamp technologies; (b) maximal use of daylighting; (c) leveraging of "borrowed light" strategies (allowing daylight to penetrate through one space to reach a space a further distance from the exterior wall or light source); (d) specialized occupancy controls; and (e) indirect lighting. Lighting technologies such as LED are changing very rapidly. Given the pace of innovation, it is reasonable to assume that the SUMC Project would be able to use less energy to power the artificial lighting system than current technologies require. Finally, the buildings would (f) lower lighting levels by separating ambient lighting and task lighting. • The buildings would utilize occupancy sensors for lighting in all lab and office areas. • The buildings would use EPA EnergyStar-labeled equipment where available. Examples include refrigerators, ice-makers, and computer terminals. • The building HVAC system would use all premium efficiency motors with variable speed drives. Premium-efficiency motors consume significantly less energy than standard motors and have a longer life. The Variable Speed drives work to tailor the motor speed to the load, rather than running at a constant speed, regardless of need. • The building HVAC system will use fanwall air delivery systems. Fanwall technology reduces the energy required to transport air. • The buildings would size air handling units to operate at maximum efficiency and "right sizing". Typically, air handling systems are matched to their loads. However, the fans often work more efficiently (in terms of energy required to meet particular performance) when the fans are slightly larger than the load served. The SUMC Project would seek to optimize motor sizing to take advantage of part-load efficiencies and reduce the fan energy for the building. • The buildings would link to the Stanford University cogeneration/thermal storage system for the generation of chilled water and steam. With respect to the use of water, the SoM component of the SUMC Project would target water use reduction by 25 percent.	

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
	• The buildings would use automatic sensors on faucets and urinals throughout the SoM buildings. These devices would ensure that people do not leave the water running when it is not necessary to do so. • Low-flow fixtures would be used throughout the facilities. • Dual-flush toilets or recycled water would be used for toilets and urinals. • The buildings would employ minimal use of water-cooled equipment such as ice-makers and when such equipment is used, it would be water-efficient. • The buildings would not use once-through water-cooled equipment, such as sterilizers, vacuum pumps and imaging equipment, that use potable water once and discharge it to the drain. • Anti-microbial hand-rinse pumps and water efficient sterilizers with water recirculation and automatic shut-off would be used to reduce the need for hand washing. • Use of water for landscaping would be minimized. • The landscaping would be designed to make maximum use of drought-tolerant, native planting to minimize the water consumed in irrigation. • In accordance with existing practice, landscape irrigation would be continually adjusted to match the season's progress. Watering would be reduced as the weather cools and would be turned off as soon as the rains begin. • The grounds team would use mulching lawn mowers that recycle grass clippings into the lawns. This helps the soil to retain moisture, which reduces the need for irrigation water. • The grounds team also would make extensive use of bark mulch (generated by Stanford University tree pruning and provided to SUMC free of charge) to mulch the grounds, which further helps the soil to retain moisture and reduce the need for irrigation water.	
Use creativity and innovation to build more sustainable environments.	Implementation of emissions reduction measures is challenging in a hospital setting, where strict requirements for sterilization, air flow, and infection control limit some of the measures that might otherwise be available. Such challenges require creative and innovative solutions. The SoM is part of Stanford University, which has been at the forefront of sustainability issues for many years. As a result of its extensive efforts in sustainability, Stanford has scored in the top tier of the most recognized nationwide study of sustainability practices on college campuses. Only 15 of the 300 colleges and universities studied—Stanford among them—earned the title "overall college sustainability leader" in the 2008 College Sustainability Report Card. The report is released annually by the Sustainable Endowments Institute in Cambridge, MA. **Existing Emissions Reduction Program:** *Partnerships with Vendors to Reduce Packaging*. Through a partnership with Owens & Minor, the hospitals' primary supplier of medical supplies, over 90 percent of the supplies used for the medical center currently are ordered online and delivered to the patient care units in plastic, reusable totes. Both the pallets and reusable totes are returned to Owens & Minor each day for reuse. Owens & Minor provides these unique support services, considered the Gold Standard in the healthcare industry, to only two other medical facilities in the Bay Area.	Yes

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
	Proposed Emissions Reduction Program: *Waste Anesthetic Capture*. As part of the SUMC Project, the SHC and LPCH buildings would utilize a dedicated piping system for capturing waste anesthetic. Currently, these chemicals are unregulated, and hospitals simply exhaust them to the atmosphere. These chemicals have up to 4,000 times the global warming impact as CO_2 and are estimated to be approximately 10 percent of the total greenhouse gas impact from the hospitals.[71] The Stanford hospitals would be the first hospitals in the United States to install a system to sequester these gases so they can be cleansed and reused rather than exhausted.	
	Zero Waste	
Expand implementation of Zero Waste programs.	The SUMC Project includes a number of waste reduction programs described throughout this table. However, an audit would be necessary to verify compliance with the City's Climate Protection Plan Policies	**No**
	Mitigation Measure *Preparation of a Waste Reduction Audit*. The SUMC Project sponsors shall perform a waste reduction audit of waste management practices at the hospitals prior to construction of new facilities and after completion of the SUMC Project to determine post-project diversions. This audit shall be repeated annually, and with the results being made available to the public or to City of Palo Alto staff.	Yes
Reduce the amount and toxicity of consumer product waste. Encourage innovative reuse and recycling services to be added by the private sector and nonprofit groups, so the City does not have to invest in	**Existing Emissions Reduction Programs:** *Toxic and Chemical Waste Reduction Programs*. The hospitals have programs in place to reduce the amount and toxicity of waste: • The hospitals have made it a policy to come as close as possible to mercury-free. In the process, the hospitals have eliminated a significant amount of waste: – In 2001, the hospitals implemented a fluorescent lamp recycling program. In fiscal year 2007, 8.8 tons (17,643 pounds) were recycled as a result of the program. – In 2001, the hospitals implemented a battery collection program. There are over 35 designated "Battery Recycling" collection locations throughout the medical center. In fiscal year 2007, 8.0 tons (15,938 pounds) of batteries were recycled. • The hospitals began an E-waste recycling program in 2002. In fiscal year 2007, the hospitals recycled 7.3 tons through Zak Enterprises, one of the original 15 recyclers in the U.S. to endorse "The Recyclers Pledge of True	

71 The referenced anesthetic gases are isoflurane, desflurane, and sevoflurane. Although the Intergovernmental Panel on Climate Change (IPCC) has identified them as greenhouse gases, they are not one of the six Kyoto gases and thus are not regulated by AB 32. Nitrous oxide (N_2O) is a weak general anesthetic and is more commonly used as a carrier gas in modern anesthesia delivery. The dedicated piping system for capturing anesthetic gases would not reclaim N_2O per the currently available technologies, however would capture isoflurane, desflurane, and sevoflurane.

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
those activities.	Stewardship" as drafted by B.A.N., an international organization focused on halting the export of toxic materials. • The Surgical Pathology department has treated Formalin (a fixative) waste with NeutraLex® for over seven years. This instrumentation and automation upgrade uses fewer chemicals and produces less chemical waste. • Stanford has a "Surplus Chemical Program" exchange that gives researchers a direct means of improving the environment by reducing the volume of chemicals purchased and disposed of as waste. • All of the cardboard generated from the hospitals' primary supplier of medical supplies is recycled by the supplier. • The hospitals return all toner and inkjet cartridges to the supplier for recycling. *Recycling and Composting Programs*. Campus-wide, Stanford University is engaged in numerous recycling and composting initiatives. The SHC, LPCH and SoM participate in the following programs: • Paper, cardboard, cans, glass, and plastics are all collected in recycling bins on the Stanford University campus. The SoM recycles paper, cans, glass, plastic, batteries, and printer cartridges. • A lab glass recycling program recently has been started. • Food waste is composted, which reduces waste and the use of water for garbage disposals. • Stanford University mulches brush and tree trimmings for use on campus, composts yard waste from residences and other buildings, and leaves mowing trimmings behind to replenish nutrients in lawn areas. • Building materials, dirt, and other debris from construction and demolition are recycled and reused whenever possible. • Compostable service ware is provided at events. • Electronic equipment is resold or recycled. • Batteries are collected and recycled. • Cell phones, PDAs, chargers, CDs, and other small electronics are collected from academic buildings and residences. In 2007, Stanford University recycled, reused or composted: • 5,855 tons of organic material • 829 tons of glass, metal and plastic • 3,095 tons of paper • 236 tons of electronic waste • 3,171 tons of construction and demolition debris **Proposed Emissions Reduction Programs:** *Construction Waste Recycling -- Hospitals and Clinics*. As part of the SUMC Project, SHC and LPCH would achieve a minimum of 75 percent recycling of construction and demolition waste, up to a goal of a 90 percent diversion rate.	

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
	Recycling in Public Areas: The SUMC Project would enhance waste reduction through proper attention to convenient location for recycling centers and bins. The buildings would also provide facilities to enable organic waste treatment and/or removal for composting.	
Expand collaborative efforts with targeted businesses to reduce use of disposable items.	**Existing Emissions Reduction Programs:** *Reuse of Disposable Items – Hospitals and Clinics*. The SHC and LPCH have implemented a number of measures designed to reduce the use of disposable items: • In 2005, the hospitals implemented a program for reusable sharps and pharmaceutical waste containers. The hospitals have over 2,100 such containers that are checked and changed by staff. • The Ambulatory Surgery Center utilizes the Neptune® by Stryker® fluid management system to reduce suction canister use. • The hospitals collect compression sleeves for reprocessing by Ascent® Corporation. The program began in 2005 and has diverted over 7 tons of waste from landfills. Currently, Surgical Services is evaluating two other products by Ascent® that would increase diversions. • The hospitals collect five pulse-oximeter probe products which are delivered to Nelcor® for reprocessing. The program began in 2003, with 6,119 total qualifying sensors collected from 38 collection locations. *Reuse of Disposable Items- School of Medicine*. The SoM has implemented a number of measures designed to reduce the use of disposable items: • Stanford University's Re-Use website facilitates the sharing of equipment, furniture, and supplies between departments. The hospitals are engaged in similar and related efforts: - Staff can go on-line to view available furniture, complete a request form, and have it delivered. - A long-term partnership with a local upholsterer allows furniture in good condition to be refreshed in new color schemes at minimal cost. The Facilities Management team steam cleans office cubicle fabrics or installs new fabric rather than purchasing new office cubicles.	Yes
Enhance waste reduction programs.	**Existing Emissions Reduction Programs:** *Source Reduction Programs – Hospitals and Clinics*. Many of the measures listed above have resulted, and are expected to continue to result, in a reduction in the amount of landfilled solid waste. Recycling, composting and reuse are important programs for addressing wastes that cannot be avoided. However, SHC and LPCH also have a number of programs that minimize the generation of new wastes (referred to as source reduction). • In the fall of 2007, the hospitals installed a "shrink wrap" recycling program on the loading dock. Seven, 96-gallon containers are now removed daily of shrink wrap and plastic film. • The hospitals' housekeeping department has instituted numerous initiatives to reduce waste: - In 2005, housekeeping instituted a microfiber mop program, with an annual water savings of 13,140 gallons, and 657 gallons of chemical avoidance. Through 2007, 52,560 gallons of water have been saved and chemical use has been reduced by 2,628 gallons. - Also in 2005, the hospitals installed automatic, EnMotion paper towel dispensers, reducing the amount of	Yes

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
	paper towel consumption by 30 percent. - The hospitals have converted to "coreless" toilet paper, reducing packaging waste by 96 percent and virtually eliminating roll-core waste. - The paper towels and toilet paper products described above, purchased through Georgia-Pacific, contain recycled fiber content that meets or exceeds US EPA recommended guidelines. - Housekeeping has begun applying GlossTech, an ultra-durable floor coating that significantly reduces the environmental impact of traditional floorcare programs. - In 2007, the hospitals switched from a liquid handsoap to a foam-based product, increasing handwashes per milliter of product by over 33 percent, with an associated reduction in waste. • The hospitals' cafeteria has also undertaken numerous efforts to reduce waste: - In July of 2007, the cafeteria teams instituted bulk condiment dispensing and eliminated small packets in high-volume service areas. - In the same month, the cafeteria introduced 100 percent post-consumer recycled content napkins, dispensed in a "napkin tree," which has reduced the number of napkins purchased by over 50 percent. - The cafeteria also posted a reminder at the entrances to "please use a reusable tray," which reduced the number of disposable tray cases purchased by 19, in just two weeks. Disposable trays are made from recycled paper. • The hospitals have engaged in a significant effort to reduce paper usage by utilizing electronic documents: - LPCH initiated "Electronic Medical Records" (EMR) in 2006 and SHC adopted "Electronic Medical Dictation" (EMD) in the same year. The final stage for SHC transition to full EMR was completed in April of 2008. - In 2006, the hospitals began putting numerous forms, manuals, and documents online. In early 2008, several initiatives began to reduce paper-use considerably through introduction of Share-Point, a document management guide for teams and groups. Two departments completing an analysis of work-flow decided to eliminate certain reports and will save 30,200 pages per year as a result. Several monthly reports will be put online, two of which will eliminate 56,000 printed pages a year.	
Encourage green building and adaptive reuse.	Please refer to the discussion under the Green Building header and the discussion of reductions in the use of disposable items for information regarding the SUMC Project's green building features. **Proposed Emissions Reduction Program:** *Adaptive Modular Building Plan.* As part of the SUMC Project, the hospitals would include a modular planning concept so as to make future building re-use much easier as compared to previous designs, which required much more extensive renovations and associated resource consumption.	Yes

Table 3.6-5
Comparison of SUMC Project Emissions Reduction Program to Climate Protection Plan Policies

Action/Goal	SUMC Measure	Compliant with Climate Protection Plan Policies?
Improve recycling in public areas.	**Proposed Emissions Reduction Program:** *Improved Visibility of Recycling Facilities*. The hospitals' and SoM buildings would enhance waste reduction through proper attention to convenient locations for recycling centers and bins. The buildings would also provide additional composting facilities.	Yes
Education and Motivation		
Increase employees' awareness of climate protection issues. Continue education and monitoring efforts. Integrate climate protection into events and operations. Complete integration of climate protection into all operations.	**Existing Emissions Reduction Programs:** *SUMC Sustainability Campaign*. Representatives from the hospitals have initiated a SUMC Sustainability Campaign to provide education, and to encourage sustainability practices. In addition, a newly formed Green Team made up of SoM, SHC and LPCH representatives communicates regularly with hospital employees through its website: http://med.stanford.edu/ sustainability/. *Stanford University Sustainability Education and Outreach*. Stanford University conducts extensive outreach efforts concerning its environmental programs, including campus-wide emails, advertising, electronic and mail campaigns with prize incentives and other actions. As part of these efforts, Stanford University maintains a website (http://sustainablestanford.stanford.edu/) that provides information on the actions being undertaken by Stanford, what actions staff, faculty and students can take, teaching and research programs (including Stanford's Initiative on the Environment and Sustainability), and relevant news and resources.	Yes

Source: Based on data provided by Catherine Palter, Associate Director, Stanford University Land Use and Environmental Planning to PBS&J, 2009.

Although the SUMC Project inventory indicates that the SUMC Project would result in a net increase in greenhouse gas emissions, the proposed Emissions Reduction Program would reduce net greenhouse gas emissions. The center column of Table 3.6-5 describes the proposed Emissions Reduction Program's specific design features that correspond with each of the goals and actions. The table identifies existing design features, those that are currently being implemented and are anticipated to continue to minimize greenhouse gas emissions throughout the life of the SUMC Project; and proposed new features, those whose features would reduce the emissions-projections accounted for earlier in this subsection in the SUMC Project inventory. If the SUMC Project fails to comply with the Climate Protection Plan policies after implementation of the proposed Emissions Reduction Program, Table 3.6-5 identifies mitigation that would help to bring the SUMC Project into compliance.

Quantification of Emissions with Proposed Emissions Reduction Program. This section employs a quantitative analysis of the proposed Emissions Reduction Program in order to assess whether the SUMC Project complies with the City's long term numeric reduction goals in its Climate Protection Plan. As discussed above, to account for full project build out, this analysis uses the 30 percent BAU emissions target reduction for 2020 as the criteria for assessing compliance with the goals of the Climate Protection Plan. As the proposed Emissions Reduction Program's design features by itself would not reach the emission reduction goals of the Climate Protection Plan, additional mitigation measures are suggested and evaluated here.

As shown in Table 3.6-5, the SUMC Project sponsors propose to invest in a number of green building design features that would increase the efficiency of energy and water use when compared to the use of these resources by existing structures. These features are not required under existing State or local regulations, but would be adopted voluntarily. On a per-square-foot basis, the replacement structures proposed under the SUMC Project would be expected to have a lower carbon footprint (i.e., lesser greenhouse gas emissions). Due to modeling limitations,[72] most of the emissions reductions associated with new design features could not be accurately quantified and accounted for in the SUMC Project inventory. For example, it is not clear how much waste the hospitals' zero waste policies would divert from landfills or how much water and energy would be saved as a result of specified practices. The emissions reductions associated with these proposed sustainability programs could vary greatly depending on the details of the design features' implementation. Moreover, emissions reduction design features tend to have a certain amount of overlap; for example, if two energy efficiency design features that result in 10 percent reductions each (if implemented in isolation of each other) were combined, the resulting emissions reduction would not necessarily equal 20 percent.

[72] To date, the existing literature does not provide a consistent, reliable estimate of the emissions reductions that are achievable through various design features. For each design feature, reported reductions may range dramatically. In addition, the details of the SUMC Project's energy, water, landscaping, and waste management systems have not been finalized, and the extent of the emissions reductions that would be achieved would depend on the details of these systems.

Therefore, not all of the proposed design features were quantified in this analysis. Table 3.6-6 provides the estimated reduction in emission with the proposed Emissions Reduction Program, and also provides for comparison the SUMC Project emission without the proposed Emissions Reduction Program. As shown, with the proposed Emissions Reduction Program, the greenhouse gas emission would be reduced from 74,803 MT CO_2e to approximately 70,355 MT CO_2e.

Table 3.6-6
SUMC Project Greenhouse Gas Emissions, With and Without Proposed Emissions Reduction Program

	With Proposed Emissions Reduction Program		Without Proposed Emissions Reduction Program	
Source of Emissions	**Units Consumed**	**Net Emissions (MT CO_2e)**	**Units Consumed**	**Net Emissions (MT CO_2e)**
Natural Gas (therms)	4,110	22	5,137	27
Diesel Generators (gallons)	2,232	23	2,232	23
Medical Nitrous Oxide (cubic feet)	6,127	99	6,127	99
Fleet Vehicle Fuels (gallons)	13,845	100	13,845	100
Helicopter Fuel (gallons)	21,083	201	21,083	201
Electricity (MWh) [a]	54,640	8,632	54,630	12,914
Steam and Chilled Water (MBtu)	10,995	19,542	10,995	19,542
Non-fleet Vehicular Emissions (VMT)[b]	275,566	41,257	275,566	41,257
Solid Waste (tons)[c]	1,792	480	1,792	640
Total Emissions		**70,355**		**74,803**

Source: Emissions provided by Mazetti & Associates and adjusted by PBS&J, 2010 (Appendix H) and reductions provided by PBS&J and AECOM, 2010 (Appendix G).

Notes:

a. The Mazzetti and Associates inventory used an electricity emission factor of 263.62 lbs CO_2/megawatt hour (MWh) provided by CPAU. The City has indicated that this emissions factor does not apply to the development on the SUMC Sites and requested that the inventory be revised using CO_2 emissions factor of 499.32 lbs CO_2/MWh based on the City's energy purchasing records; and CCAR's standard emissions factors for N_2O and CH_4 (0.0037 lbs N_2O/MWh and 0.0067 lbs CH_4/MWh). The electricity emissions in this table represent the use of the revised emission factors with the incorporation of the appropriate reductions.

b. Calculated using VMT assumptions reported in AECOM Transportation, February, 2010. Emissions were modeled using the VMT assumptions from AECOM in the URBEMIS 2007 software. The numbers vary slightly from the VMT in the AECOM memo due to rounding purposes for the URBEMIS model. AECOM Transportation, February 11, 2010 Memorandum to Trixie Martelino, Revised VMT Calculations for SUMC Project.

c. SUMC solid waste emissions were determined based on total City wide emissions. Existing SUMC solid waste generation is 5 percent of City wide waste generation therefore emissions attributed to SUMC generation was determined to be 5 percent of total City wide waste emissions.

Generally, the proposed Emissions Reduction Program would result in the following reductions in greenhouse gas emissions:

- The design of all non SoM buildings have an energy efficiency rating that is at least 20 percent greater than current Title 24 requirements, which would reduce electricity and natural gas demand by 20 percent;

- The design of the SoM buildings have an energy efficiency rating that is at least 30 percent greater than current Title 24–energy efficiency requirements, which would reduce electricity demand by 30 percent. Note that natural gas consumed within the SoM buildings is from consumption by the boilers/steam plant and would not be affected by the energy efficiency of the building, but rather by the efficiency of the boiler/steam plant. Therefore, boiler/steam plant natural gas consumption would not be reduced based upon the energy rating of the building.

Business as Usual Emissions and Comparison. BAU accounts for emissions from the SUMC Project, if the SUMC Project only complied with the minimum regulatory requirements for energy efficiency and vehicle trip reduction taking into account the current conditions on the ground. Therefore, BAU would include current Title 24 energy efficiency standards, the current water supply system, and the current transit opportunities in to and from the SUMC Sites, but would not take into account SUMC Project design features that increase energy efficiency beyond Title 24 standards, SUMC Project improvements to transit, or other design features that reduce emissions. The BAU becomes a prediction of emissions that would occur without considering greenhouse gas emissions reduction capabilities that could be incorporated into the SUMC Project. The AB 32 Scoping Plan estimated that greenhouse gas emissions need to be reduced by approximately 30 percent below BAU conditions by year 2020 in order to achieve the State Reduction Target (reduce greenhouse gas emissions down to 1990 emission levels by year 2020). Therefore, comparing the SUMC Project to BAU and determining if the SUMC Project can achieve the estimated reduction shown in the AB 32 Scoping Plan (emissions 30 percent below BAU estimates) is one way of measuring the potential impact of SUMC Project generated greenhouse gas emissions. As shown in Table 3.6-7, with the proposed Emissions Reduction Program, the SUMC Project would have 5.95 percent less emissions than the BAU scenario. As discussed above, this analysis uses the 30 percent BAU emissions target reduction for 2020 as the criteria for assessing compliance with the goals of the Climate Protection Plan. Without the implementation of additional mitigation measures, the SUMC Project would be more than 24 percent short of meeting this reduction goal.

Table 3.6-7
Comparison of SUMC Project Greenhouse Emissions with Business As Usual Emissions

	MT CO_2e	
Net Emissions	**Net 2025 BAU**	**SUMC Project Emissions with Proposed Emissions Reduction Program**
Total Emissions	*74,802*	*70,355*
% reduction from BAU	-	5.95
AB 32 BAU Reduction %	-	30
Significant?		Yes

Source: PBS&J, 2010 (Appendix H).

Summary. As shown in Table 3.6-7, the proposed Emissions Reduction Program alone would be insufficient for the SUMC Project to further the goals and policies established in the City's Climate Protection Plan. Additionally, without additional mitigation measures, the SUMC Project with its proposed Emissions Reduction Program would reduce emissions compared to the BAU scenario by 5.95 percent, substantially less than the 30 percent reduction per CARB's *Climate Change Scoping Plan*. As such, without additional mitigation measures, the SUMC Project would have a cumulatively considerable contribution to cumulative greenhouse gas emissions, and would not be sufficient to further the goals of the City's Climate Protection Plan.

MITIGATION MEASURES. The following discussion addresses additional feasible mitigation measures that could be implemented by the SUMC Project in order to further reduce impacts related to greenhouse gas emissions. For example, non-fleet vehicular emissions represent over half of the total emissions associated with the SUMC Project,[73] and programs proposed by the SUMC Project sponsors do not employ all feasible strategies for reducing such emissions. Moreover, the SHC, LPCH, and SoM do not participate in the City's Palo Alto Green renewable energy program or share emissions inventories with City departments. The City has identified mitigation measures, which in addition to the proposed Emissions Reduction Program, would further minimize the increase in greenhouse gas emissions from this project. Without these additional measures, impacts are considered to be significant, due to the SUMC Project's interference with the City's attempt to achieve the overall goals set forth in the City's Climate Protection Plan.

Mitigation Measure TR-2.3 in Section 3.4, Transportation, would require the SUMC Project sponsors to expand the current TDM program by offering, among other options, the Caltrain GO Pass, or equivalent TDM Measure, to all eligible SUMC employees. The Caltrain GO Pass is an annual train pass purchased by companies for all eligible employees. Purchase of the GO Pass for hospital employees is expected to increase Caltrain use by hospital employees and, in turn, necessitate additional Marguerite Shuttle service. Based on information from 2006 provided by Parking & Transportation Services, approximately 90 percent of SHC replacement hospital employees would be considered eligible employees for the GO Pass program. Inclusion of the Caltrain GO Pass program, or equivalent TDM Measure, is anticipated to reduce non-fleet vehicle emissions by about 13.5 percent.

In addition, to further reduce impacts related to greenhouse gas emissions, the City shall consider the feasibility of Mitigation Measure PH-3.1, as identified and discussed in further detail in Section 3.13, Population and Housing.

The Climate Protection Plan, in addition to setting goals and actions, requires that the City conduct monitoring activities to ensure that greenhouse gas reductions strategies have been successful. Mitigation Measures CC-1.1, CC-1.2, and CC-1.3, below, would serve a similar

[73] According to the conservative assumptions used to prepare the inventory; see discussion of these assumptions on page 3.6-29.

purpose as the City's municipal monitoring program in ensuring that the emission reduction features proposed under the SUMC Project and the continuation of existing programs would further the City's Climate Protection Plan goals.

Finally, because the SHC and LPCH account for a large percentage of future CPAU energy demand, hospitals' participation in the City's renewable energy program, Palo Alto Green, an equivalent renewable program, or combination thereof, must be required to make the determination that the SUMC Project would be consistent with the energy policies of the Climate Protection Plan. Participation in Palo Alto Green is expected to result in an approximately 17 percent reduction from BAU and an approximately 12 percent reduction from emissions with the proposed Emissions Reduction Program.[74] Inclusion in the Palo Alto Green program is identified as Mitigation Measure CC-1.2.[75]

CC-1.1 *Commission and Retro-Commission Energy Systems for New and Existing Buildings*. New construction and existing buildings altered by construction of the SUMC Project shall undergo commissioning[76] of energy and HVAC systems during construction and on an annual basis during the first five years of operation. The commissioning process shall follow the standards of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Guideline 0-2005 or the International Performance Measurement and Verification Protocol (MVP). This process would ensure that new and existing energy systems would perform interactively according to construction documents, the SUMC Project design intent and the owner's operational needs.

74 The approximately 17 percent reduction from BAU was determined by the following equation: (74,803 – 61,889)/74,803. Where 74,803 is equal to the total annual BAU emissions (in MT CO_2e), and 61,889 is equally to the annual BAU emissions (in MT CO_2e) minus the 12,914 MT CO_2e from electrical usage offset by the mitigation measure. Similarly, the approximately 12 percent reduction from emissions with the incorporation of design features was determined by (70,335 – 61,723)/70,335. Where 70,335 is the total annual emissions in MT CO_2e after incorporation of the project design features and 61,723 is the total annual emissions in MT CO_2e minus the 8,632 MT CO_2e from electrical usage that is offset by the mitigation measure. Note that the emissions offset with design features incorporated is less because the design features reduce the amount of emissions emitted per MWh used.

75 Per Karl Van Orsdol, Energy Risk Manager, City of Palo Alto. Personal communication with Randi Adair, PBS&J, January 20, 2009.

76 According to the U.S. Department of Energy: "Building commissioning is a systematic process of ensuring that a building performs in accordance with the design intent, contract documents, and the owner's operational needs. Due to the sophistication of building designs and the complexity of building systems constructed today, commissioning is necessary, but not automatically included as part of the typical design and construction process. Commissioning is critical for ensuring that the design developed through the whole-building design process is successfully constructed and operated." Commissioning includes the following activities: 1) Systematically evaluating all pieces of equipment to ensure that they are working according to specifications. This includes measuring temperatures and flow rates from all HVAC devices and calibrating all sensors to a known standard. 2) Reviewing the sequence of operations to verify that the controls are providing the correct interaction between equipment. Additional information is available at: http://www1.eere.energy.gov/ buildings/ commercial/commissioning.html

CC-1.2 *Participate in Palo Alto Green Energy Program, Other Equivalent Renewable Energy Program, or combination thereof.* Under the Palo Alto Green program, residential, business and industrial customers purchase renewable energy equivalent to their electricity needs at an additional cost of 1.5 cents per kWh above standard electric rates. The SHC and LPCH facilities shall participate in this program to offset electricity emissions; develop new renewable generation sources in collaboration with the CPAU; incorporate a renewable energy source (such as photovoltaics) into the SUMC Project, or a combination thereof, such that a minimum of 54,640 MWh of electricity usage is offset annually.

CC-1.3 *Provide Annual Greenhouse Gas Reporting*. The SHC and LPCH shall perform an annual inventory of greenhouse gas emissions associated with hospital and medical facilities on the SUMC Sites. This inventory shall be performed according to a common industry-standard emissions reporting protocol, such as the approaches recommended by California Air Resources Board, The Climate Action Registry, or Business Council for Sustainable Development (BCSD). This inventory shall be shared with the City of Palo Alto to facilitate the development of future collaborative Emissions Reduction Programs. Emissions associated with energy, water, solid waste, transportation, employee commute and other major sources shall be reported in this inventory.

CC-1.4 *Prepare Waste Reduction Audit*. The SUMC Project sponsors shall perform a waste reduction audit of waste management practices at the hospitals prior to construction of new facilities and after completion of the SUMC Project to determine post-project diversions. This audit shall be repeated annually, and with the results being made available to the public or to City of Palo Alto staff.

Post-Mitigation Quantification. Table 3.6-8 shows the anticipated reduction from the incorporation of the above mitigation measures in addition to the proposed Emissions Reduction Program. As shown in Table 3.6-8, the above mitigation measures would reduce the SUMC Project's greenhouse gas emissions from 70,355 MT CO_2e to 56,190 MT CO_2e.

With the above mitigation measures, greenhouse gas emissions would be 56,190 MT per year, an approximately 7 percent increase in emissions from the 2005 baseline for the community of Palo Alto of greenhouse gases. When the City Council established reduction goals for the City and community, it set as its goal a 15 percent decrease in 2005 baseline emissions by 2020, or a reduction in emissions of approximately 119,000 MT. With mitigation, the SUMC Project would still contravene the City's and the community's ability to meet the City Council goals in greenhouse gas reductions as it would require the City to reduce greenhouse gas emissions by 219,905 MT per year in 2025 through other actions. This reduction would constitute a 25.9 percent reduction in greenhouse gas emissions from the 2005 baseline estimates in the year 2025.

Table 3.6-8
Net Mitigated SUMC Project Greenhouse Gas Emissions

Source of Emissions	SUMC Project with Proposed Emissions Reduction Program		SUMC Project with Proposed Emissions Reduction Program + Mitigation Measures	
	Units Consumed	Net Emissions (MT CO_2e)	Units Consumed	Net Emissions (MT CO_2e)
Natural Gas (therms)	4,110	22	4,110	22
Diesel Generators (gallons)	2,232	23	2,232	23
Medical Nitrous Oxide (cubic feet)	6,127	99	6,127	99
Fleet Vehicle Fuels (gallons)	13,845	100	13,845	100
Helicopter Fuel (gallons)	21,083	201	21,083	201
Electricity (MWh) [a]	54,640	8,632	54,640	0
Steam and Chilled Water (MBtu)	10,995	19,542	10,995	19,542
Non-fleet Vehicular Emissions (VMT)[b]	275,566	41,257	238,355	35,724
Solid Waste (tons)[c]	1,792	480	1792	480
Total Emissions		**70,355**		**56,190**

Source: Reductions provided by PBS&J, 2010 (Appendix H), and AECOM 2010 (Appendix G).

Notes:

a. The Mazzetti and Associates inventory used an electricity emission factor of 263.62 lbs CO_2/MWh provided by CPAU. The City has indicated that this emissions factor does not apply to the development on the SUMC Sites and requested that the inventory be revised using CO_2 emissions factor of 499.32 lbs CO_2/MWh based on the City's energy purchasing records; and CCAR's standard emissions factors for N_2O and CH_4 (0.0037 lbs N_2O/MWh and 0.0067 lbs CH_4/MWh). The electricity emissions in this table represent the use of the revised emission factors with the incorporation of the appropriate reductions.

b. Calculated using VMT assumptions reported by AECOM Transportation, February 11, 2010 Memorandum to Trixie Martelino, Revised VMT Calculations for SUMC Project. Emissions were modeled using the VMT assumptions from AECOM in the URBEMIS 2007 software. The numbers vary slightly from the VMT in the AECOM memo due to rounding purposes for the URBEMIS model.

c. SUMC solid waste emissions were determined based on total citywide emissions. Existing SUMC solid waste generation is 5 percent of citywide waste generation therefore emissions attributed to SUMC generation was determined to be 5 percent of total citywide waste emissions.

The additional 54,640 MWh of load requires the City to purchase an additional 18,213 MWh of renewable power to meet State requirements. The City is required to make this expenditure, without which the City would not be able to meet its renewable portfolio standards. State laws are currently being proposed which would impose considerable fines should the City not meet the goal. The City would need to purchase additional renewable power to meet the City Council mandated renewable portfolio standard of 33 percent by 2012 and beyond. Renewable energy resource development is lagging behind regulatory-driven demand, and the City would find it increasingly difficult to locate renewable power sources to cover the additional requirements. Therefore, it may not be feasible to achieve the reduction in emissions from electricity usage shown in Table 3.6-9.

Table 3.6-9
Annual SUMC Project Greenhouse Gas Emissions Reduction from Business as Usual Emissions, with Mitigation

	MT CO_2e		
Net Emissions	**Net 2025 BAU**	**Net 2025 Project Design**	**Net 2025 Project Design + Mitigation**
Total Emissions	74,802	70,355	56,189
% reduction from BAU	-	5.95	24.88
AB 32 BAU reduction %	-	30	30
City Target BAU Reduction %	-	**30**	**30**
Significant?	-	**Yes**	**Yes**

Source: PBS&J, 2010 (Appendix H).

As shown in Table 3.6-8, over half of the SUMC Project's emissions come from "non-fleet vehicular emissions," which are emissions from VMT. Of these trips, an estimated 40 percent are from employee trips and 60 percent are from patient trips. An analysis of potential measures to reduce VMT is included in Section 3.4, Transportation, particularly under the discussion of Impact TR-2, and in Section 3.5, Air Quality, particularly under the discussion of Impact AQ-2. As discussed in those sections, implementation of Mitigation Measure TR-2.3 is expected to reduce VMT by 13.5 percent, and that reduction is reflected in Table 3.6-9. In addition, the discussion of Impact PH-3 in Section 3.13, Population and Housing, includes additional potential mitigation measures that could further reduce VMT by improving the City's Jobs to Employed Residents Ratio. The City will need to consider the feasibility of implementing some or all of the measures identified under Mitigation Measure PH-3.1, but even full implementation of these measures is not expected to fully mitigate this impact.

Table 3.6-9 shows the reduction from the BAU emissions with the implementation of the proposed Emissions Reduction Program and mitigation measures. As shown in Table 3.6-9, the resulting greenhouse gas emissions reduction from the SUMC Project would be 24.88 percent less than the BAU emissions. This reduction is still below the 30 percent reduction specified under CARB's *Climate Change Scoping Plan,* and applied in the City of Palo Alto's Climate Protection Plan. Therefore, even with Mitigation Measures CC-1.1 through CC-1.4, and TR-2.3, the SUMC Project's contribution to global climate change would be cumulatively considerable. (SU)

Construction Emissions. During construction of the SUMC Project, greenhouse gases would be emitted predominately through the operation of construction equipment. Emissions estimates for each phase of construction were based on construction equipment and the schedule provided for the SUMC Project. Table 3.6-10 shows the construction emissions for each phase of the approximately 12-year construction (details provided in Appendix H). Projected occupancy would occur by 2025. The total greenhouse gas emissions that would be generated during the 12-year construction period would be approximately 6,214 MT CO_2e, of which 1,050 MT CO_2e (17 percent) would be attributable to construction of the LPCH, 767 MT CO_2e (12 percent) would be attributable to the Hoover Pavilion Site facilities, 1,191 MT CO_2e (19 percent) would be attributable to the SoM facilities, and 3,205 MT CO_2e (52 percent) would be attributable to the SHC facilities.

Table 3.6-10
Construction Greenhouse Gas Emissions, SHC, LPCH, and SoM (MT CO_2e)

Phase	MT CO_2e	Subtotal	% by Category
LPCH Facilities			
LPCH Parking	469.75		
LPCH Expansion	580.56	1,050.32	16.90%
SCH Facilities			
SHC Parking	771.01		
Parking Structure 3 Demo	42.94		
SHC Replacement Hospital	879.25		
Core Expansion/Demo	232.83		
SHC Clinics Parking	708.58		
SHC Clinics	570.85	3,205.45	51.59%
Hoover Pavilion			
Hoover Pavilion Parking	701.14		
Hoover Pavilion MOB	66.16	767.30	12.35%
SoM Facilities			
FIM #1	349.59		
Edwards Demo	46.84		
FIM #2	346.49		
Lane Alway Demo	56.08		
FIM #3	335.79		
Grant Demo	56.06	1,190.85	19.16%
	Total CO_2e Emissions	**6,213.91**	**100.00%**

Source: PBS&J, 2010. Based on calculations provided in Appendix H.

MITIGATION MEASURE. The BAAQMD Air Quality Guidelines treat construction emissions on a basin-wide basis, rather than for individual projects. Thus, the construction greenhouse gas emissions projected for SUMC Project would not be considered significant provided the following BAAQMD recommended reduction measures are implemented. The following mitigation measure incorporates the BAAQMD recommended reduction measures for construction period emissions into the SUMC Project. (LTS)

CC-1.5 *Implement Construction Period Emission Reduction Measures.* Prior to the issuance of a grading permit the SUMC Project sponsors shall incorporate the following measures into the construction phasing plan and submit to City Planning for approval.

- Use alternative-fueled (e.g., biodiesel, electric) construction vehicles/ equipment of at least 15 percent of the fleet;
- Use local building materials of at least 10 percent; and
- Recycle at least 50 percent of construction or demolition materials.

CC-2 Emit Significant Greenhouse Gas Emissions. The proposed Emissions Reduction Program would minimize the greenhouse gas emission increases associated with the proposed development program, although the proposed Emissions Reduction Program would not reduce emissions to 30 percent below BAU. Therefore the SUMC project would have a cumulative considerable contribution to global climate change. (S)

A quantitative emissions inventory for the SUMC Project was detailed in Impact CC-1, above. As shown in the above analysis, the anticipated emissions would be above both the City of Palo Alto's Climate Protection Plan and the CARB's reduction emission goals of 30 percent below BAU emissions. SUMC Project's contribution to global climate change would be cumulatively considerable.

MITIGATION MEASURE. Mitigation Measures CC-1.1 through CC-1.5, and TR-2.3 in Section 3.4, Transportation, would reduce greenhouse gas emissions. In addition, to further reduce impacts related to greenhouse gas emissions, the City shall consider the feasibility of Mitigation Measure PH-3.1, as identified and discussed in further detail in Section 3.13, Population and Housing. The mitigation measures include:

- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- CC-1.1: Commissioning and Retro-Commissioning of Energy Systems for New and Existing Buildings.
- CC-1.2: Participation in Palo Alto Green Energy Program.
- CC-1.3: Annual Greenhouse Gas Reporting
- CC-1.4: Preparation of a Waste Reduction Audit
- CC-1.5: BAAQMD Construction Emission Reduction Measures.
- PH-3.1: Reduce the Impacts on the Jobs to Employed Residents Ratio

However, as demonstrated in Table 3.6-9, even with the implementation of all feasible mitigation measures, the anticipated emissions would remain above both the City of Palo Alto's Climate Protection Plan and the CARB's reduction emission goals of 30 percent below BAU emissions. Because these reduction levels cannot be achieved, the SUMC Project would emit significant amounts of GHGs and would have a cumulatively considerable contribution to global climate change. (SU)

3.7 NOISE

Introduction

This section of the EIR evaluates the potential for noise and ground-borne vibration impacts resulting from implementation of the SUMC Project. The description of the noise environment is based on noise measurements taken by PBS&J. Projected increases in noise levels in and around the SUMC Sites can be expected from additional traffic, increased medical helicopter flights associated with the SUMC Project, new mechanical systems installed at the new facilities, and construction activities. These noise sources are evaluated to determine whether they would cause a substantial temporary and/or permanent increase in ambient noise levels in and around the SUMC Sites; exposure of people to excessive noise levels or ground-borne vibration; and/or exceedances of standards established in the *City of Palo Alto Comprehensive Plan,* Noise Ordinance, or any other applicable standards. Standards of impact significance on which to base the assessment of potential noise/vibration impacts are identified later in this section. Mitigation measures intended to reduce identified noise impacts are provided.

This section of the EIR is based on traffic data provided in the Transportation Impact Analysis prepared by AECOM Transportation (Appendix C), the traffic and helicopter noise modeling and stationary source noise analysis conducted by PBS&J for the SUMC Project. Sources consulted for the preparation of this section include the City of Palo Alto's *Comprehensive Plan* and *Noise Ordinance*, and other reference documents by the Federal Transit Administration (FTA),[1] the Federal Interagency Committee on Aviation Noise (FICAN),[2] the U.S. Department of Transportation,[3] and the World Health Organization.[4]

Noise issues/comments identified in letters responding to the NOP and in oral and written comments received during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project were considered in preparing this analysis. Comments requested an analysis of ambulance, helicopter, vehicular traffic, and construction noise; an analysis of noise related to the Emergency Department (ED); and an analysis of noise levels throughout the day. These comments were submitted by members of the Planning and Transportation Commission, the Crescent Park Neighborhood Association, and private residents from Palo Alto and Menlo Palo. These issues are considered in this section.

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1 Federal Transit Administration, *Transit Noise Impact and Vibration Assessment*, May 2006.
2 Federal Interagency Committee on Aviation Noise (FICAN), *Effects of Aviation Noise on Awakenings from Sleep*, June 1997.
3 US Department of Transportation, *General Health Effects of Transportation Noise*, June 2002.
4 World Health Organization, *Guidelines for Community Noise*, 2000.

Characteristics of Sound, Noise, and Vibration

Sound

Sound is created when vibrating objects produce pressure variations that move rapidly outward into the surrounding air. The main characteristics of these air pressure waves are amplitude, which we experience as a sound's "loudness," and frequency, which we experience as a sound's "pitch." The standard unit of sound amplitude is the decibel (dB); it is a measure of the physical magnitude of the pressure variations relative to the human threshold of perception. The human ear's sensitivity to sound amplitude is frequency-dependent; it is more sensitive to sound with a frequency at or near 1,000 cycles per second than to sound with much lower or higher frequencies.

Most "real world" sounds (e.g., a dog barking, a car passing, etc.) are complex mixtures of many different frequency components. When the average amplitude of such sounds is measured with a sound level meter, it is common for the instrument to apply different adjustment factors to each of the measured sound's frequency components. These factors account for the differences in perceived loudness of each of the sound's frequency components relative to those to which the human ear is most sensitive (i.e., those at or near 1,000 cycles per second). This practice is called "A-weighting." The unit of A-weighted sound amplitude is also the decibel. But in reporting measurements to which A-weighting has been applied, an "A" is appended to dB (i.e., dBA) to make this clear. Table 3.7-1 lists representative environmental sounds levels.

Table 3.7-1
Representative Environmental Sound Levels

Common Outdoor Activities	Sound Level (dBA)	Common Indoor Activities
	—110—	Rock Band
Jet Fly-over at 100 feet		
	—100—	
Gas Lawnmower at 3 feet		
	—90—	
		Food Blender at 3 feet
Diesel Truck going 50 mph at 50 feet	—80—	Garbage Disposal at 3 feet
Noisy Urban Area during Daytime		
Gas Lawnmower at 100 feet	—70—	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
Heavy Traffic at 300 feet	—60—	
		Large Business Office
Quiet Urban Area during Daytime	—50—	Dishwasher in Next Room
Quiet Urban Area during Nighttime	—40—	Theater, Large Conference Room (background)
Quiet Suburban Area during Nighttime		
	—30—	Library
Quiet Rural Area during Nighttime		Bedroom at Night, Concert Hall (background)
	—20—	
		Broadcast/Recording Studio
	—10—	
Threshold of Human Hearing	—0—	Threshold of Human Hearing

Source: California Department of Transportation, 1998.

Noise

Noise is the term generally given to the "unwanted" aspects of intrusive sound. Many factors influence how a sound is perceived and whether it is considered annoying to a listener. These factors include the physical characteristics of a sound (e.g., amplitude, frequency, duration, etc.), but also non-acoustic factors (e.g., the acuity of a listener's hearing ability, the activity of the listener during exposure, etc.) that can influence the judgment of listeners regarding the degree of "unwantedness" of a sound. Excessive noise can negatively affect the physiological or psychological well-being of individuals or communities.

All quantitative descriptors used to measure environmental noise exposure recognize the strong correlation between the high acoustical energy content of a sound (i.e., its loudness and duration) and the disruptive effect it is likely to have as noise. Because environmental noise fluctuates over time, most such descriptors average the sound level over the time of exposure, and some add "penalties" during the times of day when intrusive sounds would be more disruptive to listeners. The most commonly used descriptors are:

- Leq, the equivalent energy noise level, is the average acoustic energy content of noise over any chosen exposure time.[5] The Leq is the constant noise level that would deliver the same acoustic energy to the ear as the actual time-varying noise over the same exposure time. Leq does not depend on the time of day during which the noise occurs.
- Ldn, the day-night average noise level, is a 24-hour average Leq with a 10 dBA "penalty" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for increased nighttime noise sensitivity. Because of this penalty, the Ldn would always be higher than its corresponding 24-hour Leq (e.g., a constant 60 dBA noise over 24 hours would have a 60 dBA Leq, but a 66.4 dBA Ldn).
- CNEL, the community noise equivalent level, is an Ldn with an additional 5 dBA "penalty" for the evening hours between 7:00 p.m. and 10:00 p.m.
- SEL, the sound exposure level, is the constant noise level that would deliver the same acoustic energy to the ear of a listener during a one-second exposure as the actual time-varying noise would deliver over its entire time of occurrence.[6]

Community noise exposures typically are represented by descriptors, such as a peak-hour L_{eq}, L_{dn}, or CNEL. One-hour and shorter-period L_{eq} are useful for characterizing noise caused by short-term activities, such as the operation of construction or ventilation equipment. SEL most commonly is used

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5 Averaging sound levels on the decibel scale is not done by standard arithmetic averaging, but according to the following rule: $L_{eq} = 10 \times \log((1/n) \times (10^{L1/10} + 10^{L2/10} + \ldots + 10^{Ln/10}))$; where L_1, L_2, L_n are n individual sound levels. For example, the L_{eq} of the sound levels $L_1 = 60$ dBA and $L_2 = 70$ dBA is 67.4 dBA (not 65 as it would be using standard arithmetic averaging). The higher individual sound levels contribute much more substantially to the L_{eq} than they would to an average done in the standard way.

6 For a sound lasting longer than one second, its SEL will be higher than that of the largest of the shorter duration component sounds that make up the total. For example, the SEL of a ten-second-long sound made up of 10 one-second-long component sounds, each of 60 dBA amplitude, would be 70 dBA.

to characterize the disruptive potential of noise from aircraft fly-overs, and train and heavy truck pass-bys.

Vibration

Vibrating objects in contact with the ground radiate energy through the ground; if a vibrating object is massive enough and/or close enough to the observer, its vibrations are perceptible. The ground motion caused by vibration is measured as particle velocity in inches per second and is referenced as vibration decibels (VdB).

The background vibration velocity level in residential areas is usually around 50 VdB. The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Most perceptible indoor vibration is caused by sources within buildings such as the operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings.

The general human response to different levels of groundborne vibration velocity levels is described in Table 3.7-2.

Table 3.7-2
Human Response to Different Levels of Groundborne Vibration

	Human Reaction
65 VdB	Approximate threshold of perception for many people.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Source: FTA, *Transit Noise Impact and Vibration Assessment*, May 2006.

Health and Welfare Effects of Noise Exposure

Environmental noise has a number of documented undesirable effects on human health and welfare. These effects are psychological, including annoyance and speech interference, and physiological, including hearing impairment and sleep disturbance. The following summaries of such effects were excerpted from two general reference sources by the U.S. Department of Transportation[7] and the World Health Organization.[8]

7 US Department of Transportation, *General Health Effects of Transportation Noise*, June 2002.
8 World Health Organization, *Guidelines for Community Noise*, 2000.

Annoyance. Annoyance is a general term for the overall feeling of displeasure produced by the various effects of noise, including speech interference, disturbance to comfort and peace of mind, sleep disruption, etc. The most relevant study of the effect on human annoyance was conducted by Theodore Schultz, who examined 11 major social surveys that related reported annoyance by people exposed to transportation noise.[9] The so-called "Schultz curve" relates the observed average noise level in different communities to reported annoyance. Since its publication, the Schultz curve has been used nationally and internationally as the nominal response curve for characterizing the average community response to transportation noise.

Speech Interference. Speech interference occurs when speech is masked by other sounds occurring simultaneously. Speech intelligibility is often adversely affected by noise. As the sound pressure level of noise increases, the speaker compensates by increasing voice volume, which makes additional demands on the listener. When speaker and listener are about a meter apart, relaxed conversation can occur as long as the ambient noise level is less than about 55 dBA, while conversing with raised voices is increasingly necessary as noise levels rise to 65 dBA and higher. Noise may mask not only speech, but also other acoustical signals (e.g., door bells, telephones, alarm clocks, fire alarms, music, etc.).

Hearing Impairment/Loss. Prolonged exposure to high levels of noise can cause hearing impairment, though most cases of hearing impairment were found to be related to occupational, rather than environmental, noise exposure. Outside of occupational noise exposure, deterioration of the hearing capability is caused by diseases, head trauma, hereditary factors, and normal aging.

Sleep Disturbance. It is estimated that only 10 to 20 percent of the reported cases of sleep disturbance are for reasons relating to transportation noise. The majority of sleep-disturbance research related to transportation-noise has focused on aircraft noise. Most studies focus on investigating possible secondary effects of sleep disturbance, including reduced perceived sleep quality, increased fatigue, depressed mood or well-being, and decreased performance. Although no specific long-term health effects have been clearly linked to sleep disturbance, it is recognized as intrinsically undesirable and, thus, is considered an adverse noise impact in and of itself.

Sleep disturbance studies have developed predictive models of transportation source noise-induced awakenings using SEL as the descriptor of choice. Two such models and selected values for the predicted awakening percentage as a function of aircraft-related SEL (as experienced indoors) are shown in Table 3.7-3.

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[9] Schultz, Theodore J. *Synthesis of Social Surveys on Noise Annoyance*, Journal of the Acoustical Society of America 64. pp. 377-405, August 1978.

Table 3.7-3
Sleep Disturbance Frequency as a Function of Aircraft Sound Exposure Level (SEL)

Indoor SEL	Average Percent Awakened[a]	Maximum Percent Awakened[b]
45 dBA	0.8%	1.1%
50 dBA	1.0%	1.9%
55 dBA	1.2%	2.8%
60 dBA	1.5%	3.8%
65 dBA	1.8%	5.1%
70 dBA	2.2%	6.4%
75 dBA	2.8%	7.9%
80 dBA	3.4%	9.6%
85 dBA	4.2%	11.3%

Sources:

a. Finegold and Bartholomew, *A Predictive Model of Noise Induced Awakenings from Transportation Noise Sources*, Noise Control Engineering Journal, 2001; The formula: $\%Awakened = 0.58 + (4.30 * 10^{-8}) * SEL^{4.11}$ was found to give the best-fit to the data.

b. Federal Interagency Committee on Aviation Noise (FICAN) in *Effects of Aviation Noise on Awakenings from Sleep*, June 1997.

Note that the tabulated awakening percentages (P_{ind}) apply only to a single aircraft noise event. The occurrence of multiple aviation noise events during a night (or day) would result in a higher compound awakening percentage for those exposed than that expected for one event. This compound awakening percentage (P_{tot}) would increase as the individual SEL and the number of events (n) increase according to the following formula:

$$P_{tot} = 1 - (1- P_{ind})^n$$

For example, if the individual awakening probability for one event is 5 percent, with 10 such events per night the compound awakening probability would be 40 percent.

Existing Conditions

Noise Measurements

Noise measurements were made at five locations by PBS&J on July 31, 2008 between the hours of 11:00 a.m. and 5:00 p.m. at surrounding land uses that would be considered sensitive to traffic noise. Measurements at a sixth location were added on December 4, 2008 at the closest residential use (i.e., the 1100 Welch apartments) to the Main SUMC Site. And two long-term (i.e., 48 consecutive hours) measurements were taken in September 2009. The first was on the SUMC campus along the SUMC Promenade, next to the 1089 Hospital Modernization Project Building and below its roof-top heliport. The second was at a roadside location near the 1100 Welch Road apartments. Examples of noise-sensitive uses are residences, motels and other uses where people would sleep; schools; hospitals; churches; public libraries; and parks. The land uses adjacent to the SUMC Sites include the Stanford University campus, commercial uses, park uses, and residential land uses. Single-family and multiple-family homes are located adjacent to and north of Sand Hill Road across from the SUMC Sites. An aerial map that depicts the noise measurement locations is provided as Figure 3.7-1.

Source: Stanford Univeristy Land Use & Environmental Planning, 2009.

PBS&J

FIGURE 3.7-1
Noise Measurement Locations

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The first six measurement locations represent the locations of sensitive receptors that would be most affected by noise from traffic increases associated with the SUMC Project and/or noise from roadways within the Study Area that have the highest existing and future total traffic volumes. The two long-term measurements were added to characterize the daily temporal noise level variation typical at locations on and near the SUMC Sites. Measurement location #8 is representative of on-campus noise levels at locations without close exposure to traffic on major roadways, but exposed to the influence of noise from garage activity and medical helicopter flights. Measurement location #9 is representative of noise levels experienced at locations adjacent to major roadways, but this particular location is also adjacent to the SUMC campus and so has the potential to be influenced by existing and future on-site stationary noise sources. The closest public park to the SUMC Sites, El Camino Park, is located across El Camino Real from the Stanford Shopping Center. Noise was not measured or modeled there because its exposure to traffic noise is similar to that of the Stanford Inn (measurement location #2). El Camino Park is also the closest noise-sensitive use to the Hoover Pavilion Site, which is 135 feet south of the Park across El Camino Real. The noise measurement data at the sensitive receptors were used to calibrate the Federal Highway Administration's (FHWA's) Traffic Noise Model (TNM), which was used to model the traffic noise impacts associated with the SUMC Project.

As shown in Table 3.7-4, the L_{dn} at the 1100 Welch Road apartments (measurement location #9) currently exceeds the City's "Normally Acceptable" standard of 60 dBA L_{dn} for residential land uses set in the Comprehensive Plan. The day-time L_{eq}s at measurement locations #2 through #6 also exceed 60 dBA by a substantial margin, which is strong evidence for the common exceedance of the City L_{dn} standard in areas adjacent to high traffic volume roadways.[10] These locations are at the Stanford Inn along El Camino Real, 1200 Embarcadero Road at Emerson Street, the East Palo Alto Residential Area at Michigan Avenue and University Avenue, residences at Alma Street and Lincoln Avenue, and the 1100 Welch Road apartments. While the measurements include noise from all sources in these areas, the primary source of noise at most receptors (except possibly measurement location #8, which is at ground-level below the SUMC heliport) is traffic.

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[10] *Transit Noise and Vibration Impact Assessment* (FTA May 2006), *Appendix D: Determining Existing Noise* FTA recommends that L_{dn} can be approximated with adequate precision by a measurement of hourly L_{eq} during the day of interest. For an hourly L_e measurements made between 7 a.m. and 7 p.m., $L_{dn} = L_{eq}$ - 2dBA.

Table 3.7-4
Existing Ambient Noise Measurements (dBA)

Noise Receptor Map ID[a]	Land Use Description	Duration	Noise Level L_{eq}	Noise Level L_{min}	Noise Level L_{max}	Primary Noise Source
1	Stanford West Apartments (Apt. 275) Along Sand Hill Road – residential use	10 min.	55.2	42.9	68.1	Traffic along Sand Hill Road
2	Stanford Inn – motel use	10 min.	74.5	51.3	84.0	Traffic along El Camino Real
3	1200 Embarcadero/Emerson – residential use	10 min.	70.4	50.8	85.9	Traffic along Embarcadero Road
4	East Palo Alto Residential Area – Michigan/University Avenue	10 min.	68.4	50.2	80.3	Traffic along University Avenue and Michigan Avenue
5	Alma and Lincoln Avenue – residential use	10 min.	67.7	49.0	86.8	Traffic along Alma Street
6	1100 Welch Road apartments (facing Welch Road)	10 min.	64.7	51.9	79.2	Traffic along Welch Road
7	1100 Welch Road apartments (backyard fence)	10 min.	53.5	43.9	56.9	Traffic along Welch and Sand Hill Roads
8	On SUMC campus along Promenade (near heliport)	48 hrs.	59.4*	48.2	89.3	Distant traffic, garage activity, medical helicopters
9	1100 Welch Road apartments (facing Welch Road)	48 hrs.	70.1*	45.5	113.7	Traffic along Welch Road

Source: PBS&J, 2008.
Notes:
All noise level statistics are reported in A-weighted decibels (dBA), the standard unit of sound intensity. L_{eq} is the average noise level over the measurement period, L_{min} is the minimum instantaneous noise level measured during this period, while L_{max} is the maximum instantaneous noise level measured during this period.
* These are direct measurements of L_{dn}.
a. Refer to Figure 3.7-1.

Vehicular Noise

Existing peak hour traffic L_{eq} at local noise-sensitive land uses adjacent to roadways that would be used by people traveling to and from the SUMC Sites were estimated using the FHWA's TNM model. This model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The locations for the near-roadway, short-term noise measurements were selected because they represent the locations of sensitive receptors that would be most affected by traffic noise increases associated with the SUMC Project or by traffic noise from the busiest roadways within the Study Area for the Transportation Impact Analysis. TNM was calibrated by counting traffic volumes during each measurement and adjusting the modeled noise levels to match the measured noise levels at each location. The existing peak-hour traffic L_{eq} were calculated using the calibrated TNM model and the peak-hour traffic volumes provided in the Transportation Impact Analysis (see Appendix C).

The exposure of selected local noise-sensitive land uses to modeled existing peak-hour L_{eq} noise levels is presented in Table 3.7-5. These noise levels represent only the traffic-related noise component and do not include noise from other sources. The modeled results are in close accord with the noise measurements at the selected locations (refer to Table 3.7-4). The differences were caused by variations between the receptors' and measurement locations' distances from the adjacent roadways and by variations between traffic volumes during the measurement periods and those during the peak traffic hour. According to the FTA, a measured or modeled value of peak-hour L_{eq} is about 2 dBA higher than L_{dn} if traffic noise is the dominant influence on the total ambient noise level.[11]

Table 3.7-5
Modeled Motor Vehicle Noise Levels – Peak Hour L_{eq} at Selected Locations (Existing) (dBA)[a,b]

Roadway Segment	Modeled Receptor	Existing
Sand Hill Road, east of Pasteur Drive	Residential (Location 1 on Figure 3.7-1)	57.4
El Camino Real, south of Cambridge	Motel (Location 2 on Figure 3.7-1)	75.3
Embarcadero, south of El Camino Real	Residential (Location 3 on Figure 3.7-1)	70.4
University Avenue, north of Bay Road	Residential (Location 4 on Figure 3.7-1)	70.7
Alma Street, south of Hamilton Avenue	Residential (Location 5 on Figure 3.7-1)	66.6
Welch Road, north of Pasteur Drive	Residential (Location 6 on Figure 3.7-1)	65.6

Source: PBS&J, 2010.
Notes:
a. Traffic volumes provided in the Transportation Impact Analysis by AECOM Transportation, provided as Appendix C to this EIR.
b. Noise levels were calculated with TNM at the measured setbacks of the existing residential buildings.

Mechanical Equipment and Loading Noise

Loading. Other sources of noise within the area are generated from mechanical equipment and loading area noise. Currently, one shared loading dock serves SHC and LPCH at the Main SUMC Site; it is located along Quarry Road (see Figure 2-5 in Section 2, Project Description). There are currently approximately 32,850 annual deliveries (105 deliveries per day based upon loading activity six days per week) at the Main SUMC Site; this total is divided into 24,638 (75 percent) for SHC and 8,212 (25 percent) for LPCH.[12] The percentage of loading vehicle trips by vehicle types is as follows: tractor trailers (53 feet long), 25 percent; box trucks/cab-overs (18 feet to 48 feet long), 30 percent; parcel delivery vehicles (10 feet to 18 feet long), 20 percent; and courier vans and trucks (10 feet to 18 feet long), 25 percent.[13]

11 Federal Transit Administration, *Transit Noise Impact and Vibration Assessment*, May 2006, Appendix D.
12 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5.
13 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5.

Loading activities involving small- to medium-sized trucks (i.e., the box trucks/cab overs, parcel delivery vehicles and courier vans, as noted above) generate noise levels in the range of 60 to 65 dBA at 50 feet (e.g., during idling, backing, and use of hydraulic lift gates). Loading activities involving larger trucks (i.e., the tractor trailers, as noted above) generate noise in the range of 70 to 75 dBA at 50 feet. Trash compaction and collection typically generate noise levels ranging from 70 to 75 dBA at 50 feet. Traffic circulation and parking lot noise levels typically range from 60 to 65 dBA at 50 feet.[14]

Mechanical Equipment. Equipment serving the existing SUMC is installed at many locations on-site and at Stanford's Central Energy Facility (CEF), which provides steam and chilled water to the SUMC and is located about 800 feet west of the Main SUMC Site on the Stanford University campus. The CEF is being expanded, but that expansion would be permitted separately from the SUMC Project and its effects are not included in this noise impact analysis. There are 12 emergency generators on the SUMC Site plus a back-up generator.[15] Rooftop heating, ventilation, and air conditioning (HVAC) equipment is located on all SUMC buildings. Noise levels associated with existing SUMC HVAC equipment were measured on December 4, 2008; the measurement locations are listed in Table 3.7-6.

Table 3.7-6
Measurements of Noise from Existing SUMC Rooftop HVAC Equipment

Noise Receptor Map ID	Measurement Location[a]	Duration (minutes)	Noise Level (dBA)			Equipment; Distance to Meter; Noise Control
			L_{eq}	L_{min}	L_{max}	
1	Hospital Modernization Project Building (next to heliport)	10	63.9	62.0	75.3	3 HVAC units; 50 - 100 feet All units enclosed
2	Core Expansion Building	10	65.3	62.9	75.3	Exhaust fan; 30 feet; No enclosure
3	Hospital Modernization Project Building (D Pod)	10	75.1	73.0	81.2	HVAC; 25 feet Full enclosure
4	Advanced Medicine Center	10	65.4	63.8	74.1	HVAC; 25 feet Sound walls

Source: PBS&J, 2008.

Notes:

All noise level statistics are reported in A-weighted decibels (dBA), the standard unit of sound intensity. L_{eq} is the average noise level over the measurement period, L_{min} is the minimum instantaneous noise level measured during this period, while L_{max} is the maximum instantaneous noise level measured during this period.

a. Refer to Figure 2-5.

[14] Wilson, Ihrig & Associates, Inc., Balfour Center Safeway Noise Analysis – Brentwood, California, June 6, 2002.

[15] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6.

Ambulance and Helicopter Operations

Sources of ambient noise in and around the SUMC Sites include helicopters and ambulances transporting patients to and from the Main SUMC Site.

Helicopter Operations. Currently there are about 2,120 helicopter trips per year (about six daily) associated with hospital operations.[16] Approximately half of the helicopter trips are associated with patient and organ transport, and approximately half are for the purpose of refueling. Five to six flights per year are to travel offsite for maintenance. There are currently four paths for helicopter approach and departure to the SUMC heliport.[17] In all the paths, the helicopters are initially maneuvered in a circular motion directly above the Stanford University Arboretum, in order to change altitude for the purpose of minimizing the noise impacts on the surrounding area. The pilots generally rise to an altitude of 1,500 feet prior to flying out of the vicinity of the SUMC Sites.[18] Figure 3.7-2 and Figure 3.7-3 show the existing L_{dn} (i.e., the 24-hour noise level with a penalty added to nighttime noise events) and SEL (i.e., the noise energy level from a typical helicopter approach/departure compressed into one second) noise contours from existing helicopter operations, as determined by PBS&J noise modeling. The 60 dBA L_{dn} contour does not extend into the residential areas north of Sand Hill Road; note also that 60 dBA L_{dn} is the "Normally Acceptable" residential noise exposure compatibility standard set in the Comprehensive Plan. A single helicopter would produce a maximum SEL of 85 dBA, as shown by the SEL contours, which result from a helicopter flying at 1,500 feet as it approaches/departs the heliport. The SEL contour does not "close" around the heliport as the L_{dn} contour because it assumes that helicopters would not gain additional altitude as they approach/depart the heliport and, thus, reduce the maximum SEL at ground level.

Ambulance Activity. The existing ED, where ambulance trips are destined, is located at the south side of the Hospital Core Expansion, off Quarry Road. Most ambulance trips end at the SHC emergency ward near the terminus of Quarry Road. In 2006, there were 8,331 ground ambulance trips (about 23 trips per day) to the SHC ED. The total ambulance trips comprise 19.6 percent of the total 42,522 ED visits for that year. Of the total ambulance trips, approximately 10 percent are "Code 3" trips, meaning that they involve the use of lights and a siren.[19] A typical SEL of an ambulance passby, which lasts about 12 seconds, is 112 dBA with an L_{max} of about 106 dBA, if the siren is engaged. The City's Noise Ordinance (Municipal Code Section 9.10.050) exempts noise associated with "emergencies" from its standards and penalties.

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[16] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5.

[17] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5.

[18] Catherine Palter, Stanford University Land Use and Environmental Planning, Memorandum: Data Needs for SUMC Project EIR- Response, February 20, 2008.

[19] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5.

Source: PBS&J, 2007.

FIGURE 3.7-2
Existing Day-Night Average Sound Level (DNL) Noise Contours

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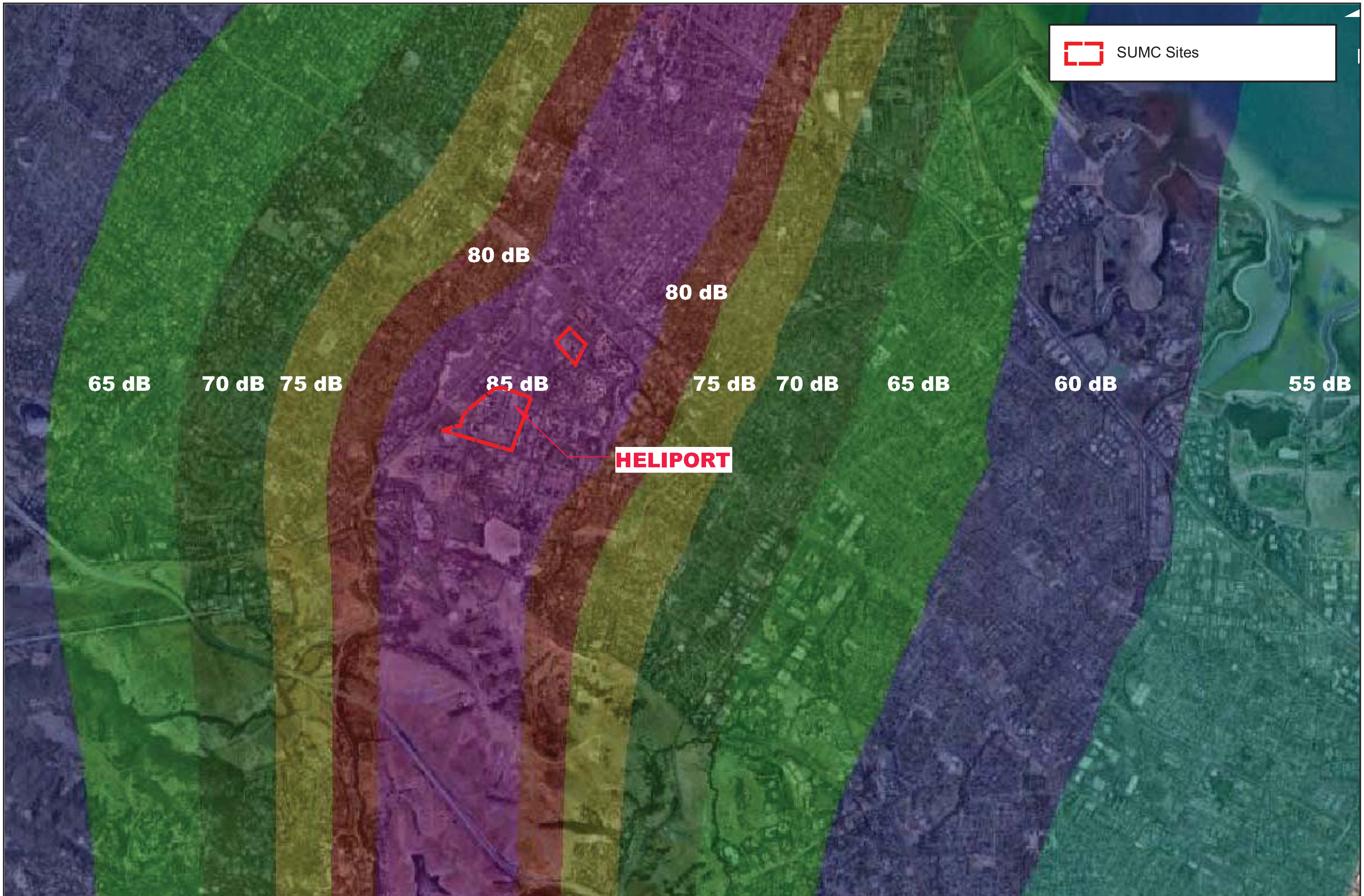

Source: PBS&J, 2007.

PBS&J

FIGURE 3.7-3
Existing Sound Exposure Level (SEL) Contours

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Applicable Plans and Regulations

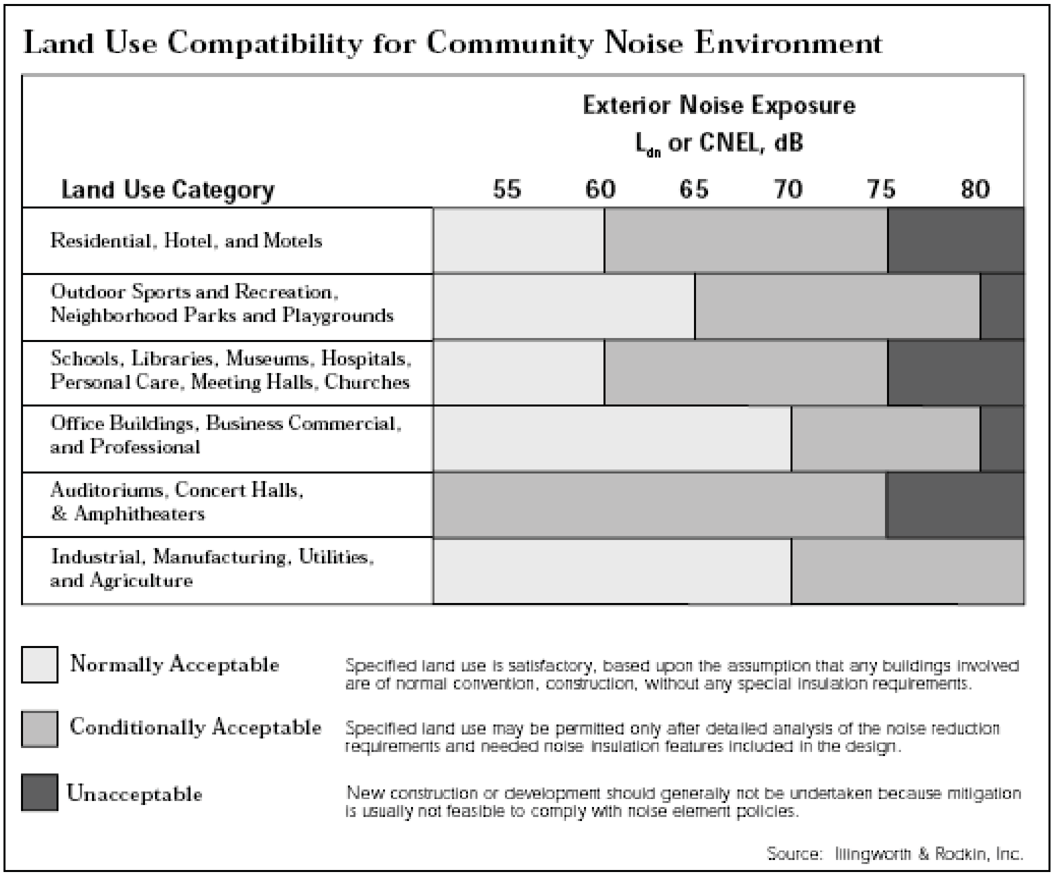
For this analysis, the primary applicable plans and regulations pertaining to noise are from the City's Comprehensive Plan and Noise Ordinance. However, there are cases where these local plans and regulations do not contain quantitative thresholds to evaluate the impact of certain types of noise emissions or vibration. In those cases, quantitative standards specified by comparable federal or State standards are utilized. For example, the City's Comprehensive Plan does not specify a numeric threshold for unacceptable vibration emissions. In this case, this analysis considers the vibration thresholds specified in the Federal Transit Administration's *Transit Noise Impact and Vibration Assessment* (FTA Guidelines). These standards provide a qualitative framework for analyzing whether the SUMC Project is consistent with the Comprehensive Plan Noise policies.

City of Palo Alto Comprehensive Plan

The Natural Environment Element of the Comprehensive Plan establishes Goal N-8, which aims to create "an environment that minimizes the adverse impacts of noise." The following Comprehensive Plan policies are relevant to the evaluation of the SUMC Project and specify CEQA noise significance criteria are specifically included in this EIR's Standards of Significance:

Policy N-39. Encourage the location of land uses in areas with compatible noise environments using the guidelines in the *Land Use Compatibility for Community Noise Environment* table (included below) to determine compatibility.

- The guideline for maximum outdoor noise levels in residential areas is an L_{dn} of 60 dBA. This level is a guideline for the design and location of future development and a goal for the reduction of noise in existing development. However, 60 dBA Ldn is a guideline which cannot necessarily be reached in all residential areas within the constraints of economic or aesthetic feasibility. This guideline will be primarily applied where outdoor use is a major consideration (e.g., backyards in single family housing developments, and recreational areas in multiple family housing projects). Where the City determines that providing 60 dBA Ldn or lower outdoors is not feasible, the noise level in outdoor areas intended for recreational use should be reduced to as close to the standard as feasible through project design.
- The indoor noise level as required by the State of California Noise Insulation Standards must not exceed 45 dBA Ldn in multiple-family dwellings. This indoor criterion shall also apply to new single family homes in Palo Alto.
- Interior noise levels in new single family and multiple family residential units exposed to an exterior Ldn of 60 dBA or greater should be limited to a maximum instantaneous noise level of 50 dBA in the bedrooms. Maximum instantaneous noise levels in other rooms should not exceed 55 dBA.



Policy N-41. When a proposed project is subject to CEQA, the noise impact of the project on existing residential land uses should be evaluated in terms of the increase in existing noise levels and potential for adverse community impact, regardless of existing background noise levels. If an area is below the applicable maximum noise guideline, an increase in noise up to the maximum should not necessarily be allowed. A project should be considered to cause a significant degradation of the noise environment if it meets any of the following criteria:

- The project would cause the L_{dn} to increase by 5.0 dBA or more in an existing residential area, even if the L_{dn} would remain below 60 dBA;
- The project would cause the L_{dn} to increase by 3.0 dBA or more in an existing residential area, thereby causing the L_{dn} in the area to exceed 60 dBA; and
- The project would cause an increase of 3.0 dBA or more in an existing residential area where the Ldn currently exceeds 60 dB.

City of Palo Alto Noise Ordinance

Protection of the population of Palo Alto from "excessive, unnecessary, and unreasonable noises from any and all sources in the community" is implemented through the City's Noise Ordinance (Chapter 9.10 of the *Palo Alto Municipal Code*). The following sections of the Noise Ordinance are relevant to the evaluation of the SUMC Project.

9.10.040 Commercial and Industrial Property Noise Limits.[20] No person shall produce, suffer or allow to be produced by any machine or device, or any combination of same, on commercial or industrial property, a noise level more than eight dB above the local ambient[21] at any point outside of the property plane.

9.10.060 Special provisions.

a) *General Daytime Exception*. Any noise source which does not produce a noise level exceeding 70 dBA at a distance of 25 feet under its most noisy condition of use shall be exempt from the provisions of Section 9.10.040 between the hours of 8:00 a.m. and 8:00 p.m. Monday through Friday, 9:00 a.m. and 8:00 p.m. on Saturday, except Sundays and holidays, when the exemption herein shall apply between 10:00 a.m. and 6:00 p.m.

b) *Construction*. Construction, alteration and repair activities on non-residential property which are authorized by valid City building permit shall be prohibited on Sundays and holidays and shall be prohibited except between the hours of 8:00 a.m. and 6:00 p.m. Monday through Friday, 9:00 a.m. and 6:00 p.m. on Saturday provided that the construction, demolition or repair activities during those hours meet the following standards:

   1) No individual piece of equipment shall produce a noise level exceeding 110 dBA at a distance of 25 feet. If the device is housed within a structure on the property, the measurement shall be made out-side the structure at a distance as close to twenty-five feet from the equipment as possible.

   2) The noise level at any point outside of the property plane of the project shall not exceed 110 dBA.

   3) The holder of a valid construction permit for a construction project in a non-residential zone shall post a sign at all entrances to the construction site upon commencement of construction, for the purpose of informing all contractors and subcontractors, their employees, agents, material men and all other persons at the construction site, of the basic requirements of this chapter.

      A. Said sign(s) shall be posted at least five feet above ground level, and shall be of a white background, with black lettering, which lettering shall be a minimum of one and one-half inches in height.

      B. Said sign shall read as follows: Construction hours for non-residential property; (Includes Any and All Deliveries); Monday - Friday 8:00 a.m. to 6:00 p.m.; Saturday 9:00 a.m. to

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[20] Sections 9.10.030, 9.10.040 and 9.10.050 of the Noise Ordinance specify limits for noise sources located on residential, commercial/industrial, and public properties, respectively. Only the limits for commercial/industrial properties are included in this EIR because, from the perspective if noise emissions, the commercial/industrial land use type is the most similar or applicable to that of the SUMC Project.

[21] "Local ambient" by Noise Ordinance definition means the "lowest sound level repeating itself during a six-minute period as measured with a precision sound level meter, using slow response and "A" weighting … in no case shall the local ambient be considered or determined to be less than thirty dBA for interior noise or Forty dBA in all cases."

6:00 p.m., Sunday/holidays Construction prohibited. Violation of this Ordinance is a misdemeanor punishable by a maximum of six months in jail, $1,000 fine, or both; Violators will be prosecuted.

c) *Emergencies*. Emergencies (e.g., noise associated with ambulance sirens, medical helicopter operations, etc.) are exempt from Noise Ordinance limits and provisions.

Finally, the implementation of Palo Alto Municipal Code Section 10.48 requires that construction-related trucks use specified truck routes to access the site and that projects follow standard construction techniques and best management practices, including the development of a Construction Management Plan, which would identify measures to reduce construction noise and consequent annoyance at sensitive receptors.

Advisory Guidance, Regulations, and Standards of Federal and State Agencies

Federal Standards. The FTA has developed methodology and significance criteria to evaluate noise and vibration impacts from surface transportation modes (i.e., passenger cars, trucks, buses, and rail) as presented in *Transit Noise Impact and Vibration Assessment* (FTA Guidelines). The FTA criteria, shown in Table 3.7-7, are based on limiting annoyance in communities exposed to vibration from transportation sources and construction activity.

Table 3.7-7
Federal Transit Administration Ground-Borne Vibration (GBV)
Impact Criteria for General Assessment

Land Use Category	GVB Impact Levels (VdB)		
	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Category 1: Buildings where vibration would interfere with interior operations	65[d]	65[d]	65[d]
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime uses	75	78	83

Source: FTA, *Transit Noise Impact and Vibration Assessment*, May 2006.

Notes:

a. "Frequent Events" is defined as more than 70 vibration events of the same source per day.
b. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.
c. "Infrequent Events" is defined as fewer than 30 vibration events of the same source per day.
d. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels.

Federal Aviation Administration (FAA) regulations (i.e., Part 150, Airport Noise Compatibility Planning) prescribe the methodology governing the development, submission, and review of airport/heliport noise exposure maps and noise compatibility programs. The noise exposure maps use average annual L_{dn} or CNEL contours around the airport/heliport as the primary noise descriptor. To the FAA, all land uses are considered compatible when aircraft noise effects are less than 65 dBA L_{dn} or CNEL. At higher noise exposures, increasing restrictions are applied to development within the aircraft noise contours depending upon the noise-sensitivity of the land use and the degree of noise attenuation required in the structures' interior spaces.

The FAA also recommends the use of supplemental metrics in environmental documents to further describe aircraft noise impacts with respect to specific adverse noise effects on specific populations or activities.[22] Among the most commonly recognized adverse noise effects are increases in community annoyance, sleep disturbance, speech interference and disruption of learning in schools. The effect of aviation noise on sleep is often a particular concern of communities located near airports. Based on research carried out on sleep disturbance, the Federal Interagency Committee on Aviation Noise (FICAN) has recommended the adoption of a dose-response curve based on single-event aviation noise events (as quantified by SEL) for predicting the percent of an exposed population (not including children) expected to be awakened in long-term residential settings, as shown in Table 3.7-3. In order to reduce potential aviation-related sleep disruption to acceptable levels in areas near airports/heliports, it may be necessary to install additional acoustic insulation above what would be required to attain/maintain the 45 dBA interior Ldn/CNEL standard required by FAA Part 150.

State Standards. The California Noise Insulation Standards (California Code of Regulations, Title 25, Section 1092) establishes uniform minimum noise insulation performance standards for new hotels, motels, dormitories, apartment houses and dwellings other than detached single-family dwellings. Specifically, Title 25 states that interior noise levels attributable to exterior sources shall not exceed 45 dBA L_{dn} or CNEL in any habitable room of new dwellings. Acoustical studies must be prepared for proposed multiple unit residential and hotel/motel structures where outdoor Ldn or CNEL is 60 dBA or greater. The studies must demonstrate that the design of the building will reduce interior noise to 45 dBA L_{dn} or CNEL, or lower. Dwellings are to be designed so that interior noise levels will meet this standard for at least ten years from the time of building permit application. Interior noise levels can be reduced through the use of noise insulating windows, and by using sound isolation materials when constructing walls and ceilings. The primary means to achieve this standard is through the use of noise insulating windows, and/or sound isolation materials when constructing walls and ceilings. (It should be noted that Comprehensive Plan Policy N-39 applies the Title 25 standard to all single- and multi-family residential uses in the City).

Impacts and Mitigation Measures

Methodology

The analysis of the existing and future noise environments is based on noise-level monitoring, noise-prediction computer modeling, and empirical observations of receptor noise exposure characteristics. Existing noise levels were monitored at selected locations in and around the SUMC Sites (see Table 3.7-4 with Figure 3.7-1, and Table 3.7-6) using a Larson-Davis Model 820 sound level meter, which

[22] Federal Aviation Administration, *Environmental Desk Reference for Airport Actions*, October 2007, Table 17.1.

satisfies the American National Standards Institute (ANSI) for general environmental noise measurement instrumentation.

Traffic noise modeling procedures involved the calculation of existing and future vehicular noise levels at selected noise-sensitive uses in and around the SUMC Sites. This task was accomplished using the FHWA TNM. The model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (energy rates) utilized in TNM reflect the latest measurements of average vehicle noise rates for all vehicle classes. Traffic volumes utilized as data inputs in the noise prediction model were provided through the traffic analysis prepared for this EIR.

Helicopter noise levels were estimated using the FAA Integrated Noise Model (INM). INM was initialized with project-specific data on helicopter type, number of daily flight operations at SUMC, their approach/departure routes, and the existing and proposed future heliport locations. The noise analysis produced existing and future-with-project L_{dn} and SEL noise contours for the vicinity of the SUMC Sites.

Construction noise and vibration levels were quantified using equipment noise reference levels and modeling techniques developed by the FTA.

Standards of Significance

Based on thresholds specified in the Natural Environment Element of the Comprehensive Plan, the City of Palo Alto Noise Ordinance, and other thresholds specified by the City as appropriate to CEQA documents; and based on supplementary standards from the FTA (specifically for vibration) and FAA/FICAN (specifically for aircraft noise), the SUMC Project would result in a significant noise impact if it would:

During SUMC Project Construction

- Generate construction noise exceeding the daytime background L_{eq} at sensitive receptors by 10 dBA or more; or
- Expose persons to or generate excessive ground-borne vibrations during construction as determined according to FTA vibration criteria (shown in Table 3.7-4).

During SUMC Project Operation

- For SUMC-related traffic, ambulance operations and medical helicopter flights, cause L_{dn} to:
  - Increase by 5 dBA or more in an existing residential area, even if the Ldn would remain below 60 dBA;
  - Increase by 3 dBA or more in an existing residential area, thereby causing the Ldn in the area to exceed 60 dB; or
  - Increase by 3 dBA or more in an existing residential area where the Ldn currently exceeds 60 dBA (all as specified in CP Policy N-41).

- For SUMC-related medical helicopter flights, cause substantial increases in sleep disturbance in residential neighborhoods as determined according to FICAN SEL/Awakening data (as specified in Table 3.7-3.
- Cause an increase in noise from on-site, SUMC Project stationary sources or activities (i.e., HVAC equipment, emergency generator testing, loading dock activity, etc., all of which fit the definition of "any machine, animal, or device, or any combination of same, on commercial or industrial property," as specified by Noise Ordinance Section 9.10.040) of 8 dBA or more above the local ambient at any point outside the property plane of the project site, unless the Ordinance's General Daytime Exception applies (i.e., source noise level less than 70 dBA at a distance of 25 feet during the hours specified in Noise Ordinance Section 9.10.060(b)).

Environmental Analysis

NO-1. Construction Noise. Construction of the SUMC Project would create a substantial temporary increase in ambient noise levels on the SUMC Sites compared to existing ambient noise levels. The noise increase would be a significant impact to the sensitive uses (i.e., patients) on the Main SUMC Site during construction. (S)

Construction of the SUMC Project is anticipated to occur over approximately 12 years. Approximately 1.2 million square feet of existing buildings would be demolished. Construction activities would include demolition, site preparation, grading, placement of infrastructure, placement of foundations for structures, and fabrication of structures. Demolition and construction activities would require the use of heavy trucks, excavating and grading equipment, concrete breakers, concrete mixers, and other types of mobile and stationary construction equipment.

The SUMC Project application[23] indicates that heavy-duty equipment such as excavators, a drill rig, concrete mixers, and pump trucks would be used during the demolition of existing buildings, foundations, and below-grade work. Table 3.7-8 provides average noise levels for standard construction equipment.

The noise impacts of a project are usually defined as effects on sensitive receptors outside the project boundaries, rather than those on the project site itself. However, because the SHC and LPCH would continue to operate during construction, hospital patients, visitors, and SUMC employees at the Main SUMC Site would experience construction noise and must be considered sensitive receptors for purposes of analyzing construction noise associated with the SUMC Project. The closest off-site sensitive land use that could be affected by noise from construction activities is the 1100 Welch Road apartments, approximately 200 feet from the Main SUMC Site. The Stanford West Apartments, located approximately 500 feet from the Main SUMC Site, across Sand Hill Road, could also be affected.

[23] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 8.

Table 3.7-8
Average Noise Levels and Abatement Potential of Construction Equipment Noise at 50 and 100 Feet (dBA)

Equipment	Noise Level at 25 Feet (Before Mitigation)	With Feasible Noise Control[a] (After Mitigation)	Noise Level at 50 Feet (Before Mitigation)	With Feasible Noise Control[a] (After Mitigation)
Earthmoving				
Front Loaders	85	81	79	75
Backhoes	91	81	85	75
Dozers	86	81	80	75
Tractors	86	81	80	75
Scrapers	94	86	88	80
Graders	91	81	85	75
Trucks	97	81	91	75
Pavers	95	86	89	80
Materials Handling				
Concrete Mixer	91	81	85	75
Concrete Pump	88	81	82	75
Crane	89	81	83	75
Derrick	94	81	88	75
Stationary				
Pumps	82	81	76	75
Generator	84	81	78	75
Compressors	87	81	81	75
Impact				
Jack Hammers	94	81	88	75
Pneumatic Tools	92	86	86	80
Other				
Saws	84	81	78	75
Soil Vibrators/ Compactors	82	81	76	75

Source: U.S. Environmental Protection Agency, December 1971.
Note:
a. Feasible noise control methods include selection of quieter procedures or machines and implementation of noise-control features requiring no major redesign or extreme cost, such as equipment mufflers.

On-site construction activities would expose on-site noise-sensitive uses (especially the in-patient hospital uses at SHC and LPCH) to high noise levels from operation of multiple pieces of construction equipment working simultaneously. Measurements of background noise levels on the Main SUMC Site indicate that the average hourly daytime noise levels range between 55 dBA and 60 dBA in areas not close to the Main SUMC Site access roads. Construction noise levels could easily and often be 10 dBA or more higher than existing ambient when construction is occurring nearby and be an on-going source of annoyance for patients, visitors, and workers. Therefore, construction noise would be significant for on-site noise-sensitive receptors, especially patients.

In contrast, the closest off-site sensitive receptors would be farther from the loci of typical construction activity on-site and daytime background noise levels there would be higher because they are adjacent to major access roads. At 1100 Welch Road apartments, the current average hourly daytime background noise levels range between 65 dBA and 70 dBA. Noise from most construction equipment ranges in the mid-80s dBA at 50 feet and decreasing to the low 70s dBA at 200 feet (see Table 3.7-8). Thus, the maximum incremental effect of typical construction noise on ambient noise levels at the nearest off-site noise-sensitive use would be less than 10 dBA (e.g., with a background noise level of 65 dBA, and a construction noise effect of 73 dBA, both worst-case assumptions, the combined noise level would be 74 dBA, a less-than-10 dBA increase). Thus, the maximum incremental effect of construction activity on ambient noise levels at the nearest off-site noise-sensitive use would be less than 10 dBA, which is a less-than-significant impact.

MITIGATION MEASURE. The following mitigation measures would not reduce construction noise impacts to on-site sensitive receptors to less-than-significant levels, although they would lessen construction-related noise. (SU)

NO-1.1 *Implement Best Management Practices to Reduce Construction Noise.* The SUMC Project sponsors shall incorporate the following practices into the construction documents to be implemented by the SUMC Project contractor:

a. Provide enclosures such as heavy-duty mufflers for stationary equipment, shrouding or shielding for impact tools, and barriers around particularly noisy operations on the site.

b. Use quiet construction equipment whenever possible, particularly air compressors.

c. Provide sound-control devices on equipment no less effective than those provided by the manufacturer.

d. Locate stationary equipment, material stockpiles, and vehicle staging areas as far as practicable from sensitive receptors.

e. Prohibit unnecessary idling of internal combustion engines.

f. Require applicable construction-related vehicles and equipment to comply with the City's truck route ordinance.

g. Designate a noise disturbance coordinator who shall be responsible for responding to complaints about noise during construction. The telephone number of the noise disturbance coordinator shall be conspicuously posted at the construction site and shall be provided to the City. Copies of the construction schedule shall also be posted at nearby noise-sensitive areas.

NO-2. Construction Vibration. Construction of the SUMC Project would have less-than-significant vibration impacts. (LTS)

Vibration Annoyance. Construction activities cause varying degrees of ground vibration depending on the equipment and methods employed. Such ground vibrations diminish in strength with distance from the source. Ground vibrations from construction activities can be strong enough to damage adjacent existing structures in some case, but their effects are more usually limited to annoyance to occupants of nearby buildings. Annoyance potential is generally related to vibration velocity levels expressed in vibration decibels (VdB).

The vibration velocity levels for typical construction equipment are shown below in Table 3.7-9. Construction equipment, including large bulldozers, could operate immediately adjacent to SoM research facilities and farther (25 feet for more) from buildings in use by hospital inpatients and outpatients. Vibration levels from heavy equipment operating adjacent to SUMC buildings could reach as high as approximately 87 VdB on site, as shown in Table 3.7-9, while vibration levels at the 200-foot setback of the 1100 Welch Road apartments, which is the closest offsite sensitive receptor to the potential pile driving location, would be about 60 VdB.

Table 3.7-9
Vibration Decibel Levels for Construction Equipment (VdB)

Construction Equipment	Approximate VdB at 25 feet
Large Bulldozer	87
Truck	86
Jackhammer	79
Small Bulldozer	58

Source: FTA, *Transit Noise Impact and Vibration Assessment*, 2006.

On the Main SUMC Site, vibration levels of 87 VdB would be considered significant, even if it were infrequent, because it would exceed 80 VdB at buildings where people normally sleep and 83 VdB at institutional buildings. These vibration levels would not, however, be expected to occur at night in close proximity to the hospital buildings, and the SoM can adjust its research operations to avoid any effects from construction vibration on the Main SUMC Site. As such, the annoyance impact of general construction vibration on the Main SUMC Site and at sensitive receptors off site would be less than significant.

Vibration Damage. Construction vibration can also cause structural damage in nearby buildings if the vibration levels are strong enough. Table 3.7-10 summarizes the ground motion caused by various types of construction equipment. The lowest vibration level at which construction activity would begin to cause damage in fragile buildings (which includes, but is not limited to, historic buildings) is 0.120 inch per second. This damage threshold could be exceeded if large bulldozers were to operate within 20 feet of a fragile structure. For more robust structures, the damage threshold is higher, for example 0.3 inch per second for "engineered concrete and masonry" buildings, as defined and recommended by the FTA. This latter damage threshold could be exceeded only if impact pile drivers were to operate within 50 feet of an engineered concrete or masonry building.

Table 3.7-10
Vibration Source Levels for Construction Equipment

Equipment	Peak Particle Velocity at 25 Feet (in/sec)
Large Bulldozer	0.089
Loaded Truck	0.076
Jackhammer	0.035
Small Bulldozer	0.003

Source: FTA, *Transit Noise Impact and Vibration Assessment*, Chapter 12, 2006.

There is little potential for structural damage to the closest off-site structures (i.e., the 1100 Welch Road apartments), which are about 200 feet away from the nearest construction site, or to on-site structures, which in all cases (except for the Hoover Pavilion building, as discussed below) would have at least a 25-to-50-foot buffer zone between them and any construction site. Thus, the potential for vibration damage to any on- or off-site structures would be less than significant.

Potential vibration effects on the historic Hoover Pavilion building are addressed in Section 3.8, Cultural Resources.

NO-3. Operational Noise Impacts from Transportation Sources. Increased traffic and helicopter noise levels due to implementation of the SUMC Project would be less than significant. However, noise from ambulances due to implementation of the SUMC Project would increase along Sand Hill Road west of El Camino Real, and would increase roadside noise levels by an amount considered unacceptable under the policies of the City Comprehensive Plan. (S)

Vehicular Traffic. Traffic noise is of most concern in areas where noise-sensitive receptors (e.g., residential areas) are adjacent to major SUMC Project access roads. For this analysis, the roadway segments of most concern are Sand Hill Road, El Camino Real, Embarcadero Road, University Avenue, Alma Street, and Welch Road. According to the Transportation Impact Analysis prepared for the SUMC Project (see Appendix C), the SUMC Project would increase traffic volumes along these roads, which would result in a corresponding increase in traffic noise. Existing traffic noise levels along the identified roadway segments are presented in Table 3.7-11, which shows that noise levels along all but Sand Hill Road already exceed the City's guideline of 60 dBA for residential land uses. The changes in noise levels expected by the year 2025 are also shown. The SUMC Project-related traffic would increase noise levels along roadways most affected by SUMC Project traffic by a maximum of 0.3 dBA Ldn along Welch Road. The increase in noise would not exceed the City of Palo Alto Comprehensive Plan's 3 dBA standard. Therefore, the SUMC Project's traffic noise impacts would be less than significant along these roadways.

Table 3.7-11
Modeled Motor Vehicle Noise Levels (L_{dn}) at
Selected Locations (2025) (dBA)[a]

Roadway Segment	Receptor	Existing	2025 Without Project	2025 Baseline plus SUMC	Increase over Existing	SUMC Contribution
Sand Hill Road, east of Pasteur Drive (Location 1 on Figure 3.7-1)	Residential	55.4	56.2	56.5	1.1	0.3
El Camino Real, south of Cambridge (Location 2 on Figure 3.7-1)	Residential	73.3	73.7	73.9	0.6	0.2
Galvez, west of El Camino Real (Location 3 on Figure 3.7-1)	Residential	68.4	68.8	68.9	0.5	0.1
University Avenue, east of Bay Road (Location 4 on Figure 3.7-1)	Residential	68.7	69.1	69.2	0.5	0.1
Alma Street, south of Hamilton Avenue (Location 5 on Figure 3.7-1)	Residential	64.6	65.4	65.4	0.8	0.0
Welch Road, north of Pasteur Drive (Location 6 on Figure 3.7-1)	Residential	63.6	63.0	63.3	-0.3	0.3

Source: PBS&J, 2008.
Note:
a. Traffic volumes provided by AECOM Transportation (see Appendix C).

Heliport Operations. Under the SUMC Project, heliport operations would increase by 28 percent by 2025, specifically from the existing 2,120 annual helicopter trips (six daily trips) to 2,714 (seven daily trips, an increase of about one trip per day).[24] These helicopter trips could occur during daytime or nighttime because they are emergency-related. Trips associated with refueling and maintenance are included in these projections.

The helicopter approach and departure paths would generally remain the same as current paths. That is, departures would proceed northward initially, just short of Sand Hill Road, where the helicopter would turn to the southwest over the Stanford University campus. The approach path to the heliport is from the southwest. According to the SUMC Project application, flight

24 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5.

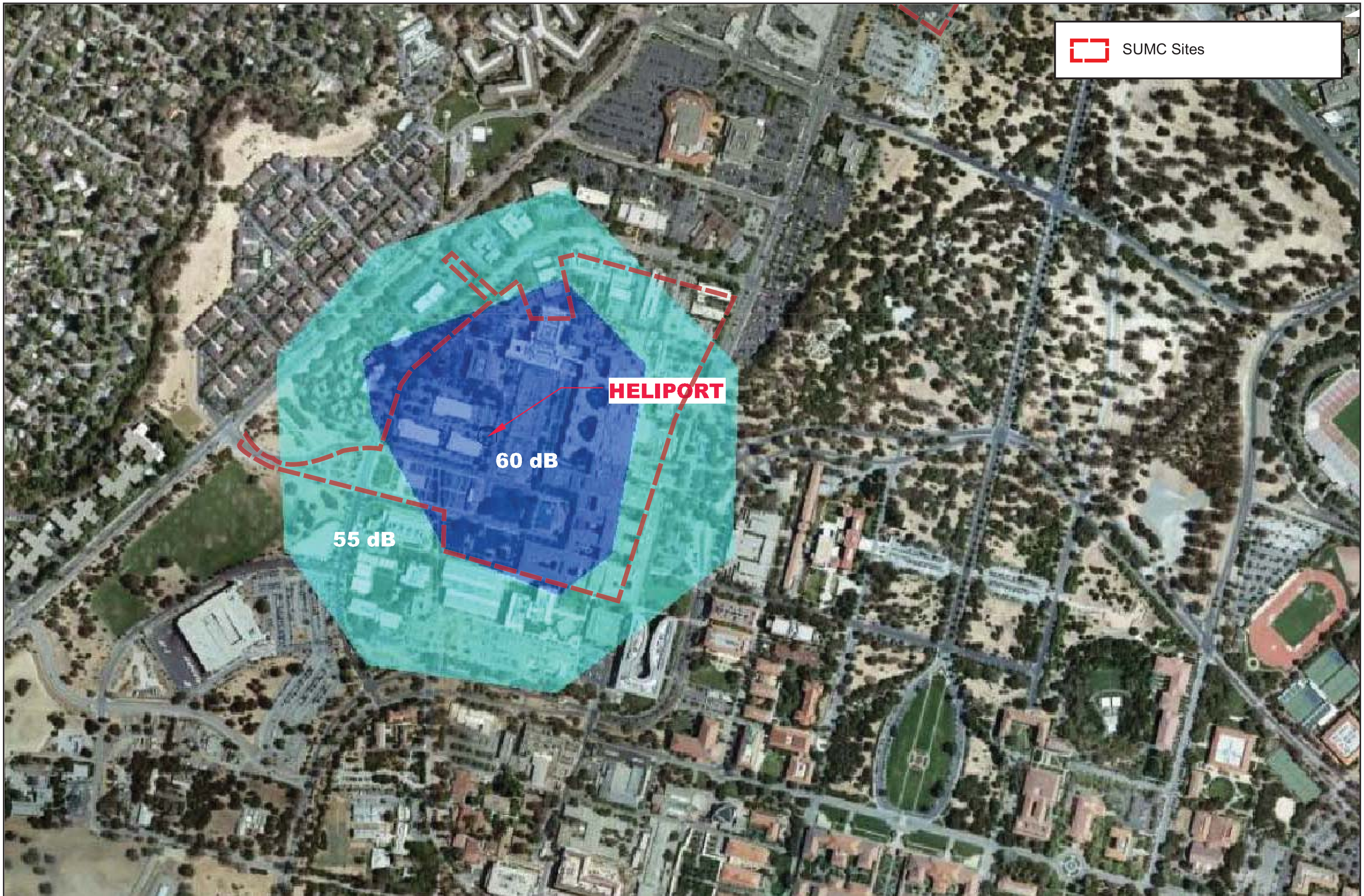
paths are designed to avoid residential areas where possible. To help minimize noise concerns, the helicopter is typically flown at a minimum height of 1,500 feet until descent within the immediate SUMC Sites area. This pattern would continue with implementation of the SUMC Project. As shown in Figure 2-10 in Section 2, Project Description, the new heliport would be located on the roof of the new SHC hospital building at a height of 130 feet. As previously stated, the existing heliport is designed to accommodate one helicopter arrival or departure at a time, and the maximum helicopter size is 57 feet long and 12,000 pounds. It is anticipated that helicopters regularly using the new heliport would be the same size as existing helicopters. However, the new heliport would be constructed to accommodate a helicopter of up to 22,000 pounds due to requirements at a hospital, to be able to accommodate larger helicopters in the event of a natural disaster or other large-scale emergency. The SUMC Project sponsors anticipate that the existing heliport could remain operational after project construction in order to accommodate organ transport to LPCH. Retention of the existing heliport would not increase the number or frequency of helicopter flights to the SUMC compared with a scenario in which the existing heliport is decommissioned. This is because helicopter trips are correlated with the patient census, not the number of landing pads. The new heliport would be the primary heliport, and would be used for patient transfer to the ED.

The noise analysis assumes all helicopter trips would occur at the new heliport. This is a conservative assumption because it concentrates the trips in a new location, which would tend to maximize the degree of difference in impacts compared with the existing condition.

Helicopter noise modeling was performed to identify the areas most affected by helicopter operations. As previously stated, helicopter operations involve medical emergencies, which could occur anytime during day or night. Figure 3.7-2 and Figure 3.7-4 provide the existing and future noise contours from heliport operations, which show that the existing and future 60 dBA L_{dn} helicopter noise contours do not and would not extend into the residential areas north of Sand Hill Road, although the future 60 dBA L_{dn} contour would just include the easternmost portion of the 1100 Welch Road apartments. However, the future increase in L_{dn} at the 1100 Welch Road apartments if all helicopter flights were shifted from the existing to the proposed heliport site would very likely be less than 1 dBA,[25] and if the existing heliport remains in service along with the proposed heliport, noise impacts at the 1100 Welch Road apartments would be even less because fewer flights would land at the new heliport.

A comparison of Figure 3.7-3 and Figure 3.7-5 shows that the exposure of the surrounding area to maximum helicopter noise at or above 85 dBA SEL would stay approximately the same as existing because the approach/departure paths of the helicopters would not change substantially with the SUMC Project. The standard noise reduction achieved by older

[25] Based on the distance between the 55 dBA contour and the 60 dBA contour, as seen in Figure 3.7-5, in comparison with the small portion of the 60 dBA contour that includes the 1100 Welch Road apartments.



Source: PBS&J, 2007.

FIGURE 3.7-4
Future Day-Night Average Sound Level (DNL) Noise Contours

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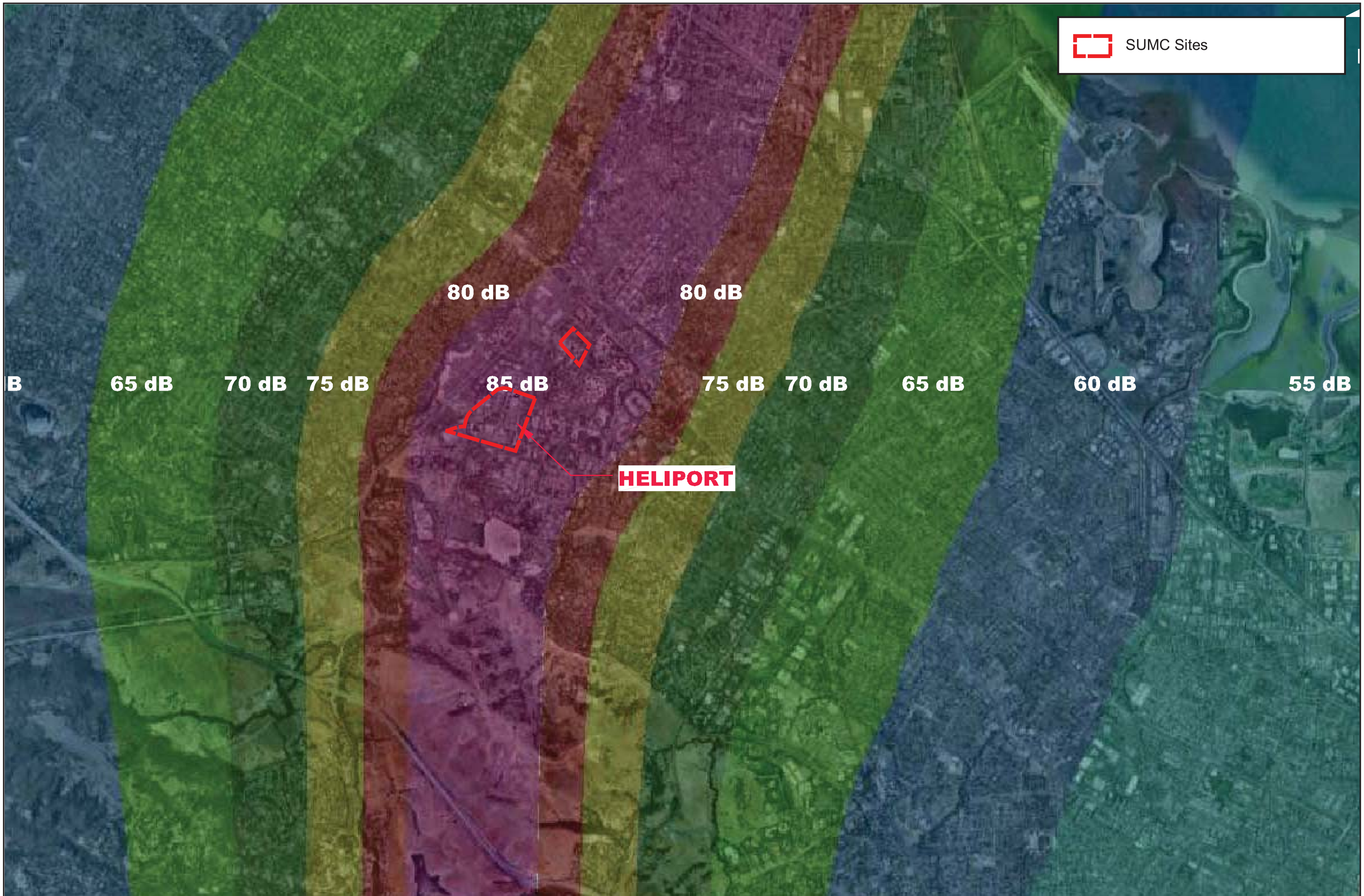

Source: PBS&J, 2007.

FIGURE 3.7-5
Future Sound Exposure Level (SEL) Contours

D41357.00

Stanford University Medical Center Facilities Renewal and Replacement Project

residential buildings is typically about 20 dBA from exterior to interior noise.[26] Therefore, it can be assumed that residences within the 85 dBA SEL contour shown in Figure 3.7-3 and Figure 3.7-5 would experience an interior noise level of 65 dBA SEL during an individual worst-case helicopter flyover. As shown in Table 3.7-3, the average probability of sleep disturbance associated with this flyover would be about two percent. Although FICAN does not specify an acceptable level of sleep disturbance from increased aircraft overflights, increased helicopter operations associated with the SUMC Project would amount to about one additional flight per day and such a single-digit increase in the sleep disturbance in surrounding residential neighborhoods could be considered insubstantial by a lead agency. Thus, the helicopter noise increase associated with the SUMC Project would have a less-than-significant impact.

It also bears noting that the City's Noise Ordinance (Section 9.10.050) exempts noise associated with "emergencies" from its standards and penalties.

Emergency Department (Ambulance) Operations. As previously stated, the ED would be expanded from 11,700 square feet to 47,892 square feet,[27] and the number of treatment spaces would be increased from 38 to 51. In 2006, there were 8,331 ground ambulance trips (23 trips per day) associated with SUMC activities. Based on this increase in size and treatment spaces, SUMC anticipates annual ED visits to increase from the current 42,522 (8,331 annual ground ambulance trips or 23 trips per day) to 72,675 (14,244 annual ground ambulance trips or 39 trips per day) by full occupancy of the hospitals.[28]

The ED relocation would reroute some of the ambulance trips coming from El Camino Real to use Sand Hill Road (east of Durand Way), in contrast to their current access route via Quarry Road (see Figure 3.7-6 and Figure 3.7-7). The other current ambulance routes (i.e., from El Camino Real via Arboretum Road, and from I-280 via Pasteur Drive/Welch Road) would not change. This route change would be motivated by the ED relocation and the new two-lane connector road, Durand Way, which would be constructed to provide alternative ambulance access from Sand Hill Road. Residential land uses, including the Stanford West Apartments, and other noise-sensitive uses, including the Hyatt Classic Residences for senior living and the Ronald McDonald House, are located along the section of Sand Hill Road between El Camino

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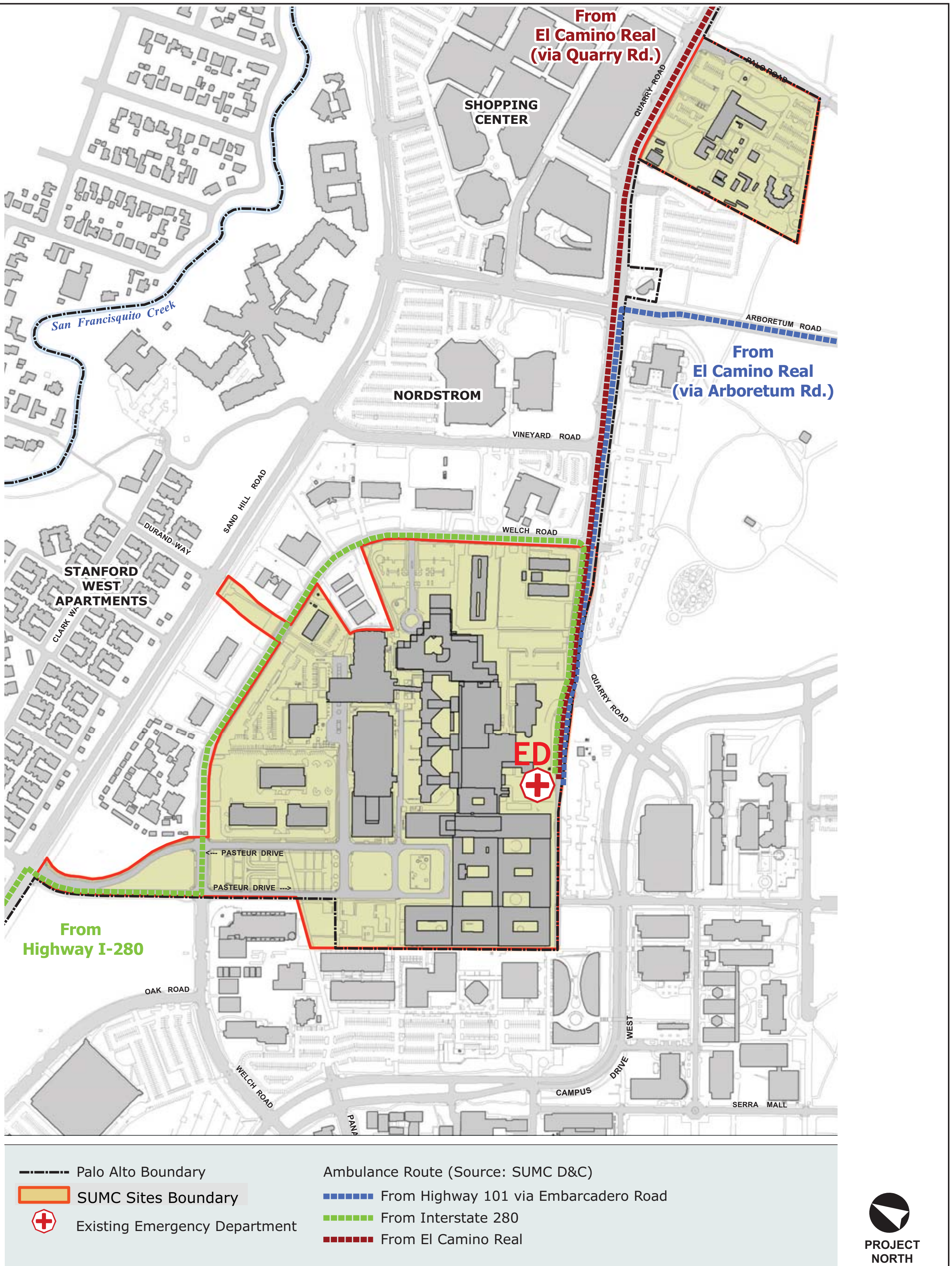
26 U.S. Department of Housing and Urban Development, http://www.hud.gov/utilities/intercept.cfm?/offices/cpd/energyenviron/environment/resources/guidebooks/noise/preface.pdf, *The Noise Guidebook,* accessed August 29, 2008.

27 The 36,192-square-foot increase in ED size includes 25,000 square feet of "right-sizing" or decompression space, which refers to expanded floor area to serve on treatment space. The right-sizing or decompression trend is typically seen in modernizing hospitals as modern treatment standards require increased floor area per bed or treatment space, compared to older hospital facilities. As such, only 11,192 square feet of the ED expansion would be associated with an increased level of operations.

28 The future estimated ambulance trips were calculated based upon the proportion of ambulance trips to emergency department visits at SHC. Ambulance trips account for 19.6 percent of total visits to the ED.

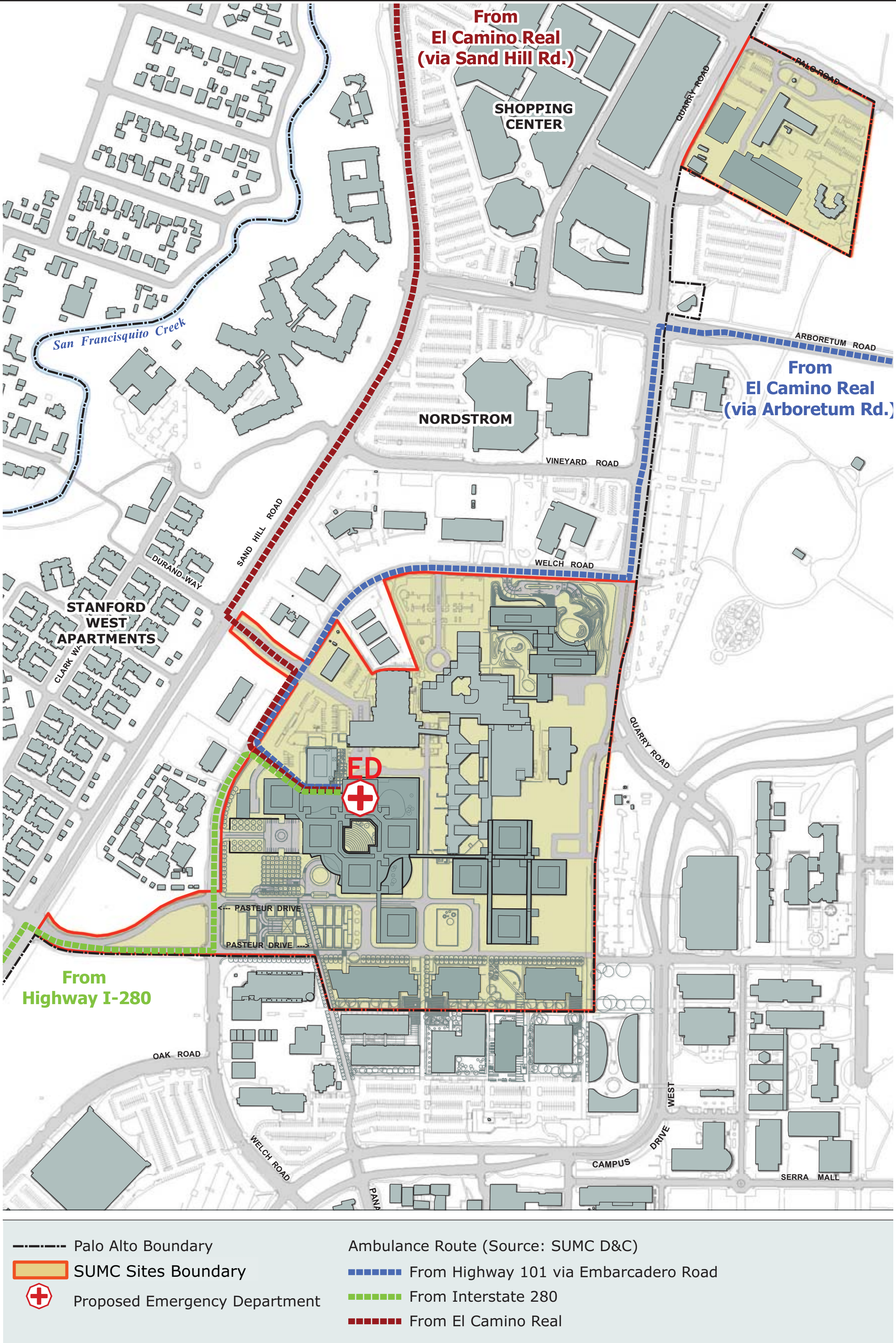


Source: SUMC, 2010.

PBS&J

FIGURE 3.7-6

Existing Ambulance Routes



Source: SUMC, 2010.

PBS&J

FIGURE 3.7-7

Proposed Ambulance Routes

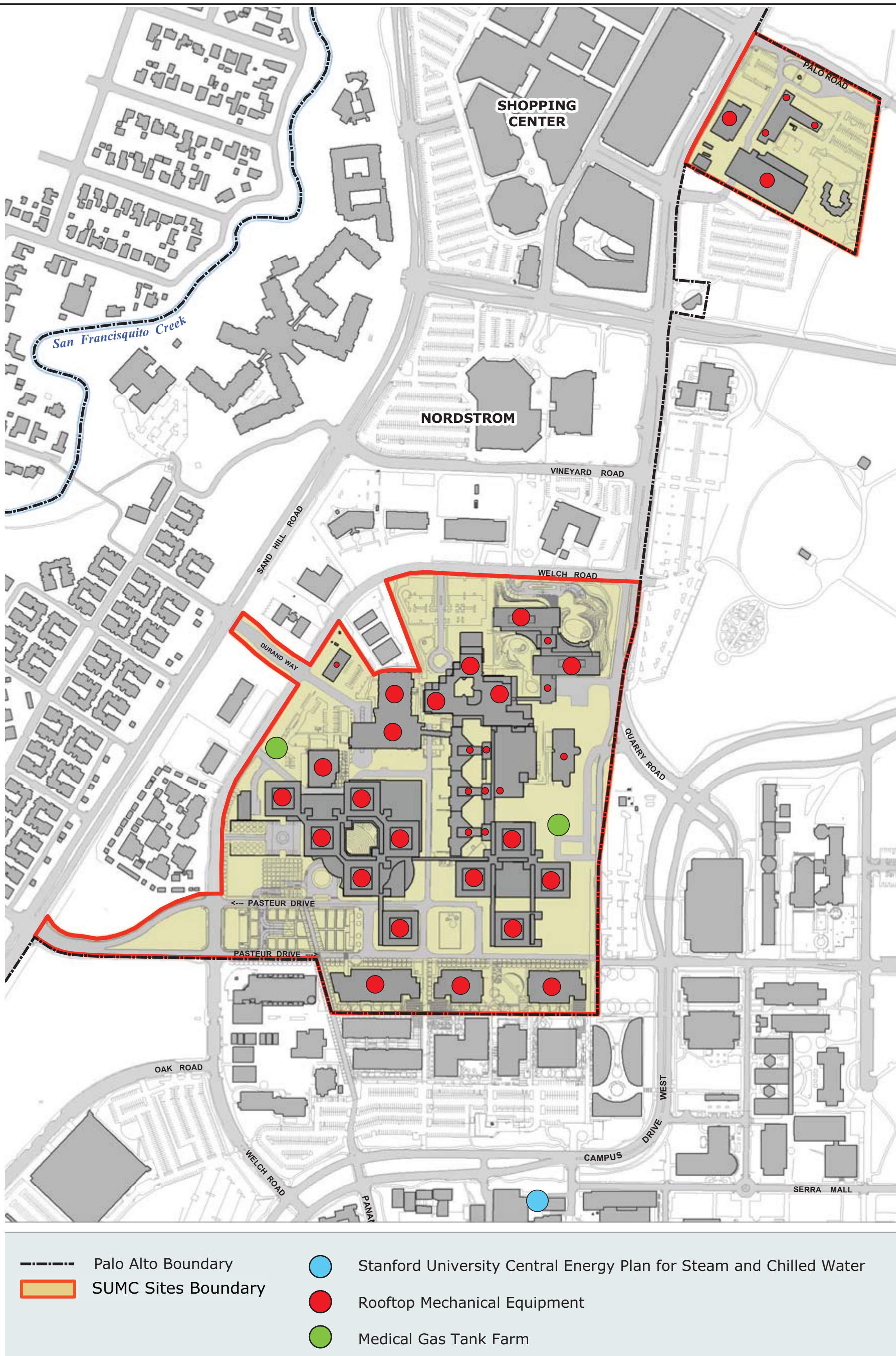
Real and Durand Way, and at one location on Welch Road (i.e., the 1100 Welch Road apartments). A typical SEL of an ambulance passby with the siren engaged, which lasts about 12 seconds, is 112 dBA with an L_{max} of about 106 dBA.

Increased ambulance operations would increase the daily average noise levels (i.e., L_{dn}) along the ambulance routes. Assuming that about one-third of the 39 daily ambulance trips could occur along this section of Sand Hill Road, and that of those trips one-tenth would use their sirens, and that about one ambulance trip per day would pass by this section of Sand Hill Road using sirens, there would be a resulting increase in L_{dn} of about 8 dBA from an existing L_{dn} of about 55 dBA at the Stanford West Apartments. It should be noted that this estimate is based on available current data, not on mandatory requirements to be placed on future ambulance access to the new ED. It is likely that more of the future ambulance trips would use the routes connecting with El Camino Real because the population density in areas along El Camino Real is higher than areas along I-280/Sand Hill Road. Also, there is no assurance that overall siren use by ambulances in the future would not change, or that there would not be substantial day-to-day variation of siren use by ambulances. As such, the "one ambulance trip per day" along the El Camino Real-Sand Hill Road route mentioned above would not be a mandatory upper bound. There could be multiple future daily ambulance siren events along this route with consequent higher siren noise increments to the noise-sensitive land uses along it.

There would be no comparable project-related ambulance noise impact at the 1100 Welch Road apartments because this portion of Welch Road is an existing ambulance route and the ambulance noise impacts would occur here regardless of whether the SUMC Project is approved. However, the Sand Hill Road ambulance noise increment would be project-related and greater than the 5 dBA increase that the Comprehensive Plan defines as the allowable limit for residential uses. As such, the increased ambulance noise along the new ambulance route on Sand Hill Road would be a significant impact.

It should be noted that while the Comprehensive Plan threshold is technically triggered, the Noise Ordinance Section 9.10.050 exempts noise associated with "emergencies" from its standards and penalties. The above analysis conservatively includes ambulance noise in the L_{dn} calculation, but recognizes that this noise source is intermittent and largely unavoidable due to the SUMC Project's relocation of the SUMC ED.

MITIGATION MEASURE. No mitigation measure (short of forbidding ambulance access to the new emergency room via the Durand Way access route; a measure that may be practically impossible given the emergency nature of ambulance activity) would prevent or reduce the identified SUMC Project-related ambulance noise impact at the noise-sensitive uses along Sand Hill Road. As such, the impact would be significant unavoidable impact. (SU)



Source: SUMC, 2010.

PBS&J

FIGURE 3.7-8
Mechanical Equipment Locations

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NO-4. Operational Stationary Source Noise Impacts. Operational stationary source noise generated by the SUMC Project could potentially increase ambient noise levels in the vicinity of the SUMC Sites and result in a significant impact. (S)

Mechanical Equipment. HVAC equipment would be installed at rooftop locations at most of the proposed buildings (see Figure 3.7-8), and emergency generators would be installed at several ground-level locations (see Figure 2-17 in Section 2, Project Description).

The noise generated by HVAC equipment can vary substantially according to the type, size, and capacity of the equipment. Benchmark noise levels were obtained from rooftop measurements of existing HVAC equipment (as included in Figure 2-17, which is assumed to be representative of the new equipment). In general, HVAC-generated noise levels, as measured near the edge of several buildings at roof-top level, ranged between the mid 60s dBA and the mid 70s dBA. Most existing HVAC equipment is completely enclosed in penthouses or surrounded by walls, a major purpose of which is to substantially reduce the intensity of the noise radiated from the equipment. Consequently, at the time noise measurement were taken, no HVAC noise was audible at on-site or off-site ground-level locations. The proposed HVAC equipment would likely achieve the same inaudible levels with proper choice of equipment and acoustical shielding.

The SUMC Project would add 13 new emergency generators (and remove two generators) to the SUMC Sites as shown in Figure 2-17 in Section 2, Project Description. Seven SHC hospital emergency generators would be located across Welch Road from existing residential receptors at 1100 Welch Road. Existing ambient noise at the Welch Road apartments was measured to be 64.7 dBA during the daytime hours (as shown in Table 3.7-4).

SUMC's existing emergency generators are typically run periodically for very limited times for equipment tests and maintenance. The new generators would likely have characteristics similar to the current models in type and size with each to be tested once per week for 30 minutes.[29] Since the SUMC, where the generators would be located, would be considered a "commercial or industrial property" for the purposes of the City Noise Ordinance, Section 9.10.040 would limit generator noise intrusions on nearby residential property to 8 dBA above local ambient. This limit could be waived under the General Daytime Exception (Section 9.10.60 (a)) if the generators did not produce noise levels exceeding 70 dBA, as measured at a 25-foot reference distance.

If generator operation would increase noise levels at the nearest residential property by the 8 dBA, as permitted by the Noise Ordinance, this would raise daytime ambient noise levels at the nearest residential property to approximately 70 dBA. While such operations would be in compliance with the Noise Ordinance, the generators would create a noticeable increase in

[29] Catherine Palter, Stanford University Land Use and Environmental Planning, Memorandum: Data Needs for SUMC Project EIR- Response #3, January 30, 2008.

noise levels at the residences, which could be a recurring annoyance to nearby residents when the generators are tested. This could be a significant noise impact.

Loading Activity. As shown in Figure 2-5, a single existing loading area, located off Quarry Road, serves SHC and LPCH at the Main SUMC Site. This existing loading area would be retained and two more would be added, as shown in Figure 2-10 in Section 2, Project Description, one to serve as a technology dock (access would be provided from the new interior driveway off of Welch Road), the other to serve the LPCH (truck access to the loading dock would be accessed via a driveway from Quarry Road, just north of Medical Drive). The demand for deliveries is closely related to the size of the hospital patient population. Approximately 50 percent of the delivery demand at full buildout would be met by trucks that would be filled to a greater capacity than they are at present. The remaining demand would be met by increased truck deliveries to the existing loading area at SHC and the new loading area at LPCH, for a total of nine daily deliveries at full buildout and occupancy. (The technology dock would be used infrequently for major equipment deliveries such as MRI equipment.)

Noise sources at loading areas may include maneuvering and idling trucks, truck refrigeration units, forklifts, banging of equipment (i.e., hand carts and roll-up doors), noise from public address systems, and voices of truck drivers and employees. The maximum noise levels of slow-moving heavy and small trucks range between 70 and 73 dBA at 50 feet. The maximum noise level associated with loading docks is typically 73 dBA at 75 feet. However, the closest residential uses (i.e., 1100 Welch Road) are more than several hundred feet to the west of any loading dock and the existing or proposed SUMC buildings would block noise propagation from the loading docks to the apartments. No matter what the noise reference level near the docks or the frequency of loading activity, there would be little potential for this noise to be audible at off-site noise-sensitive uses. As such, impacts would be less than significant.

Parking Facilities. The majority of the new parking facilities would be underground parking. Noise generated at the underground parking garages would not be audible to on-site or off-site sensitive noise receptors. The parking facility proposed near the SHC Hospital site would be an underground garage and its operation would have no noise impact on the 1100 Welch apartments, the closest off-site noise-sensitive use to the SUMC Project site. There would be one new under- and above-ground parking facility: the 1,085-space structure at the Hoover Pavilion Site. Noise from the motor vehicles using this garage would not be audible at off-site sensitive noise receptors considering the distance to off-site sensitive uses and existing local ambient levels there. As such, noise from parking facilities would be less than significant.

MITIGATION MEASURE. The following mitigation measure would reduce noise impacts to sensitive receptors from HVAC equipment and emergency generators proposed for SUMC Project. Implementation of this measure would reduce the SUMC Project's noise impacts at 1100 Welch Road. (LTS)

NO-4.1 *Shield or Enclose HVAC Equipment and Emergency Generators.* Noise levels from mechanical equipment shall be minimized to the degree required by the City Noise Ordinance by proper siting and selection of such equipment and through installation of sufficient acoustical shielding or noise emission controls. Noise levels for the emergency generators near Welch Road shall be reduced such that noise levels do not exceed the City's General Daytime Exception standard of 70 dBA at 25 feet. An acoustical analysis shall be prepared by a qualified professional to ensure that the new mechanical equipment is in compliance with noise standards of the Noise Ordinance.

Cumulative Analysis

The geographic context for cumulative impacts from localized construction and stationary source noise and vibration is the area immediately surrounding the SUMC Sites, including adjacent areas within Palo Alto and the Stanford University campus. Noise from any sources in more distant areas would not influence noise levels in geographic context. For cumulative vehicular noise impacts, the geographic context is the Transportation Impact Analysis Study Area, where traffic flows would be influenced by the SUMC Project and by other developments in the surrounding communities. No cumulative analysis is presented for helicopter or ambulance noise because no reasonably foreseeable probable future projects have been identified that would increase helicopter overflights or ambulance siren noise.

NO-5. Cumulative Construction Noise Impacts. If other foreseeable construction in the immediate vicinity of the SUMC Sites would occur simultaneously with the proposed SUMC Project construction, then significant cumulative noise impacts to adjacent residential and other noise-sensitive uses could occur. The SUMC Project's contribution would likely be cumulatively considerable. (S)

The only reasonably foreseeable probable future projects in close proximity to the SUMC Sites are: (1) approved but unconstructed development under the Stanford University CP/GUP, which would include additional academic facilities, housing units, parking, and associated utilities, roadways and bikeways in the adjacent Stanford University property; and (2) demolition of existing structures and construction of a three-story medical office building at 777 Welch Road.

Construction noise from other foreseeable projects could combine with construction noise from the SUMC Project. The Stanford University CP/GUP, includes construction of additional academic facilities, housing units, parking, and associated utilities, roadways and bikeways on the adjacent campus property. As indicated in the Stanford University CP/GUP, the Campus Center and Quarry Development Districts, which are located directly adjacent to the SUMC Sites would include 1,655,000 additional square feet of academic land uses and 350 housing units.

Also, construction noise from 777 Welch Road (see Appendix B) could combine with construction noise from the SUMC Project. Noise impacts from construction sources are relatively localized in nature because noise intensity decreases substantially with distance (i.e., by 6 dBA with each doubling of source-receptor distance). Thus, substantial cumulative construction-related noise could affect only sensitive receptors in close proximity to two or more individual project construction sites.

The nearest off-site sensitive receptors to the Main SUMC Site are 1100 Welch Road and the Stanford West Apartments. 1100 Welch Road is within 200 feet of Main SUMC Site development (the widening of Welch Road would be the nearest activity) and approximately 300 feet from the nearest potential CP/GUP construction activity. If both Main SUMC Site and CP/GUP construction proceeded simultaneously near 1100 Welch Road, the cumulative construction noise impact would likely be significant and the contribution of the SUMC Project would be cumulatively considerable.

The Stanford West Apartments are across Sand Hill Road from the SUMC Main Site and all cumulative project sites. It is at least 500 feet from the nearest SUMC Project construction site and even farther from the 777 Welch Road site. Given these distances and the intervening Sand Hill Road, no significant cumulative construction noise impact would be expected at the Stanford West Apartments.

El Camino Park is across El Camino Real from all SUMC Project and cumulative project sites. It is approximately 135 feet from the Hoover Pavilion Site. Given these distances and the intervening El Camino Real, no significant cumulative construction noise impact would be expected at El Camino Park.

As is noted under Impact NO-1 above, hospital patients would continue to use the Main SUMC Site during SUMC Project construction, and would experience some increased noise due to that construction. These patients could also experience increased noise from the nearby 777 Welch Road construction and more the distant CP/GUP project construction. The cumulative impacts at on-site receptors would be significant. The contribution of SUMC Project noise to this cumulative impact would be cumulatively considerable.

If construction activity on the Hoover Pavilion site proceeded simultaneously with construction of the HST project tracks through Palo Alto, there could be a cumulative construction noise level increase at the Hoover Pavilion Site. However, there would be no noise-sensitive receptors on this site during its construction. Also, since there are no noise-sensitive uses adjacent or very close to the Hoover Pavilion site, noise from construction on this site would be less than significant at noise-sensitive sites (mainly north of El Camino Real) where HST project construction noise levels would be highest. Thus, the cumulative noise impact between the SUMC Project and HST project would be less than significant.

MITIGATION MEASURE. Although measures under Mitigation Measure NO-1.1 would lessen the resulting noise contribution from the construction of the SUMC Project at 1100 Welch

Road and on-site receptors, the contribution of the SUMC Project construction noise would remain cumulatively considerable. (SU)

NO-6. *Cumulative Construction Vibration Impacts. Vibration during construction activities under the cumulative scenario would result in a less-than-significant cumulative impact. (LTS)*

Ground borne vibration dissipates very rapidly over distance as the energy is absorbed by the ground. Thus, high vibration levels associated with construction activities would be isolated within close proximity to the individual construction sites. Unless an SUMC Project construction site were adjacent to another construction site in Palo Alto, cumulative construction vibration impacts would be very unlikely to affect any nearby vibration-sensitive receptors. Cumulative vibration impacts would be less than significant.

NO-7. *Cumulative Operational Transportation Source Noise Impacts. Cumulative development would result in less-than-significant cumulative noise impacts. (LTS)*

Cumulative traffic volume growth in the City and in the vicinity of the SUMC Project site would increase traffic noise levels along area access roads as shown in Table 3.7-11 (in the "Increase Over Existing" column). None of these cumulative increments exceed the City 3 dBA significance criterion. It is not expected that the combined noise from the SUMC Project and HTS project would be cumulatively significant; that is; SUMC Project traffic noise would not be significant in areas close to the HST tracks, and HST noise that would combine with noise at the Hoover Pavilion Site would not be readily audible at sensitive receptors. The small increase (i.e., about one per day) in the number of medical helicopter fights to/from the SUMC heliport would not have a considerable effect on helicopter noise levels or sleep disturbance in the residential neighborhoods.

NO-8. *Cumulative Operational Stationary Source Noise Impacts. Cumulative development would not result in a significant increase in cumulative noise levels from operational stationary sources at sensitive receptors. (LTS)*

Cumulative projects would also introduce the use of stationary equipment that would increase noise levels within the immediate vicinities of those sources. Stationary (operational) noise from mechanical equipment can typically be mitigated using sound attenuation techniques. Loading activities can also be attenuated using proper circulation, delivery scheduling and sound barrier designs. It is anticipated that similar sources at other cumulative developments would also be subject to noise abatement measures, as required by existing regulations. Also, stationary noise from sources such as parking, mechanical equipment, and loading activities, is typically limited to areas in close proximity to the source. There are no other reasonably foreseeable probable future projects in the vicinity of the 1100 Welch Road apartments, the Stanford West Apartments, or El Camino Park and having stationary equipment producing noise that could cumulate with that from the SUMC Project. Thus, cumulative operational stationary source noise impacts would be less than significant.

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3.8 CULTURAL RESOURCES

Introduction

This section of the EIR assesses the SUMC Project's potential impacts on cultural and paleontological resources. The Northwest Information Center of the California Archaeological Inventory and Historical Resources Information System (at Sonoma State University) commonly classifies cultural resources in three categories: (1) prehistoric resources, (2) historical resources, and (3) Native American resources. In general, prehistoric or Native American resources can include archeological sites with evidence of village occupation, stone tool quarrying and manufacturing, and religious or ceremonial use (including cemeteries). Historical resources can include buildings, structures, objects, or sites. For example, historical homestead sites can include stone or adobe foundations or walls; structures and remains with square nails; and refuse deposits, often in old wells or privies. Paleontological resources include fossil remains, fossil localities, and formations that have produced fossil material. Paleontological resources are classified as non-renewable scientific resources that are protected by federal and State statutes, most notably by the 1906 Federal Antiquities Act. The Existing Conditions discussion in this section includes a brief historical perspective of the SUMC Sites and surrounding areas, a determination of cultural resource sensitivity within the SUMC Sites and surrounding areas, and applicable cultural resources policies and regulations for the SUMC Sites. This section concludes with a discussion of potential project impacts on cultural and paleontological resources and the appropriate mitigation measures to reduce potential impacts to less-than-significant levels. Potential impacts are assessed in accordance with the City's impact significance criteria.

This section of the EIR is based primarily on the report titled *Cultural Resources and the Stanford University Medical Center Facilities Renewal and Replacement Project*, prepared by Stanford University.[1] Other sources consulted for the preparation of this section include the cultural resources records search results for the SUMC Sites and surrounding areas prepared by the Northwest Information Center, the City of Palo Alto Comprehensive Plan, San Francisquito Creek Bank Stabilization and Revegetation Master Plan, the City of Palo Alto Master List of Historic Structures, Stanford University Medical Center Historic Resource Evaluation and Peer Review, Staff Comments on the Stanford University Medical Center: Historic Resource Evaluation and Peer Review California Archaeology, Existing Conditions Report: Stanford West Senior Housing, Sand Hill Road, Stanford Shopping Center, and geologic maps.

Cultural resource issues and comments identified in response letters to the NOP and during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project were considered in preparing this analysis. Comments primarily pertained to impacts on Governor's Lane, the Edward Durell Stone Building (also referred to as the Stone Building complex),

[1] Jones, L., *Cultural Resources and the Stanford University Medical Facilities Renewal and Replacement Project,* 2007.

and the Hoover Pavilion. These comments were received from the Palo Alto Planning and Transportation Commission. This analysis addresses the historic significance of these resources and the impacts of the SUMC Project on these resources.

Existing Conditions

The geologic units identified in the SUMC Sites and surrounding areas are part of a younger alluvial deposit found along the edge of the Santa Clara Valley, and consist of 12 to 15 feet of moderately well-sorted, unconsolidated, fine sandy silt to clayey silt overlying at least 6 feet of silty clay.[2] Underlying this, the Santa Clara Formation is an older alluvium consisting of partially consolidated clay, silt, sand, and gravel deposited more than 11,000 years ago.[3] Neither of these geologic units is considered sensitive for paleontological resources. Although the area is considered to have a low sensitivity based on the geologic units, previous construction activities in the SUMC Sites and surrounding areas have uncovered paleontological resources as well as a Pleistocene creek bed that is known to contain fossils. Paleontological resources that have been found in the area include a large mastodon tusk in the bank of San Francisquito Creek, the upper limb of a giant bison, and individual skeletal elements.[4] In addition, one of the best-preserved and complete specimens of a Paleoparadoxia ("sea cow") outside of China was discovered near the SLAC National Laboratory to the west of the SUMC Sites.

Surrounding Areas

Prehistory. The SUMC Sites are within the San Francisco Bay Area region. A review of the extant archaeological record by Moratto[5] shows no evidence of Paleo-Indian (pre-9000 B.C.) habitation in the region, though just to the north the record goes back much further in time. The earliest evidence in the region dates to the Late Archaic (4000 to 2000 B.C.). A Stanford University student found a skull eroding out of the bank of San Francisquito Creek in 1921, located 6.1 meters (approximately 20.1 feet) below the surface in primary context. Named the Stanford Man I, it was dated in 1974 to 3130 $\pm$ 70 B.C. In 1963, Stanford Man II, a flexed human burial, was discovered 1,150 meters (approximately 1,265 yards) downstream from Stanford Man I. It was dated to 2400 $\pm$ 70 B.C.[6,7]

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2 Site observations, PBS&J geologist, 1981 through 2007.

3 a) Helley, E.J., et al., *Flatland Deposits of the San Francisco Bay Region, California*. Washington, D.C., United States Geological Survey, Professional Paper 943, 1979, Scale 1:125,000, Plate 3.
b) Brabb, E.E., *Preliminary Geologic Map of the Central Santa Cruz Mountains, California*. Menlo Park, California, United States Geological Survey Open File Map 70-36, 1970. Scale 1:63,500, Sheet 1.
c) Pampeyan, E.H., *Geologic Map of the Palo Alto 7.5 Minute Quadrangle*, Menlo Park, California, United States Geological Survey Open File Report, 1970. Scale 1:24,000.

4 Section 4.9 Historic and Archaeological Resources. *Stanford University Community Plan/General Use Permit EIR*. June 2000.

5 Moratto, J., 2004, California Archaeology. Coyote Press, Salinas, California. Originally published 1984 Academic Press, Orlando, Florida.

6 EIP Associates, 1993, Existing Conditions Report: Stanford West Senior Housing, Sand Hill Road, Stanford Shopping Center. Report prepared for City of Palo Alto, p. 3.11-1.

7 Moratto, J., 2004, California Archaeology. Coyote Press, Salinas, California. Originally published 1984 Academic Press, Orlando, Florida.

The Late Archaic was a time of great change throughout California, with prehistoric groups expanding their range of exploited environments and resources. In the San Francisco Bay region, the evidence gathered at sites along San Francisquito Creek, and other areas, point to a widespread but sparse population.[8] Important technological innovations during the Archaic period in general, and the Late Archaic in particular, include the mortar and pestle (used for pounding nuts, acorns, and the carcasses of small animals), the milling stone and mano (primarily used for grinding hard seeds), and, very late during the Archaic, mortars and milling surfaces placed on bedrock (BRMs). Hunting and fishing was also very important as evidenced by the presence of pronged spears, nets, hooks, and traps. A variety of knives, projectile points (spear and dart points), and scrapers were also made. Most of these were made from local materials, but some were made from very distant source materials, likely evidence of long distance trade. Basketry was one of the most important innovations during the Archaic period, and California Indians are counted among the most skilled basket makers in the world. A few uses of baskets include cooking, serving, storing, and transport; some baskets were made so well they could hold water.[9]

The ensuing period was a time of increasing use of varied resources and ecological niches. Throughout California, prehistoric groups were becoming more diverse as they increasingly adapted to their particular environments. In the San Francisco Bay region, it has been suggested that Ohlone peoples from eastern Contra Costa County settled the region during this time, replacing the previous group by 1500 B.C.[10] The Ohlone would remain in place until historic times.

By 300 A.D., this group would adopt the bow and arrow, and develop other traits such as tubular tobacco pipes, cremation of the dead, intensive acorn utilization, and complicated exchange systems. It was this pattern that was destroyed by the Spanish Mission system.[11]

Ethnographic Setting. At the time of European contact, the SUMC Sites and surrounding areas were occupied by a group of Native Americans referred to as the Costanoan or Ohlone. The Ohlone are a linguistically defined group composed of several autonomous tribes speaking eight different but related languages. The Ohlone languages, together with Miwok, comprise the Utian language family of the Penutian stock. The territory of the Ohlone people extended along the coast from San Francisco Bay in the north to just beyond Carmel in the south, and as much as 60 miles inland. This territory encompasses a lengthy coastline as well as several inland valleys. The Ohlone were hunter-gatherers and relied heavily on plants and seafood, as well as various seeds, buckeye, berries, roots, land and sea mammals, waterfowl, and shellfish.

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8 EIP Associates, 1993, Existing Conditions Report: Stanford West Senior Housing, Sand Hill Road, Stanford Shopping Center. Report prepared for City of Palo Alto, p. 3.11-1.

9 Chartkoff, J.L. and K.K. Chartkoff, 2004, The Archaeology of California, Stanford University Press, Stanford, California.

10 Moratto, J., 2004, California Archaeology. Coyote Press, Salinas, California. Originally published 1984 Academic Press, Orlando, Florida.

11 Chartkoff, J.L. and K.K. Chartkoff, 2004, The Archaeology of California. Stanford University Press, Stanford, California.

Ohlone technology that aided in the procurement and processing of foodstuffs included tule balsas for watercraft, bow and arrow, cordage, bone tools, and twined basketry.

The Ohlone were politically organized by tribes, with each tribe having a designated territory. A tribe consisted of one or more villages and camps within a territory designated by physiographic features. The position of tribe chief was inherited patrilineally and could be occupied by a man or a woman. Duties of the chief included hosting visitors, directing ceremonial activities, and directing fishing, hunting, gathering, and warfare expeditions. The chief served as the leader of a council of elders, which functioned primarily in an advisory capacity to the community.

Seven Spanish missions were founded within the Ohlone territory between 1790 and 1797. While living within the mission system, the Ohlone commingled with other groups, including Esselen, Yokuts, Miwok, and Patwin. Mission life was detrimental to the Ohlone population. It has been estimated that in 1770, at the time the first mission was established in Ohlone territory, the population numbered around 10,000 individuals. The population declined to less than 2,000 by 1832 as a result of violence, starvation, slavery, disease, and reduced birth rates. After the secularization of the missions, Indian inhabitants of the missions gradually left, and many went to work as manual laborers on ranchos. There was a partial return to aboriginal religious practices and subsistence strategies, but Ohlone culture was dramatically transformed after European settlement in the region.[12]

History. Beginning in the mid-sixteenth century, Spanish explorers conducted a series of sea expeditions along the coast of California. It was not until 1769, however, that Europeans became aware of the existence of the San Francisco Bay. In 1769, Juan Manuel de Ayla, the first European to enter the San Francisco Bay, established a settlement along its shores. In 1776, Juan Bautista de Anza led the first overland expedition into San Francisco, where he founded the Presidio of San Francisco and Mission San Francisco de Asís.

The Spanish colonization of California was achieved through a program of military-civilian-religious conquest. Under this system, soldiers secured areas for settlement by suppressing Indian and foreign resistance and established fortified structures (presidios) from which the colony would be governed. Civilians established towns (pueblos) and stock-grazing operations (ranchos) that supported the settlement and provided products for export. The missionary component of the colonization strategy was led by Spanish priests, who were charged with converting Indians to Catholicism, introducing them to the benefits of Spanish culture, and disciplining them into a productive labor force. Ultimately, four presidios and 21 missions were established in Spanish California between 1769 and 1821. The mission trail became known as the El Camino Real, or King's Highway, which today runs through Palo Alto and is just north of the Hoover Pavilion Site.

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[12] Levy, R. 1978. Costanoan. Pages 485–495 in R.L. Heizer (ed.), Handbook of North American Indians, Volume 8, California. Washington, D.C.: Smithsonian Institution.

In 1822, after more than a decade of revolutionary struggle, Mexico achieved independence from Spain, and California became a distant outpost of the Mexican Republic. Under a law adopted by the Mexican congress in 1833, the mission lands were to be subdivided into land grants, or ranchos, to be sold to trustworthy citizens. The rancho economy was based primarily on stock raising for the hide and tallow trade. Cattle were driven to coastal locations where they were slaughtered and skinned; the hides and tallow (a product made from animal fat and used to make soap and candles) were then processed for transport to awaiting trade ships.

The absence of effective governmental authority in Mexican California invited infiltration by outsiders. As early as the 1820s, British and American mountain men, fur traders, and entrepreneurs were venturing into California in search of fortune. The Mexican government was unable to halt the incursion and granted citizenship to foreigners who pledged to adhere to Mexican law. Many of the foreigners received generous land grants on which they established grazing and commercial operations. Beginning in the early 1840s, Mexico's hold on California was further threatened by the steady overland migration of American settlers into the region. The increased American presence in California was a product of the expansionist impulse that had come to dominate the American imagination and which contributed to a deterioration of relations between Mexico and the United States. War between the U.S. and Mexico broke out in May 1846, but the U.S. eventually prevailed, and the American victory over Mexico was formalized in February 1848 with the Treaty of Guadalupe Hidalgo.

In January 1848, just a few days before the treaty was signed, James Marshall, an employee of John Sutter, discovered gold on the American River. Marshall's discovery triggered the gold rush, a massive influx of fortune-seekers into California. The sudden and enormous growth of California's population brought about by the gold rush resulted in a movement for statehood that culminated in the state constitutional convention at Monterey in 1849 and the establishment of California as a state in 1850.[13]

Though no significant gold mining activity took place in Santa Clara County, the gold rush led to an exodus of much the adult male population to the gold fields of the central Sierra mountain range. By 1852, the most accessible gold diggings had been exhausted, and most of the immigrants that had come to California in search of instant riches began to redirect their energies to agricultural and commercial development. During the two decades that followed the gold rush, California's urban and agricultural infrastructure grew steadily as migration into the state continued. The City of Palo Alto in Santa Clara County was founded in 1892 and lies on the historic land grants *Rancho Rincón de la San Francisquito*, *Rancho de la Arroyo de San Francisquito*, and *Rancho San Francisquito*.

The SUMC Sites lie in a plain that was once oak woodland and grassland. The area is situated between the marshes of the San Francisco Bay and the foothills of the coastal range. The early landowners of the SUMC Sites and surrounding area were George and Elizabeth Gordon. Their home was located along the San Francisquito Creek. The family planted vineyards in the general vicinity of the Stanford

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13 Rice, R. B., William A. Bullough, and Richard J. Orsi, The Elusive Eden: A New History of California, 2nd ed, McGraw-Hill, New York, 1996.

Shopping Center. In 1876, Leland and Jane Stanford purchased 650 acres of the *Rancho San Francisquito* (the Gordon Estate), where Stanford built a country home and began developing his famous Palo Alto Stock Farm for trotting horses. In the 1880s, the vineyard was expanded and a winery was constructed. He later acquired several thousand more acres of property, on which he built Stanford University.[14]

Located near the edge of the Stanford University campus, the SUMC Sites continued to be used for agricultural until the 1950s, when Stanford University decided to move its medical school from San Francisco to the Palo Alto campus. The new medical complex opened in 1959. A comprehensive history of the SUMC Sites and surrounding areas is provided in *Cultural Resources and the Stanford University Medical Center Facilities Renewal and Replacement Project,* which is available upon request from the City.

Site Investigations. The following investigations were conducted to assess occurrence of cultural resources within the SUMC Sites and surrounding areas.

NWIC Records Search. A records search was conducted by the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS). The records search included a review of NWIC data maps, historic-period maps, and literature for Santa Clara County on file at the NWIC. The records searches for the SUMC Project were conducted on October 4, 2007 and January 10, 2008, at the NWIC. The records search failed to identify any recorded Native American or historic-period archaeological resources within the SUMC Sites.[15,16] The NWIC has no record of any archaeological studies within the SUMC Sites; however, the Main SUMC Site is about 0.25 miles south of San Francisquito Creek, an area known to contain Native American cultural resources.

There were multiple studies associated with the Sand Hill Road Corridor Projects that included Quarry Road. The Draft EIR for the Stanford Sand Hill Road Corridor Projects analyzed projects that were located near the northern boundary of the City of Palo Alto, on the campus of Stanford University adjacent to San Francisquito Creek and the City of Menlo Park. Thirteen known prehistoric archaeological sites were identified within the projects' boundaries. A reconnaissance-level survey was conducted by William Self Associates of the Stanford West Apartments Project, the Stanford West Senior Housing Project, and the Sand Hill Road Project. At the Stanford West Apartments, sparse artifacts, both prehistoric and historic, were observed throughout the area. At the Stanford West Senior Housing project, no prehistoric cultural resources were encountered during the reconnaissance survey; however, records indicate that three archaeological sites were recorded within or immediately adjacent to Stanford West Senior Housing along San Francisquito Creek. In addition, an historic stone

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14 Hoover, M. B., H. E. Rensch, E. G. Rensch, and W. N. Abeloe, Historic Spots in California, 4th ed, Revised by Douglas E. Kyle, Stanford University Press, Stanford, 1990.

15 Jillian E. Guldenbrein, Researcher, Northwest Information Center, Sonoma State University, letter to PBS&J, re: Rapid Response Records Search Results for the proposed Simon-Properties Stanford Shopping Center Expansion project (File No: 07-511A), October 4, 2007.

16 Jillian E. Guldenbrein, Researcher, Northwest Information Center, Sonoma State University, letter to PBS&J, re: Rapid Response Records Search Results for the proposed Stanford University Medical Center Facilities Renewal and Replacement project (File No: 07-511B), October 4, 2007.

monument and an historic landscape feature were recorded. Although three archaeological sites were identified within or in the Sand Hill Road Project Area no cultural resources were encountered during their survey of related roadways or of the Sand Hill Road Project. Given the proximity of San Francisquito Creek to the project, it was concluded that construction related to the Sand Hill Road Extension, Vineyard Lane, Stock Farm Road extension, Pasteur Drive realignment, and Stanford Golf Course modifications could encounter archaeological resources. It was determined that this would be a potentially significant impact. In addition, an archaeological deposit is known to exist in and near the Sand Hill Road bridge. It was determined that the proposed widening of the bridge would disturb these archaeological deposits, which was determined to be a significant impact.

The 1984 Willow Road Extension Draft Environmental Impact Report identified CA-SMa-33 as located on the southeast bank of San Francisquito Creek. The search also identified one previous survey along Willow Road. A reconnaissance-level survey was conducted; however, no cultural resources were encountered. Due to the presence of nearby buried archaeological resources, it was decided to perform subsurface testing, which consisted of 11 mechanically excavated trenches along the proposed Willow Road alignment. A single trench showed probable evidence of archaeological resources, yielding eight pieces of fire-cracked rock, baked clay, and charcoal.

The Willow Road Improvement Project Draft Environmental Impact Report analyzed the widening of Willow Road from the Sand Hill-Santa Cruz intersection to Arboretum Road and the extension of Willow Road from Arboretum Road to El Camino Real. Archaeologists examined areas outside and to the west of the current SUMC Sites. Dirt from rodent holes were examined at the Stanford golf course, and the area north of the golf course was surveyed. In addition, soil cores were taken from the golf course. A complete Monterey chert projectile point, two obsidian projectile point fragments, and disarticulated human remains were recovered. All of the soil cores contained varying amounts of cultural material, including waste flakes, shellfish, crab, and fire-affected rock.

Project Specific Investigations/Reports. Cultural resource reports prepared for the EIR included *Cultural Resources and the Stanford University Medical Center Facilities Renewal and Replacement Project* prepared by Stanford University in 2007 and *Stanford University Medical Center Historic Resource Evaluation and Peer Review* prepared by Architectural Resources Group, Inc. in 2008 (see Appendix I). The report prepared by Stanford University provides the history, setting, and evaluations of all potential historical resources within the SUMC Sites. This report was prepared by Laura Jones, Director of Heritage Services and University Archaeologist at Stanford University. The report prepared by ARG includes a peer review of the report prepared by Stanford University's Director of Heritage Services and University Archaeologist Cultural Resource Specialist. A further discussion of historical resources within the SUMC Sites is provided later in this section.

Native American Consultation. The Native American Heritage Commission (NAHC) in Sacramento was contacted by PBS&J on October 9, 2007 by letter with a description of the SUMC Project and a request for a listing of local, interested Native American representatives and information on traditional or sacred lands within the SUMC Sites and surrounding area. The search performed by the NAHC of the sacred land file did not identify the presence of recorded Native American sacred sites in the SUMC Sites.[17] The NAHC also provided a list of Native American individuals/organizations that may have knowledge of cultural resources in the SUMC Sites. Letters that included a brief description of the SUMC Project and a project location map were sent to each individual/organization identified on the NAHC list, who are listed in Table 3.8-1. The NAHC requests that follow-up phone calls be made to these Native American individuals/organizations if they do not respond to the letters. Follow-up telephone calls were made by PBS&J on December 27, 2007. As shown in Table 3.8-1, Michelle Zimmer, Irene Zwierlein, and Ann Marie Sayers recommended that an archaeologist and Native American monitor earth-disturbing activities; the other Native American individuals/organizations could not be reached.

Table 3.8-1
Native Americans Contacted

Name and Affiliation	Method of Consultation	Date of Consultation	Response
Jakki Kehl Ohlone/Costanoan	Letter Telephone	November 15, 2007 December 27, 2007	None
Michelle Zimmer, CR Coordinator Amah/Mutsun Tribal Band	Letter Telephone	November 15, 2007 December 27, 2007	Recommends an archaeologist and Native American monitor earth-disturbing activities.
Irene Zwierlein, Chairperson Amah/Mutsun Tribal Band	Letter Telephone	November 15, 2007 December 27, 2007	Recommends an archaeologist and Native American monitor earth-disturbing activities.
Ann Marie Sayers, Chairperson Indian Canyon Mutsun Band	Letter Telephone	November 15, 2007 December 27, 2007	Recommends an archaeologist and Native American monitor earth-moving activities.
Rosemary Cambra, Chairperson Muwekma Ohlone Indian Tribe of the SF Bay Area	Letter Telephone	November 15, 2007 December 27, 2007	None
Andrew Galvan Ohlone Indian Tribe	Letter Telephone	November 15, 2007 December 27, 2007	None
Ramona Garibay, Representative Trina Marine Ruano Family	Letter Telephone	November 15, 2007 December 27, 2007	None

Source: PBS&J, 2008.

Cultural Resource Sensitivity. The NWIC records search revealed no recorded prehistoric or historic-period sites or features in the SUMC Sites. The NWIC concluded that there is a moderate to high likelihood that Native American cultural resources exist on a portion of the areas surrounding the SUMC Sites due to environmental conditions that may have been favorable to Native Americans. The search of the NAHC sacred lands database and Native American correspondence failed to indicate the presence of Native American resources in the immediate SUMC Sites. The NAHC indicated that the

[17] Debbie Pilas-Treadway, Environmental Specialist III, Native American Heritage Commission, letter to PBS&J, re: Proposed Stanford University Medical Center Facilities Renewal and Replacement project, October 9, 2007.

absence of specific site information in the sacred lands database or through correspondence with tribal representatives does not indicate the absence of cultural resources on the SUMC Sites.

Research has revealed that several important archaeological resources have been discovered along and in the banks of San Francisquito Creek, about 0.25 miles north of the Main SUMC Site. Many of these resources were discovered several feet below the surface. Surveys of the SUMC Sites and surrounding areas by Stanford University archaeologists have discovered several archaeological sites immediately adjacent to San Francisquito Creek. All of the documented prehistoric archaeological resources are restricted to the creek vicinity and a 300-foot area that extends away from the creek. In these areas there are dense archaeological remains, including village sites and burials.[18] Outside of this zone, prehistoric cultural resources have not been encountered. The SUMC Sites are entirely outside of this archaeological zone.

Paleontological Resources. Although a review of the Geologic Map of California suggests that there is no fossil potential for the SUMC Sites,[19] the Bay Area in general is rich in paleontological resources. A buried Pleistocene stream bed is under the Main SUMC Site. The stream bed has been encountered in at least three locations: the Lucas Center, the Neiman Marcus store, and the storm drain at Quarry Road near El Camino; however, the precise location of the stream bed is unknown. As previous construction activities have shown that this creek bed contains paleontological resources, the excavation of trenches that are at least 100 feet in length[20] and 15 feet in depth could expose the buried Pleistocene-era stream channel and intact skeletons of extinct species. Other important finds recovered in the vicinity of the SUMC Sites include mastodon tusk, fragments of petrified mastodon and/or dinosaur bone, isolated fragments of bones from late Pleistocene mammals, and marine fossils. In addition, one of the best-preserved and complete specimens of a Paleoparadoxia ("sea cow") outside of China was discovered near the SLAC National Laboratory to the west of the SUMC Sites. Given the presence of the buried Pleistocene stream in the vicinity of the SUMC Sites and the discovery of important finds recovered in or near the SUMC Sites, it is possible that paleontological resources would be encountered.[21]

In summary, the findings indicate a high sensitivity for paleontological and historic archaeological cultural resources within the vicinity of the SUMC Sites, with a low sensitivity for archaeological cultural resources throughout most of the vicinity of the SUMC Sites.

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18 Laura Jones, Director, Heritage Services and University Archaeologist, personal communication, January 3, 2008.

19 Jennings, C. W., 1977, Geologic Map of California, 1:750,000, California Division of Mines and Geology, Sacramento.

20 One hundred feet or a sufficient length to support detailed hydrological study that could identify the Pleistocene-era stream channel

21 Jones, L. Director, Heritage Services and University Archaeologist, personal communication, January 3, 2008.

SUMC Sites

The following descriptions and significance assessments were taken from the historical resources reports prepared by Stanford University in 2007 and Architectural Resources Group, Inc. in 2009 (see Appendix I). Seven potential resources within the SUMC Sites were evaluated: Governor's Avenue, Hoover Pavilion, Nurse's Cottage at Hoover Pavilion, 701 Welch Road, 703 Welch Road, 1101 Welch Road, and the Stone Building complex (including the East, West, Core, Boswell, Grant, Alway, Lane, and Edwards buildings). Each of the buildings that are within the SUMC Sites is described briefly below. Each resource was evaluated using the standards for eligibility for listing on the California Register of Historical Resources (CRHR) and the National Register of Historic Places (NRHP). Part of the evaluation process includes determining if the resource maintains integrity. The seven elements of integrity identified by the National Park Service include location, design, setting, materials, workmanship, feeling, and association.[22]

Governor's Avenue. Governor's Avenue (or Governor's Lane) was a tree-lined drive originally planted by Governor Leland Stanford, Sr. between 1876 and 1878. The drive started at his carriage house, continued along San Francisquito Creek, and ended at the Palo Alto Stock Farm. The drive originally was lined with more than 700 Tasmanian blue gum eucalyptus trees. Intact portions of Governor's Avenue are considered to be a significant historical resource. Within the boundary of the SUMC Sites, however, most of Governor's Avenue is absent.

In evaluating Governor's Avenue, Stanford University's Director of Heritage Services and University Archaeologist considered if the resource is eligible for listing on the CRHR, under criteria 1, 2, or 3 (see Applicable Plans and Regulations later in this section for the CRHR criteria). Stanford University's Director of Heritage Services and University Archaeologist concluded that the resource does not appear eligible for listing under criterion 1 for association with events at the Palo Alto Stock Farm. In addition, while the resource is associated with Leland Stanford, the resource is not representative of his many achievements as governor, railroad magnate, and philanthropist. Finally, Stanford University's Director of Heritage Services and University Archaeologist evaluated the resource as a fine example of a type of designed landscape. It was determined that the resource exhibits most of the characteristic features of 19th century avenues: evenly spaced trees of similar size and type, a consistent roadway width, and strong straight lines. It was also determined the intact portions of the avenue retain integrity, and Governor's Avenue appears to be eligible for listing on the CRHR under criterion 3.[23]

Two segments of Governor's Avenue run within the Main SUMC Site, west of Pasteur Drive and adjacent to Welch Road. ARG agreed that some segments of Governor's Avenue may have historic significance; however, ARG found that the segments in the Main SUMC Site does not retain sufficient integrity to be a contributing part of this resource. While the integrity of location has been retained,

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[22] National Park Service How to Apply the National Register Criteria for Evaluation. National Register Bulletin 15. National Park Service, Washington, D.C. 1991.

[23] Jones, L., Cultural Resources and the Stanford University Medical Facilities Renewal and Replacement Project, 2007.

other original aspects of the Avenue, including the design, setting, materials, workmanship, and feeling of the resource, have been lost. ARG concluded that the segments of Governor's Avenue within the Main SUMC Site would not be eligible for listing in the CRHR or NRHP.[24]

In reviewing Stanford University's and ARG's evaluations, the City of Palo Alto's Historic Preservation Planner concurred with the finding that Governor's Avenue does not meet the criteria for listing on the CRHR.[25] Therefore, within the SUMC Sites, the Governor's Avenue resource is not considered to be an historical resource for purposes of the City's CEQA analysis.

Hoover Pavilion. The Hoover Pavilion, along Quarry Road near El Camino Real, was constructed in 1930 to house the Palo Alto Hospital. Additions to the hospital were completed in 1939. The building is L-shaped in plan with a five-story central block, six-story tower, and four-story wings. It is Art Deco in style, which is represented in the ziggurat form, vertical emphasis of window bays, and stylized floral and geometric terra cotta panels and fixtures.

Stanford University's Director of Heritage Services and University Archaeologist evaluated the Hoover Pavilion for listing on the CRHR. It was concluded that the Hoover Pavilion is not associated with significant events or persons, and therefore is not recommended eligible for the CRHR under criteria 1 or 2. However, it was concluded that the building is recommended eligible for listing under criterion 3 as an important example of pre-World War II hospital design. The building was considered a high-rise at the time of its construction. Its ziggurat roofline is strongly associated with art deco. The Hoover Pavilion may be the only ziggurat profile building in Palo Alto, and is one of a few examples of art deco structures in the City. In regards to the resource's integrity, the Stanford University report stated that although decades of interior remodeling have compromised the feeling of being inside an historic hospital, the exterior art deco features and original building materials are intact, and convey a fairly high level of integrity. The Hoover Pavilion meets the condition of criterion 3 as exemplifying the distinctive characteristics of a pre-World War II hospital and appears to maintain sufficient integrity for listing on the CRHR.[26]

ARG concurred with Stanford's conclusion that the Hoover Pavilion appears eligible for listing on the CRHR under criterion 3. ARG also stated that an evaluation of the Hoover Pavilion conducted by Dames and Moore found the resource to be eligible for the NRHP under criteria A and C.[27]

The City of Palo Alto's Historic Preservation Planner concurs with Stanford University's and ARG's evaluations of the Hoover Pavilion. In addition, although the art deco fountain near the main Hoover

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24 Architectural Resources Group, Inc., Stanford University Medical Center Historic Resource Evaluation and Peer Review, 2009.

25 Dennis Backlund, Historic Preservation Planner, City of Palo Alto, Staff Comments on the Stanford Shopping Center and University Medical Center: Historic Resource Evaluation and Peer Review, prepared by Architectural Resources Group, Inc., memorandum to Julie Caporgno, Chief Planning and Transportation Official, and Steven Turner, Advance Planning Manager, May 15, 2008.

26 Jones, L., Cultural Resources and the Stanford University Medical Facilities Renewal and Replacement Project, 2007.

27 Architectural Resources Group, Inc., Stanford University Medical Center Historic Resource Evaluation and Peer Review, 2009.

Pavilion entry does not appear in photographs or plans from the 1930 or 1939 construction, the City of Palo Alto's Historic Preservation Planner finds the fountain, which can be seen in an aerial photograph of 1947, to be a significant related landscape feature.[28] Therefore, the Hoover Pavilion is considered to be an historical resource for purposes of the City's CEQA analysis.

Nurses' Cottage at the Hoover Pavilion. The Nurses' Cottage is a multiple-level building with an irregular footprint. Palo Alto architects Birge Clark and David Clark designed the building in 1941. Birge Clark and Walter Stromquist designed the 1948 addition to the building.

The Stanford University report concluded that the Nurses' Cottage is not associated with any significant historic events, and that none of the former occupants achieved notoriety. Lucie Stern, a well-known local philanthropist financed the construction of the cottage. Mrs. Stern contributed to the construction of other, better known properties in Palo Alto. The Nurses' Cottage does not have a strong association with Mrs. Stern, nor is it one of her major contributions to Palo Alto and Stanford. Therefore, it does not appear to be eligible for the CRHR under criteria 1 or 2. The Nurses' Cottage was designed by Palo Alto architects Birge Clark and David Clark in 1941. The property is a modest building, and is not an example of Clark's well-known Spanish colonial revival style that characterizes many of his other projects in Palo Alto. Therefore, the Nurses' Cottage does not appear eligible for the CRHR under criterion 3, and does not appear to be a significant historical resource. The Stanford University report did not evaluate the integrity of the Nurses' Cottage, since the building is not considered eligible for the CRHR.[29] Based on the information presented in the Stanford University report, ARG concurred with Stanford University's findings and recommendation.[30]

The City of Palo Alto's Historic Preservation Planner concurs with Stanford's and ARG's evaluations, stating that the general style of the building appears too understated to meet the eligibility criteria for listing on the CRHR.[31] Therefore, it is not considered to be an historical resource for purposes of CEQA analysis.

701 Welch Road, Whelan Building. This complex consists of five buildings – four of which were built between 1957 through 1961. An elevator tower was built in this complex in 1998. The four original buildings were designed by architect Don Knorr and range from one to three stories and form a "U" shape around a sunken central courtyard. The buildings' architectural elements are typical of

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28 Dennis Backlund, Historic Preservation Planner, City of Palo Alto, Staff Comments on the Stanford Shopping Center and University Medical Center: Historic Resource Evaluation and Peer Review, prepared by Architectural Resources Group, Inc., memorandum to Julie Caporgno, Chief Planning and Transportation Official, and Steven Turner, Advance Planning Manager, May 15, 2008.

29 Jones, L., *Cultural Resources and the Stanford University Medical Facilities Renewal and Replacement Project*, 2007.

30 Architectural Resources Group, Inc., Stanford University Medical Center Historic Resource Evaluation and Peer Review, 2009.

31 Dennis Backlund, Historic Preservation Planner, City of Palo Alto, Staff Comments on the Stanford Shopping Center and University Medical Center: Historic Resource Evaluation and Peer Review, prepared by Architectural Resources Group, Inc., memorandum to Julie Caporgno, Chief Planning and Transportation Official, and Steven Turner, Advance Planning Manager, May 15, 2008.

the International Style and consist of the flat roof, use of glass and steel, skeleton-frame construction, and lack of nonessential decoration.

Stanford University's Director of Heritage Services and University Archaeologist concluded that there are no historical events associated with the buildings that would make the structures eligible for listing on the CRHR under criterion 1. Four of the buildings were designed by San Francisco Bay Area modernist architect, Don Knorr. The buildings are neither among his best known examples, nor are they good examples of Modern-era style. In addition, there have been major modifications to the buildings since their completion in 1961. It was concluded that the buildings do not appear to meet any of the criteria for listing on the CRHR. Substantial alterations to the buildings have compromised their integrity.[32] Based on a site inspection, and information and photographs provided by Stanford, ARG concurred that the property does not appear eligible for listing on the CRHR.[33] The City of Palo Alto's Historic Preservation Planner concurs with Stanford University's and ARG's evaluations, and believes that the structures do not merit listing on the CRHR.[34] Therefore, it is not considered to be an historical resource for purposes of CEQA analysis.

703 Welch Road, Welch Road Professional Center. The Welch Road Professional Center is a two-story, H-shaped building with one-story connecting elements at the north and south ends. Developer J.P. Aced completed the buildings first phase in 1958. The second story was an addition in 1963. The 1963 addition was designed by architect Bill Davies and landscape designer Doug Baylis. The original design has been compromised by the 1963 addition as well as by subsequent alterations.

Stanford University's Director of Heritage Services and University Archaeologist concluded that none of the tenants at the Welch Road Professional Center could be considered important to the local history, and that no significant events occurred at the property. Therefore, the property is not recommended eligible for listing on the CRHR under criteria 1 or 2. The building features a modern design, but is not an excellent example of the Modern-era style. Portions of the building have been redesigned and altered, and doors and windows have been replaced, compromising the building's integrity. It was concluded that the building at 703 Welch Road does not appear to be eligible for listing on the CRHR.[35]

ARG conducted a site inspection and reviewed information derived from the Stanford report. ARG concurred with the Stanford report's findings, stating that the Welch Road Professional Center lacks historic integrity and that it does not meet any of the CRHR criteria for listing; therefore it is not

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32 Jones, L., *Cultural Resources and the Stanford University Medical Facilities Renewal and Replacement Project,* 2007.

33 Architectural Resources Group, Inc., Stanford University Medical Center Historic Resource Evaluation and Peer Review, 2009.

34 Dennis Backlund, Historic Preservation Planner, City of Palo Alto, Staff Comments on the Stanford Shopping Center and University Medical Center: Historic Resource Evaluation and Peer Review, prepared by Architectural Resources Group, Inc., memorandum to Julie Caporgno, Chief Planning and Transportation Official, and Steven Turner, Advance Planning Manager, May 15, 2008.

35 Jones, L., *Cultural Resources and the Stanford University Medical Facilities Renewal and Replacement Project,* 2007.

considered to be an historical resource under CEQA.[36] The City of Palo Alto's Historic Preservation Planner agrees with Stanford University's and ARG's findings.[37]

1101 Welch Road, Medical Plaza. The Medical Plaza consists of three one-story buildings surrounded by parking lots, screening fences, and landscaping. There is a small courtyard between two of the buildings. The buildings were designed by William Wurster, and the grounds by landscape architect Lawrence Halprin.

The Stanford University report states that the medical offices and pharmacy on the property are not identified with any notable historic events or notable people. While the buildings were designed by a prominent architect, the buildings are a relatively late design. The buildings are common suburban professional office buildings. At the time of construction, giant eucalyptus trees along Governor's Avenue crossed the property, but have since been removed. It was concluded that the buildings' exteriors have retained integrity; however, the interiors have been updated and the landscaping has lost its integrity and therefore 1101 Welch Road does not appear eligible for listing on the CRHR.[38]

Based on a site inspection and a review of information provided in the Stanford report, ARG concurred with Stanford University's findings. ARG stated that the property is not associated with significant events or persons, is not a notable example of William Wurster's or Lawrence Halprin's work, and does not appear to be eligible for the CRHR.[39] The City of Palo Alto's Historic Preservation Planner concurs with Stanford University's and ARG's conclusions that the buildings do not appear eligible for the CRHR.[40] Therefore, it is not considered to be an historical resource for purposes of CEQA analysis.

Stone Building Complex. The Stone Building complex (also referred to as the 1959 Hospital Building complex) (including the East, West, Core, Boswell, Grant, Alway, Lane, and Edwards buildings), constructed in 1959 and 1963, is a large three-story building with two wings projecting from the main block to form a forecourt with a central fountain. Interior courtyards are located throughout the building complex. Originally the joint Palo Alto-Stanford Hospital and Stanford University Medical School, the building complex was designed by Edward Durell Stone and the landscaping was designed by Thomas Church.

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36 Jones, L., *Cultural Resources and the Stanford University Medical Facilities Renewal and Replacement Project,* 2007.

37 Dennis Backlund, Historic Preservation Planner, City of Palo Alto, Staff Comments on the Stanford Shopping Center and University Medical Center: Historic Resource Evaluation and Peer Review, prepared by Architectural Resources Group, Inc., memorandum to Julie Caporgno, Chief Planning and Transportation Official, and Steven Turner, Advance Planning Manager, May 15, 2008.

38 Jones, L., *Cultural Resources and the Stanford University Medical Facilities Renewal and Replacement Project,* 2007.

39 Architectural Resources Group, Inc., Stanford University Medical Center Historic Resource Evaluation and Peer Review, 2009.

40 Dennis Backlund, Historic Preservation Planner, City of Palo Alto, Staff Comments on the Stanford Shopping Center and University Medical Center: Historic Resource Evaluation and Peer Review, prepared by Architectural Resources Group, Inc., memorandum to Julie Caporgno, Chief Planning and Transportation Official, and Steven Turner, Advance Planning Manager, May 15, 2008.

Stanford University's Director of Heritage Services and University Archaeologist evaluated the Stone Building complex in 2007 as part of the SUMC Project Application. The evaluation concluded that the complex is not one of Stone's major achievements and is probably not eligible for listing on the CRHR.[41] In 2008, ARG, a firm that meets the Secretary of the Interior's Standards for Architectural History, performed, on behalf of the City of Palo Alto, an evaluation of the Stone Building complex which included a peer review of Stanford University's evaluation. ARG evaluated the Stone Building complex in relation to the eligibility criteria of the CRHR and the seven aspects of integrity defined in National Register Bulletin 15. ARG noted that Stone designed the Stanford University Medical Center/Palo Alto Hospital during a pivotal and innovative phase of his career; that it remains in its original location with its essential physical features intact; that although the setting has been altered, it is not significantly diminished; that the character-defining materials and workmanship are largely intact; and that the original feeling of the building is intact. In addition, both Stanford University and ARG noted that the complex is associated with an important historic event: the first heart transplant in the U.S. As a result, ARG concluded that the Stone Building complex appears eligible for listing on the CRHR and should be considered an historical resource for purposes of the City's CEQA review (see Appendix I).[42]

The City of Palo Alto's Historic Preservation Planner reviewed the evaluations of ARG and Dr. Jones of Stanford University. The City's Historic Preservation Planner concurred with ARG that although there have been some alterations to the complex's courtyards and the surrounding setting; the complex as a whole is largely intact and conveys the original design intent. In addition, the main entry facades and several architectural elements retain a high degree of integrity and convey an expression of Stone's work during an important phase of his career. The City's Historic Preservation Planner also agrees that enough time has passed to understand the significance of the heart transplant that occurred at the hospital, and that the building retains sufficient integrity for association with that time period. Therefore, the City's Historic Preservation Planner concurred with ARG that the Stone Building complex appears eligible for listing on the CRHR and therefore is an historical resource pursuant to CEQA.[43]

Applicable Plans and Regulations

Federal Regulations

The National Historic Preservation Act of 1966 (NHPA), as amended, established the NRHP, which contains an inventory of the nation's significant prehistoric and historic properties. Under 36 CFR 60,

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41 Jones, L., *Cultural Resources and the Stanford University Medical Facilities Renewal and Replacement Project,* 2007.

42 Architectural Resources Group, Inc., Stanford University Medical Center Historic Resource Evaluation and Peer Review, 2009.

43 Dennis Backlund, Historic Preservation Planner, City of Palo Alto, *Staff Comments on the Stanford Shopping Center and University Medical Center: Historic Resource Evaluation and Peer Review*, prepared by Architectural Resources Group, Inc., memorandum to Julie Caporgno, Chief Planning and Transportation Official, and Steven Turner, Advance Planning Manager, May 15, 2008.

properties are recommended for possible inclusion on the NRHP if the property is at least 50 years old,[44] has integrity, and meets one of the following criteria:

A. Is associated with significant events in history, or broad patterns of events;

B. Is associated with significant people in the past;

C. Embodies the distinctive characteristics of an architectural type, period, or method of construction, or is the work of a master, or possesses high artistic value, or that represents a significant and distinguishable entity whose components may lack individual distinction; and/or

D. Has yielded, or may yield, information important in history or prehistory.

Certain types of resources are usually excluded from consideration for listing in the NRHP, but can be considered if they meet special requirements in addition to meeting one of the above criteria. Such resources include religious sites, relocated structures, graves and cemeteries, reconstructed structures, commemorative structures, and structures that have achieved significance within the past fifty years. A resource that meets the NRHP criteria is typically considered a historical resource for purposes of CEQA evaluations. However, a resource that does not meet the NRHP standards may still be considered a historical resource if: it meets the state criteria for listing; it is included on a local register of historical resources; or it has been identified as significant in an historical resource survey meeting statutorily defined requirements.

State Regulations

As defined by Section 15064.5(a)(1) of the State CEQA Guidelines, a resource shall be considered historically significant if it has been listed on the CRHR, or if the State Historical Resources Commission has determined that the resource meets the criteria for listing. However, a resource need not be listed on any register to be found historically significant for CEQA purposes (Public Resources Code Section 21084.1). Guidelines Section 15064.5(a)(3) explains that a resource may be determined by the lead agency to be an historical resource if the agency's determination is supported by substantial evidence: "Generally a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing on the California Register of Historical Resources…" Therefore, for purposes of this analysis, the City has applied the CRHR criteria to evaluate whether buildings, structures, or landscape features within the SUMC Sites are historically significant.

Given that the CRHR was modeled after the NRHP, its eligibility criteria are very similar to the eligibility criteria of the NRHP except that the CRHR criteria also contain references to resources that reflect the history of California. Another consideration for eligibility for the CRHR is that sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than fifty (50) years old or older may be considered for listing in the California Register if it can be demonstrated that sufficient time has passed to understand its historical importance.[45] Generally, to be eligible for listing on the CRHR (and therefore considered a historical

[44] Criteria for inclusion under the California Register of Historic Resources are essentially the same as for the NRHP, except buildings 45 years old or older may qualify as historic resources.

[45] California Code of Regulations Section 4852(d)(2).

resource under CEQA), a resource must possess integrity and demonstrate eligibility under at least one of the following criteria:

A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

B. Is associated with the lives of persons important in our past;

C. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

D. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

Section 15064.5(c) of the State CEQA Guidelines applies to the analysis of effects on archaeological sites. When a project would affect an archaeological site, a lead agency must determine whether the site is an historical resource, and therefore subject to the CRHR criteria listed above (particularly Criterion 4), or whether the site is a *unique archaeological resource*, as defined in Section 21083.2 of CEQA, and whether the provisions of that section for mitigation apply. If a lead agency determines that an archaeological site is neither historic nor unique, the resource requires no further consideration, other than recordation of its existence if the lead agency so elects.

The State Historical Resources Commission (SHRC) is responsible for reviewing, commenting, and approving nominations to the NRHP, CRHR, California Historical Landmarks, and California Points of Historical Interest. As California's review board, the SHRC responsibilities include reviewing NRHP nominations and deciding if a nomination meets the eligibility criteria prior to its submission to the Keeper of the Register at the National Park Service. Approval by the SHRC is a recommendation to the State Historic Preservation Officer to forward the nomination for final approval by the Keeper of the Register. According to federal regulations, a property cannot be listed on the NRHP if the owner objects to the listing. If the owner objects, a property can, however, be determined eligible for listing by the Keeper of the Register. Those resources that the Keeper of the Register approves for listing or determines eligible for listing are automatically listed on the CRHR. Properties recommended and approved for listing by the SHRC as California State Historical Landmarks and California State Points of Historical Interest are also automatically listed on the CRHR.

Local Regulations

The City of Palo Alto's Historic Preservation Ordinance was adopted in 1980 and expanded to its current form in 1986. According to Section 16.49.010 of the Municipal Code, the purpose of the ordinance is to provide "recognition, protection, enhancement, and use of historically significant resources located within the City that are of great cultural, aesthetic, and economic benefit to the community." The ordinance covers over 450 historic properties that are listed on the Palo Alto Historic Inventory or are also on the NRHP. None of the buildings in the SUMC Sites are listed on the City of Palo Alto Master List of Structures on the Historic Inventory.[46]

[46] City of Palo Alto, *City of Palo Alto Master List of Historic Structures on the Historic Inventory,* revised June 14, 2006, http://www.cityofpaloalto.org/depts/pln/historic_preservation.asp.

Impacts and Mitigation Measures

Standards of Significance

Based on significance thresholds determined by the City of Palo Alto, the SUMC Project would result in a significant cultural resource impact if it would:

- Cause a substantial adverse effect (as defined in CEQA Guidelines section 15064.5(b)) on an historical resource listed or eligible for listing on the National and/or California Register, or listed on the City's Historic Inventory;
- Eliminate important examples of major periods of California history or prehistory;
- Cause damage to an historic or unique archaeological resource as defined in Section 15064.5 of the CEQA Guidelines;
- Disturb Native American human remains, including those interred outside of formal cemeteries;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or
- Directly or indirectly destroy a local cultural resource that is recognized by City Council resolution.

Environmental Analysis

CR-1. Impacts on Historical Resources. The SUMC Project would have a significant impact on historical resources. (S)

Demolition and Construction Impacts. The SUMC Project would involve the demolition of several buildings at both the Main SUMC Site and the Hoover Pavilion Site (see Figure 2-5 in Section 2 of this document). Buildings to be demolished include the sheds and storage buildings that are located at the Hoover Pavilion Site, just south of Hoover Pavilion; the SHC portion of the Stone Building complex (the East, West, Core, and Boswell Buildings); the 1973 Core Expansion Building; Parking Structure 3; the buildings at 1101 Welch Road, 703 Welch Road, 701 Welch Road; and the SHC portion of the Stone Building complex (the Grant, Alway, Lane, and Edwards Buildings). The Stone Building complex is the only structure to be demolished that appears eligible for listing on the CRHR (as described under Existing Conditions in this section) and is, therefore, considered by the City's Historic Preservation Planner, in concurrence with ARG, to be a significant historic resource. The demolition of the Stone Building complex would result in a significant impact on an historical resource.

Construction activities at the Hoover Pavilion Site include demolition, excavation, trenching, soil compaction, site grading, renovation of the existing Hoover Pavilion, and the addition of new structures. Vibration from construction activities in the vicinity of Hoover Pavilion, and accidents to the building from construction debris or equipment associated with nearby construction would have the potential to cause damage to sensitive architectural features on the Hoover Pavilion, which is an historical resource. The structures to be demolished include small sheds and storage facilities (including the Nurse's Cottage described under Existing Conditions in this section) that are roughly as close as 20 feet from the Hoover Pavilion. Demolition work also would include a second-floor walkway that extends from the Hoover Pavilion building to the Nurse's Cottage, and a loading dock attached to the Hoover Pavilion. The medical office building would be located as close as 50 feet from the Hoover Pavilion. The project application indicates that heavy-duty equipment such as excavators, drill rig, concrete mixers, and pump trucks would be used during the demolition of existing sheds, foundations, and below grade work.[47] The geotechnical reports for the Hoover Pavilion Site did not recommend pile driving, since the underlying geologic units can safely support shallow foundations. As such, no vibration from pile-driving is expected.

Without mitigation, vibrations caused by construction activities can result in various levels of damage to historic buildings ranging from cosmetic to structural.[48] Most demolition of on-site structures would occur at roughly 20 feet from the Hoover Pavilion, and construction of the medical office structures would occur at roughly 50 feet from the Hoover Pavilion. At 25 feet, heavy-duty construction equipment such as a large bulldozer would produce vibration levels of approximately 0.089 peak particle velocity (PPV) inches/second. The standard threshold for a building such as the historic Hoover Pavilion is 0.12 PPV;[49] this level would be reached at approximately 20 feet. Therefore, vibration from most of the construction at the Hoover Pavilion Site is below the threshold and no damage to the historic Hoover Pavilion is expected. However, the demolition of the small sheds and storage facilities (including the bridge to the Nurse's Cottage and the loading dock attached to the building) would occur within 20 feet of the historic Hoover Pavilion and could cause significant damage to architectural features. These activities would not cause structural damage to the Hoover Pavilion.

The architectural features that could be adversely affected include the terracotta panels located over windows on the portions of the Hoover Pavilion that would be within 20 feet of the area in which buildings would be demolished or heavy equipment movement would occur. In addition, the stucco sides of the building within 20 feet of such areas could be damaged by falling debris or accidents associated with construction equipment movement.

Impacts from Interior and Exterior Renovation of the Hoover Pavilion. In addition to the proposed demolition and construction, SHC plans to renovate the existing five-story concrete Hoover Pavilion structure for use as a medical office and clinic building while preserving and

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47 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 8.

48 California Department of Transportation Division of Environmental Analysis, Office of Noise, Air Quality, and Hazardous Waste Management , Sacramento, CA, *Transportation Related Earthborne Vibrations (Caltrans Experiences) Technical Advisory, Vibration TAV-02-01-R9601*, http://www.dot.ca.gov/hq/env/noise/pub/TRANSPORTATION%20RELATED%20EARTHBORNE%20VIBRATIONS.pdf> Page 10, (February 20, 2002).

49 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment,* Table 12-2, May 2006.

enhancing the historic art deco character of the building exterior. The building is currently used for clinics and would continue to be used for this purpose. Medical offices would be an additional use after renovation. The fourth floor of the Hoover Pavilion (approximately 6,000 square feet) would be dedicated to utilities and mechanical equipment. SHC anticipates that approximately one-half of the remaining space would be used and occupied by community practitioners, and one-half would be used and occupied by SHC. Presently, SHC uses Hoover Pavilion for some of its primary care clinic services. SHC anticipates continuing this use, and relocating its other primary care clinics from the Blake-Wilbur clinic building to the Hoover Pavilion.

The interior of the Hoover Pavilion building has been repeatedly remodeled since its original construction in the 1930s; there are no significant interior spaces that remain intact from that period, and there are only a few remnants of interior historic materials and finishes left. The renovation would require substantial interior demolition and reconstruction to meet building code requirements and support modern medical office and clinic use. As part of the SUMC Project, an inventory of the few surviving historic elements in the interior, such as light fixtures and ventilation grilles, and some stair railings, would be prepared. These elements would be reused where allowed by building codes and where compatible with the new uses of the building.

The SUMC Project's preservation focus for the Hoover Pavilion is to restore the exterior of the building so that its unique art deco character can be enhanced and appreciated. Exterior demolition would be limited to removal of additions made after the main building was completed in 1939, including the second-floor walkway to the Nurse's Cottage and loading dock, and alterations to support Americans with Disabilities Act (ADA) access and life safety as required by code (with reference to the accessibility provisions of the 2007 California Historical Building Code). The historic character of the building's exterior would be enhanced by removal of air conditioning units in window and door openings, and consolidation of rooftop mechanical equipment. The distinctive art deco terracotta panels and screens, bronze panels, and light fixtures would also be preserved and restored by the SUMC Project. The building's historic character-defining windows would be retained and restored. A proposal to replace existing historic windows would require review under the Secretary of the Interior's Standards for Rehabilitation of Historic Properties and approval by the City of Palo Alto.[50]

Because no significant interior spaces remain intact from the period of significance, interior renovations to Hoover Pavilion would have a less-than-significant impact on the historic integrity of the Hoover Pavilion. Exterior modifications would retain significant character-defining features (e.g. retaining and restoring historic windows) and eliminate non-historic elements (e.g. removal of window air conditioning units); therefore, would have a less-than-significant impact on the historic integrity of the Hoover Pavilion. The proposed Medical Office Building and parking structure would be in close proximity to the Hoover Pavilion;

[50] Catherine Palter, Associate Director, Land Use and Environmental Planning, Stanford University.

however, significant view would be retained and many non-historic buildings are in the surrounding area. And therefore, the changes to the surrounding setting resulting from these two new buildings would not result in an adverse, material alteration of significant characteristics and would result in a less-than-significant impact.

MITIGATION MEASURES. Implementation of the Mitigation Measures CR-1.1 and CR-1.5 would reduce potential vibration and construction-related impacts to the Hoover Pavilion resulting from demolition of adjacent sheds and storage facilities, impacts from falling construction debris, and impacts from movement of heavy equipment to a less-than-significant level. Implementation of Mitigation Measures CR-1.2 through CR-1.4 would reduce impacts due to the loss of the Stone Building complex; however, the impact would remain significant and unavoidable. Mitigation Measure CR-1.5 requires implementation of the Stanford Hoover Pavilion Protection Documents (Documents) prepared by ARG and dated September 21, 2009 (see Appendix J). These Documents provide specifications for the treatment and protection of the Hoover Pavilion during SUMC Project construction activities that could damage the historic fabric of the building including the installation of protective covering of certain exterior surfaces and the removal, cataloging, and storage of selective historic elements. The Documents are based on National Park Service and National Fire Protection Agency protection guidelines and include details on materials and methods of installation for the protective coverings to prevent damage from nearby demolition. Proper installation, as required in the Documents would prevent the protective covering itself from damage the building. The removal of historic elements would ensure their protection of some of the more fragile elements from construction activities and property cataloging and storage of such elements would ensure their proper care and reinstallation. The Documents include such details as specifying under what weather conditions it is acceptable to perform the various tasks that could be negatively impacted by different weather conditions. Any variations on the specifications of the Documents would not be allowed without prior consultation with ARG, or a qualified preservation architect. Refer to Appendix J, Stanford Hoover Pavilion Protection Documents, for a complete list of specifications for the Hoover Pavilion.[51] (SU)

CR-1.1 *Manually Demolish Structures at the Hoover Pavilion Site.* Where feasible, the project sponsors shall establish a perimeter of construction fencing around the Hoover Pavilion at a minimum of 25 feet to establish a protective buffer around the building. The demolition of these sheds and storage facilities shall be accomplished manually without the use of vibration causing equipment. Additional protective fencing at a height sufficient to prevent any debris from hitting the building shall also be installed between the Hoover Pavilion and demolition activities occurring within the 25 foot buffer.

CR-1.2 *Prepare HABS Documentation for the Stone Building Complex.* The SUMC Project sponsors shall prepare HABS-like documentation using the National Park

[51] Architectural Resources Group, Inc., "Stanford Hoover Pavilion Protection Documents," memo to PBS&J, September 21, 2009.

Services' Historic American Building Surveys Level III guidelines for each of the buildings in the Stone Building complex prior to demolition of each building that comprises this historic resource (East, West, Core, Boswell, Edwards, Lane, Alway, and Grant). HABS-like recordation shall not be required until each of the individual buildings is vacated and prepared for demolition. The documentation shall include written and photographic documentation of each of the historic structures within the Stone Building complex. The documentation shall be prepared by a qualified professional meeting the Secretary of the Interior's Professional Qualifications Standards for Architectural History or History.

The documentation shall be prepared based on the National Park Services' HABS standards and include, at a minimum, the following:

- Site-specific history and appropriate contextual information regarding the Stone Building complex. This history shall focus on the reasons for the buildings' significance: heart transplantation program and the role of E.D. Stone in the design of the complex.
- Accurate mapping of all buildings that are included in the Stone Building complex, scaled to indicate size and proportion of the buildings to surrounding buildings; if existing plans accurately reflect these relationships these may be reformatted for submittal per HABS guidelines for CAD submittals.
- Architectural descriptions of the major exterior features and public rooms within the Stone Building complex as well as descriptions of typical patient, office, laboratory, and operating rooms.
- Photographic documentation of the interior and exterior of the Stone Building complex and Thomas Church-designed landscape features. Either HABS standard large format or digital photography may be used. If digital photography is used, the ink and paper combinations for printing photographs must be in compliance with National Register-National Historic Landmark photo expansion policy and have a permanency rating of approximately 115 years. Digital photographs will be taken as uncompressed .TIF file format. The size of each image shall be 1600x1200 pixels at 300 ppi (pixels per inch) or larger, color format, and printed in black and white. The file name for each electronic image shall correspond with the Index to Photographs and photograph label.

CR-1.3 *Distribute Written and Photographic Documentation to Agencies*. The written and photographic documentation of historic resources shall be disseminated on archival-quality paper to Stanford University, the Northwest Information Center, and other local repositories identified by the City of Palo Alto.

CR-1.4 *Prepare Permanent Interpretive Displays/Signage/Plaques*. The SUMC Project sponsors shall install interpretive displays within the SUMC Sites that provide information to visitors and residents regarding the history of the Stone Building complex. These displays shall be installed in highly visible public areas such as the property's open space or in public areas on the interiors of buildings. The displays shall include historical data and photographs as well as physical remnants of architectural elements. Interpretive displays and the signage/plaques installed on the property shall be sufficiently durable to withstand typical Palo Alto weather conditions for at least five years. Displays and signage/plaques shall be lighted, installed at pedestrian-friendly locations, and be of adequate size to attract the interested pedestrian. Maintenance of displays and signage/plaques shall be included in the maintenance program on the property. Location and materials for the interpretative displays shall be subject to review by the Palo Alto Architectural Review Board and approval by the Planning Director.

CR-1.5 *Implement Protection Documents for the Hoover Pavilion.* The SUMC Project sponsors shall ensure the implementation of the Stanford Hoover Pavilion Protection Documents (Documents) prepared by ARG and dated September 21, 2009. The SUMC Project sponsors shall comply with the specifications for the treatment and protection of the Hoover Pavilion during SUMC Project construction activities that could damage the historic fabric of the building as provided in the Documents.

CR-2. Impacts on Prehistoric or Archaeological Resources. The SUMC Project could potentially encounter archaeological resources and result in a significant impact. (S)

All documented prehistoric archaeological resources are restricted to the creek vicinity and a 300-foot area that extends away from San Francisquito Creek. In these areas, there are dense archaeological remains, including village sites and burials.[52] Outside of this zone, prehistoric cultural resources have not been encountered. The SUMC Project would involve ground-disturbing activities. Although the SUMC Project is not likely to affect Native American or historic-period archaeological resources since the SUMC Sites are entirely outside of this archaeological zone, there is the possibility that archaeological resources could be encountered outside of the archaeological zone. This could be a significant impact. The SUMC Project sponsors would be required to implement Mitigation Measure CR-2.1 in the event unknown archaeological resources are discovered during construction.

MITIGATION MEASURE. Mitigation Measure CR-2.1 provides discovery and evaluation procedures for any previously unknown archaeological resources on the SUMC Sites and requires that a professional archaeologist employ preservation in place, data recovery, or other methods that meet the Secretary of the Interior's Standards for Archaeological Documentation to reduce impacts on unique archaeological resources. Therefore, implementation of the following mitigation measure would ensure the impact remains less than significant. (LTS)

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[52] Laura Jones, Director, Heritage Services and University Archaeologist, personal communication, January 3, 2008.

CR-2.1 *Construction Staff Training and Consultation.* Prior to any construction or earth-disturbing activities, a qualified archaeologist shall inform construction supervisors of the potential to encounter cultural resources. All construction personnel shall be instructed to be observant for prehistoric and historic-era artifacts, subsurface archaeological features or deposits, including accumulations of dark, friable soil ("midden"), stone artifacts, animal bone, and shell. In the event that any prehistoric or historic subsurface archaeological features or cultural deposits are discovered during construction-related earth-moving activities, all ground-disturbing activity within 100 feet of the resources shall be halted and the City shall be notified. The City shall consult with the Stanford University Archeologist to assess the significance of the find. If the find is determined to be an historical resource or a unique archaeological resource as defined by CEQA, then representatives of the City and the Stanford University Archaeologist shall meet to determine the appropriate course of action. All significant cultural materials recovered shall be subject to scientific analysis, professional museum curation, and a report shall be prepared by the qualified archaeologist according to current professional standards.

CR-3. Impacts on Human Remains. The SUMC Project could potentially encounter human remains and result in a significant impact. (S)

No human remains have been encountered within the boundaries of the SUMC Sites. Native American burials, however, are commonly found in the vicinity of the SUMC Sites along San Francisquito Creek. The Main SUMC Site is located about 0.25 miles south of the creek and the Hoover Pavilion Site is about 1,500 feet south of the creek. It is unlikely but possible that human remains could be encountered during ground-disturbing activities. This impact could be significant. Human burials apart from being potential archaeological resources have specific provisions for treatment in Section 5097 of the California PRC and Sections 7050.5, 7051, and 7054 of the California Health and Safety Code. If unanticipated human remains were discovered during construction, the SUMC Project sponsors would be required to comply with those regulations.

MITIGATION MEASURE. Mitigation Measure CR-3.1 summarizes the procedures to be taken in the event that any previously unknown human remains are discovered on the SUMC Sites. Therefore, implementation of the following mitigation measure would ensure that the potential impact remains less than significant. (LTS)

CR-3.1 *Conduct Protocol and Procedures for Encountering Human Remains.* If human remains (including disarticulated or cremated remains) are discovered at any SUMC Project construction site during any phase of construction, all ground-disturbing activity within 100 feet of the human remains should be halted and the Stanford University Archaeologist, City of Palo Alto, and the County coroner notified immediately, according to Section 5097.98 of the State Public Resources Code and Section 7050.5 of California's Health and Safety Code. If the remains are determined by the County coroner to be Native American, the Native American Heritage Commission (NAHC) shall be notified within 24 hours, and the guidelines of the NAHC adhered to in the treatment and disposition of the remains. The SUMC Project sponsors shall retain a professional archaeologist with Native American burial experience to conduct a field investigation of the specific site and consult with the Most Likely Descendant, if any, identified by the NAHC. As necessary, the archaeologist may provide professional assistance to the City of Palo Alto, including the excavation and removal of the human remains. If the human remains cannot be avoided, and the Most Likely Descendant requests that the human remains be removed from its location, the SUMC Project sponsors shall implement removal of the human remains by a professional archaeologist. The City of Palo Alto shall verify that the mitigation is complete before the resumption of ground-disturbing activities within 100 feet of where the remains were discovered.

CR-4. Impacts on Paleontological Resources. The SUMC Project could have a significant impact on unique paleontological resources or unique geologic resources. (S)

The entire Bay Area region is considered to be rich in paleontological resources, and there have been significant finds in the immediate vicinity. Paleontological resources found include a large mastodon tusk in the bank of San Francisquito Creek, the upper limb of a giant bison, and individual skeletal elements. In addition, one of the best-preserved and complete specimens of a Paleoparadoxia ("sea cow") outside of China was discovered near the SLAC Linear National Laboratory to the west of the SUMC Sites. Although a review of the Geologic Map of California suggests that there is no fossil potential for the SUMC Sites, a Pleistocene-age creek bed occurs 15 to 25 feet below the surface of the SUMC Sites. The stream bed has been encountered under the Lucas Center and below the storm drain at Quarry Road near El Camino Real; however the precise location of the stream bed is unknown. The excavation of trenches that are at least 100 feet in length (or a sufficient length to support detailed hydrological study) or 15 feet in depth could expose the buried Pleistocene-era stream channel and intact skeletons of extinct species as previous construction activities have shown that this creek bed contains paleontological resources. Sensitivity to paleontological resources is therefore considered high throughout the vicinity of the SUMC Sites, including the SUMC Sites. Disturbance of any paleontological resource is a significant impact.

MITIGATION MEASURE. Mitigation Measure CR-4.1 provides protocol for encountering paleontological resources and would reduce the potential impacts resulting from disruption to unique paleontological resources to a less-than-significant level. (LTS)

CR-4.1 *Conduct Protocol and Procedures for Encountering Paleontological Resources.* Should paleontological resources be identified during SUMC Project ground-disturbing activities, the SUMC Project sponsors shall notify the City and the Stanford University Archaeologist and cease operations in the vicinity of the potential resource until a qualified professional paleontologist can complete the following actions when appropriate:

- Identify and evaluate paleontological resources by intense field survey where impacts are considered high;
- Assess effects on identified resources; and
- Consult with the City of Palo Alto and the Stanford University Archaeologist.

Before operations in the vicinity of the potential resource resume, the SUMC Project sponsors shall comply with the paleontologist's recommendations to address any significant adverse effects where determined by the City of Palo Alto to be feasible. In considering any suggested mitigation proposed by the consulting paleontologist, the SUMC Project sponsors shall consult with the Stanford University Archaeologist and the City to determine whether avoidance is necessary and feasible in light of factors such as the nature of the find, project design, cost policies and land use assumptions, and other considerations. If avoidance is infeasible, other appropriate measures (e.g. data recovery) shall be instituted to avoid a significant impact. Work may proceed in other parts of the SUMC Sites while mitigation for paleontological resources is completed.

Cumulative Analysis

The cumulative analysis for impacts on cultural and paleontological resources considers a broad cultural and regional system of which the resources are a part. The cumulative context for historical resources includes past projects, current projects, and probable future projects that affect historic properties/resources within the City, especially any that could affect similar resources such as other E.D. Stone-designed buildings. The cumulative context for archaeological resources includes past projects, current projects, and probable future projects that occur within the 300-foot archaeologically sensitive zone along San Francisquito Creek because resources in this sensitive area comprise a geographically distinct cluster of resources. The cumulative context for paleontological resources includes areas where the Pleistocene-age creek bed may occur below the surface. Since the exact location of the underground streambed is unknown, it is assumed that the creek runs through the SUMC Sites and adjacent areas.

CR-5. Cumulative Impacts on Historic Resources. The SUMC Project, in combination with other past, current, and probable future development in the City, would cause a substantial change in the significance of the City's historic resources and thus have a significant cumulative impact. The SUMC Project's contribution to the cumulative impact would be cumulatively considerable. (S)

As provided by the City for this analysis, four other projects in the City could result in potential impacts on historical resources. These projects include the preservation and rehabilitation of the historic French Laundry building and the African Methodist Episcopal

Zion Church at 260 Homer Avenue, the historic rehabilitation of 317-323 University Avenue, the rehabilitation of an existing colonial revival residence at 564 University Avenue, and the California HST project. The first three projects have been approved by the City of Palo Alto as complying with the Secretary of the Interior's Standards for Rehabilitation, and all three historic buildings will be preserved under those projects. The environmental review process for the HST project is not complete; therefore impacts of the HST project historical resources are unknown at this time. However, the more appropriate context to evaluate cumulative impacts would be to examine other E.D. Stone buildings. The following provides the current condition of other E.D. Stone buildings in Palo Alto in order to determine the project's cumulative contribution to potential impacts on Stone's work.

The SUMC Project would result in a significant impact on historical resources, including the demolition of the Stone Building complex. In addition to the Stone complex, E.D. Stone built three other buildings in Palo Alto; the Palo Alto Civic Center, Palo Alto Main Library, and Mitchell Park Library. The Palo Alto Civic Center and the Mitchell Park Library have both been evaluated by ARG. It was determined that both lacked sufficient integrity to qualify as historical resources. However, the Palo Alto Main Library has been determined eligible for the NRHP. Currently, plans call for renovation and expansion of the Main Library and the relocation of the City Police Department and Emergency Operations facilities from their current location within Palo Alto Civic Center to the proposed Public Safety Building. It is uncertain at this time whether or not the HST project would impact other works of E.D. Stone.

In combination with the SUMC Project, cumulative development above would have cumulatively significant impacts on historic resources in the City because these would together result in adverse impacts (loss) of at least one historically significant structure. Only one other E.D. Stone building in Palo Alto, the Palo Alto Main Library retains sufficient integrity to be eligible for listing. The demolition of the Stone Building complex would comprise a considerable loss of an historical resource that is a unique and non-renewable member of a finite class. The demolition of the Stone Building complex would have a cumulatively considerable impact due to the small body of E.D. Stone's work present in the City that retains sufficient integrity to be eligible as historical resources.

MITIGATION MEASURES. Due to the demolition of the Stone Building complex, the SUMC Project's contribution would remain cumulatively considerable as this impact cannot be avoided. Implementation of Mitigation Measures CR-1.2 through CR-1.4 would reduce the SUMC Project's contribution to the cumulative impact, but not to a less than cumulatively considerable level. (SU)

CR-6. *Cumulative Impacts on Prehistoric and/or Archaeological Resources and Human Remains. The SUMC Project, in combination with other reasonably foreseeable probable future development, could cause a substantial change in the significance of prehistoric and/or archaeological resources or human remains and thus contribute to a significant cumulative impact. The SUMC Project is conservatively assumed to have a considerable contribution. (S)*

The cumulative context for archaeological resources is defined as the 300-foot archaeological zone along San Francisquito Creek that runs within Palo Alto as well as Menlo Park, East Palo Alto, and Stanford University lands in unincorporated Santa Clara County. Based on the Cumulative Projects list within the City (see Section 3.1, Introduction to Analysis and Appendix B), two residential projects are planned along San Francisquito Creek as well as a portion of the HST project. The HST project includes a segment proposed along the existing Caltrain right-of-way between San Jose and San Francisco, which would cross the San Francisquito Creek in Palo Alto. Both of the residential projects were found to have no archaeological impacts and the environmental review process for the HST project is not complete, although the HST project could impact prehistoric resources within the 300-foot zone. All other probable future projects are outside of the archaeologically sensitive zone along San Francisquito Creek. The Emergency Reservoir project approved by the City of Palo Alto would be constructed at El Camino Park, near San Francisquito Creek. No archaeological sites were identified during the archival search or the survey; however one well site is located in along the bank of San Francisquito Creek and a second is located within 1,000 feet of the creek. The project was determined to have no significant impacts to archaeological resources with implementation of mitigation measures. The SUMC Project would involve ground-disturbing activities; however, the SUMC Sites are entirely outside of the 300-foot archaeologically sensitive zone along San Francisquito Creek and therefore the SUMC Project is not likely to affect Native American or historic-period archaeological resources. As such the SUMC project's contribution would be less than cumulatively considerable. In the unlikely event that cultural resources are discovered during construction the disturbance of intact archaeological resources could contribute to a significant cumulative impact. Nonetheless, due to the potential for impact, this analysis conservatively concludes that the SUMC Project could have considerable impacts on prehistoric and/or archaeological resources and human remains.

MITIGATION MEASURES. Compliance with Mitigation Measures CR-2.1 and CR-3.1 would reduce the SUMC Project's contribution to the cumulative impact to a less than cumulatively considerable level. (LTS)

CR-7. *Cumulative Impacts on Paleontological Resources. The SUMC Project, in combination with other reasonably foreseeable probable future development where the Pleistocene-age creek bed may occur, could have a significant cumulative impact. Such an impact would occur if the buried Pleistocene-age creek bed is exposed in lengths greater than approximately 100 feet (or a sufficient length to support detailed hydrological study) and if such deposits contain substantially intact skeletons of extinct species. These conditions would represent a major find for regional paleontology. In the case that significant paleontological finds—such as stretches* *of buried Pleistocene-age creek bed greater than 100 feet in length and containing intact skeletons of extinct species—are made on the SUMC Site, then the SUMC Project's contribution to the cumulative impact on paleontological resources could be cumulatively considerable. (S)*

As stated above, the cumulative context for paleontological resources includes areas where the Pleistocene-age creek bed may occur below the surface. Reasonably foreseeable probable future development in the SUMC Sites and adjacent areas includes (1) approved but unconstructed development under the Stanford University Community Plan and General Use Permit (CP/GUP), which would include additional academic facilities, housing units, parking, and associated utilities, roadways and bikeways in the adjacent Stanford University property; and (2) demolition of existing structures and construction of a three-story medical office building at 777 Welch Road. The HST project could be constructed in an area that may contain the Pleistocene-age creek bed. The location, extent, and depth of the underground streambed resource that underlies the SUMC Sites is not sufficiently well defined to establish whether the disruption caused by each of these projects would or would not be significant. Because the exact location of the resource is unknown, it is assumed that the underground streambed underlies the SUMC Sites and adjacent areas. Consequently, reasonably foreseeable probable future development projects to cumulative effects on the paleontological resources that could occur in the streambed could be significant.

The potential contribution of the SUMC Project to the cumulative impact would be cumulatively considerable as disturbance under the SUMC Project would comprise a major portion of ground disturbance (and potential disturbance of the Pleistocene-age creek bed).

MITIGATION MEASURE. Compliance with Mitigation Measure CR-4.1 would reduce the SUMC Project's contribution to the cumulative impact to a less than cumulatively considerable level. (LTS)

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3.9 Biological Resources

Introduction

This section addresses potential effects on biological resources should the SUMC Project be implemented. Existing conditions, such as habitat types and plant and animal species present, are described based on site-specific information developed for the SUMC Project and published technical information, as indicated in footnoted references. The primary sources of information referenced in this section regarding biological resources are:

- California Department of Fish and Game's (CDFG) October 2007 Special Animals list;
- California Department of Fish and Game's Natural Diversity Database (CNDDB), Rarefind 3 database program, California Department of Fish and Game (updated March 2010);
- U.S. Fish and Wildlife Service's (USFWS) website September 2007 (updated February 2008); Certified Arborist's Tree Inventory for Stanford Medical Center Area Project, Ray Morneau, Certified Arborist, September 2007;
- City of Palo Alto Tree Technical Manual Protocol for Regulated Trees, Required Tree Surveys and Tree Preservation Reports, PAMC 8.10.030;
- Stanford University Memorandum dated July 28, 2008, from Alan Launer, Ph.D. to Steven Turner titled *History and scope of databases on species present at Stanford, including discussion of species of conservation concern at the Stanford University Medical Center and Stanford Shopping Center Project Sites*; and
- A December 11, 2007 reconnaissance level survey conducted by a PBS&J biologist in support of this EIR section.

Response letters to the NOP and during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project were considered in preparing this EIR. However, no comments regarding potential effects on biological resources were received.

Existing Conditions

Surrounding Areas

The area surrounding the SUMC Sites as a whole is urbanized, consisting of a mixture of residential, commercial, and industrial development, and associated infrastructure. This urbanized environment isolates the SUMC Sites from natural habitats where special-status plant or wildlife species known from the region are likely to occur. Despite the urbanized nature of the surrounding area, drainages passing through the area provide some level of connectivity for urban-tolerant wildlife between the San Francisco Bay, approximately 3 miles to the northeast, and the foothills of the Coast Ranges, approximately 2 miles to the southwest. Vegetation in the area consists primarily of ornamental trees and shrubs associated with landscaping, but some native oaks and redwoods are present. No wetlands or other waters are present adjacent to the SUMC Sites, but San Francisquito Creek passes within 0.25 miles to the north of the Main SUMC Site. Site specific descriptions of the Main SUMC Site and the Hoover Pavilion Site are provided later in this section.

Special-Status Species

The potential occurrence of special-status plant and animal species within the SUMC Sites and surrounding region has been determined through habitat information collected through a review of the CDFG's CNDDB, the December 11, 2007 reconnaissance field survey by PBS&J, and the USFWS online species list database, which is available at the City Department of Planning and Community Environment upon request.

For the purposes of this section, special-status species include:

- species listed, proposed, or candidate species for listing as Threatened or Endangered by the USFWS pursuant to the Federal Endangered Species Act (FESA) of 1973, as amended;
- species listed as Rare, Threatened, or Endangered by the California Department of Fish and Game (CDFG) pursuant to the California Endangered Species Act (CESA) of 1984, as amended;
- species designated as Fully Protected under Sections 3511 (birds), 4700 (mammals), and 5050 (reptiles and amphibians) of the California Fish and Game Code;
- species designated by the CDFG as California Species of Special Concern;
- species listed on the CDFG California Special Animals List;
- plant species listed as Category 1B and 2 by the California Native Plant Society (CNPS); and
- species not currently protected by statute or regulation, but considered rare, threatened, or endangered under CEQA Guidelines Section 15380.

Species identified through the above means, along with their status and likelihood of occurrence in the SUMC Sites and adjacent areas are listed in Table 3.9-1. This list represents special-status species identified in the review of the CNDDB and USFWS queries and the likelihood that they could occur in the SUMC Sites and adjacent areas (i.e., within the known range, and/or with potential habitat present). Species identified by these sources as potentially occurring in the region, but for which there is no suitable habitat, and the SUMC Sites are outside the known range of the species, are not addressed further. Additionally, species identified in the CDFG and USFWS queries that do not meet the status criteria described above are not addressed in this document. Additionally, since no aquatic habitat is present in the SUMC Sites and adjacent areas, no special-status fish species known to occur in the region are addressed in this document.

Table 3.9-1
Special-Status Species Potentially Occurring on the SUMC Sites

Species	Status Fed/State/ Other	Habitat	Likelihood of Occurrence in the SUMC Sites
PLANTS			
Allium peninsulare var. *franciscanum* Franciscan onion	--/--/1B.2	Occurs in cismontane woodland, valley and foothill grassland on clay, volcanic, or often serpentinite soils. Blooms May to June, and ranges in elevation from 52 to 300 meters.	**None:** Known from Stanford lands, but no suitable habitat occurs within or adjacent to the SUMC Sites.
Amsinckia lunaris Bent-flowered fiddleneck	--/--/1B.2	Occurs in coastal bluff scrub, cismontane woodland, valley and foothill grassland. Blooms March to June, and ranges in elevation from 3 to 500 meters.	**None:** Known from Stanford lands, but no suitable habitat occurs within or adjacent to the SUMC Sites.
Astragalus tener var. tener Alkali milk-vetch	--/--/1B.2	Occurs in playas, valley and foothill grassland (adobe clay), and vernal pools /alkaline. Blooms March to June, and ranges in elevation from 1 to 60 meters.	**None:** Known from Stanford lands, but no suitable habitat occurs within or adjacent to the SUMC Sites.
California macrophylla Round-leaved filaree	--/--/1B.1	Occurs in cismontane woodland, valley and foothill grassland/clay. Blooms from March to May, and ranges in elevation from 15 to 1200 meters.	**None:** Known from Stanford lands, but no suitable habitat occurs within or adjacent to the SUMC Sites.
Centromadia parryi ssp. congdonii Congdon's tarplant	--/--/1B.2	Occurs in valley and foothill grassland (alkaline). Blooms from May to October (November) months in parentheses are uncommon. Elevation ranges from 1 to 230 meters.	**None:** Known from Stanford lands, but no suitable habitat occurs within or adjacent to the SUMC Sites.
Dirca occidentalis Western leatherwood	--/--/1B.2	Occurs in broad-leafed upland forest, closed-cone coniferous forest, chaparral, cismontane woodland, North Coast coniferous forest, riparian forest, and riparian woodland, usually on mesic sites. Blooming period extends from January to March (sometime April). Elevation ranges from 50 to 395 meters.	**None:** Known from Stanford lands, but no suitable habitat occurs within or adjacent to the SUMC Sites.

Table 3.9-1
Special-Status Species Potentially Occurring on the SUMC Sites

Species	Status Fed/State/ Other	Habitat	Likelihood of Occurrence in the SUMC Sites
Eriophyllum latilobum San Mateo wooly sunflower	FE/SE/1B.2	Occurs in cismontane woodland (often serpentinite, on roadcuts). Blooms from May to June, and ranges in elevation from 45 to 150 meters.	**None:** Known from Stanford lands, but no suitable habitat occurs within or adjacent to the SUMC Sites.
Fritillaria liliacea Fragrant fritillary	--/--/1B.2	Coastal prairie, coastal scrub, valley and foothill grasslands; often serpentinite; elevation 3 to 410 meters; blooms February to April.	**None:** Known from Stanford lands, but no suitable habitat occurs within or adjacent to the SUMC Sites.
Lasthenia conjugens Contra Costa goldfields	FE/--/1B.1	Occurs in cismontane woodland, playas (alkaline), valley and foothill grassland, and vernal pools/mesic. Blooms from March to June, and ranges in elevation from 0 to 470 meters.	**None:** Known from Stanford lands, but no suitable habitat occurs within or adjacent to the SUMC Sites.
Monardella villosa ssp. globosa Robust monardella	--/--/1B.2	Occurs in broadleafed upland forest (openings), chaparral (openings), cismontane woodland, coastal scrub, valley and foothill grassland. Blooms from June to July (Aug). Months in parentheses are uncommon. Elevation ranges from 100 to 915 meters.	**None:** Known from Stanford lands, but no suitable habitat occurs within or adjacent to the SUMC Sites.
Tropidocarpum capparideum Caper-fruited tropidocarpum	--/--/1B.1	Valley and foothill grassland (alkaline hills), Blooms from March to April, and ranges in elevation from 1 to 455 meters.	**None:** Known from Stanford lands, but no suitable habitat occurs within or adjacent to the SUMC Sites.

Table 3.9-1
Special-Status Species Potentially Occurring on the SUMC Sites

Species	Status Fed/State/ Other	Habitat	Likelihood of Occurrence in the SUMC Sites
WILDLIFE			
Invertebrates			
Danaus plexippus Monarch butterfly	None, but may be considered under CEQA (CDFG Special Animal)	Congregates by the thousands in Eucalyptus or other groves of large trees during winter migration.	**None:** Potential roosting habitat present in the SUMC Sites but has not been recorded to roost there.
Euphydryas editha bayensis Bay checkerspot butterfly	FT/--/--	Occurs in grasslands in areas with serpentine soil, soils derived from the serpentine mineral, and other ultramafic rocks where its host plants *Plantago erecta*, *Castilleja exserta*, and *Castilleja densiflora* are present. Has disappeared from much of its former range due to development.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Incisalia mossii bayensis San Bruno elfin butterfly	FE/--/--	This species is restricted to a few small populations, the largest of which occurs on San Bruno Mountain. Occurs on scattered on rocky slopes and ledges, especially east facing, where its host plant Broadleaf Stonecrop (*Sedum spathulifolium*) is present.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Amphibians			
Ambystoma californiense California tiger salamander	FT/CSC/--	Valley and foothill grasslands and adjacent oak woodlands; shelters in rodent burrows and breeds in seasonal wetlands such as vernal pools.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Rana draytonii California red-legged frog	FT/CSC/--	Creeks and streams with deep pools and dense bank vegetation; presence of adjacent woodlands and grasslands important.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Reptiles			
Actinemys marmorata Western pond turtle	--/CSC/--	Ponds, streams and rivers with abundant woody debris for basking sites.	**None:** No suitable habitat within or adjacent to the SUMC Sites.

Table 3.9-1
Special-Status Species Potentially Occurring on the SUMC Sites

Species	Status Fed/State/ Other	Habitat	Likelihood of Occurrence in the SUMC Sites
Thamnophis sirtalis tetrataenia San Francisco garter snake	FE/SE/--	Utilizes a wide variety of habitats, preferring grasslands or wetlands near ponds, marshes and sloughs. May overwinter in upland areas away from water.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Birds			
Accipiter cooperii Cooper's hawk	---/CSC/--	Mature forests and open woodlands; nests primarily in deciduous riparian trees and live oaks.	**Moderate:** Species may nest within oaks on site, though no suitable nest structures were observed during surveys of the SUMC Sites.
Agelaius tricolor Tricolored blackbird	--/CSC/ --	Open grasslands and marshes with large blackberry thickets or large stands of cattails or tules.	**None:** No breeding colonies or suitable habitat within or adjacent to the SUMC Sites.
Athene cunicularia Burrowing owl	--/CSC/ --	Grasslands, deserts and scrub lands with low growing vegetation; dependent on burrowing mammals, especially ground squirrels.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Circus cyaneus Northern harrier	--/CSC/ --	Grasslands and open habitats; typically nests on the ground in dense vegetation.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Falco peregrinus anatum American peregrine falcon	--/SE/ --	Peregrine falcons will use almost any habitat type that provides hunting opportunities. For nesting purposes, peregrine falcons prefer habitats with cliffs, but have been known to nest and hunt in cities with tall buildings.	**None:** Although marginally suitable habitat occurs within the SUMC Sites, this species has not been recorded there.
Geothlypis trichas sinuosa Saltmarsh common yellowthroat	--/CSC/ --	Willow riparian and salt and brackish water marshes with tall emergent vegetation.	**None:** No suitable salt marsh breeding habitat within the SUMC Sites or vicinity, but this species may occasionally pass through the riparian area along San Francisquito Creek.

Table 3.9-1
Special-Status Species Potentially Occurring on the SUMC Sites

Species	Status Fed/State/ Other	Habitat	Likelihood of Occurrence in the SUMC Sites
Riparia riparia Bank swallow	--/ST/--	Willow riparian and salt and brackish water marshes with tall emergent vegetation.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Mammals			
Neotoma fuscipes annectens San Francisco dusky-footed woodrat	--/CSC/--	Woody habitats of moderate canopy and moderate to dense understory. Constructs nests of shredded grass, leaves, branches, and other material. May be limited by availability of nest-building materials.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Antrozous pallidus Pallid Bat	--/CSC/ --	Typically roosts in rock crevices, buildings, and bridges in arid regions. Forages over dry land, typically taking prey from the ground or off of foliage.	**Moderate:** Potentially suitable habitat in older buildings and parking structures within the SUMC Sites.
Corynorhinus (Plecotus) townsendii Townsend's big-eared bat	--/CSC/ --	Typically occurs in arid western desert scrub and pine forest regions. Females form maternity colonies in mines, caves, or buildings in spring and summer, while males roost individually. This species is extremely sensitive to disturbance at their roosting sites (particularly maternity roosts) and have suffered severe population declines throughout much of the U.S. Townsend's big-eared bat hibernate in caves and abandoned mines in the winter months.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Lasionycteris noctivagans Silver-haired bat	None, but may be considered under CEQA (CDFG Special Animal)	Closely associated with coniferous or mixed coniferous and deciduous forest types, especially in areas of Old Growth. Forages over streams, ponds and open brushy areas.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Eumops perotis californicus Greater western mastiff-bat	--/CSC/ --	Typically roosts in cliff-face crevices and feed high above the ground. Rarely seen as they approach the ground only at a few select drinking sites. This species is severely limited by available drinking water, as its long, narrow wings preclude it from drinking at ponds less than 100 feet long.	**None:** No suitable habitat within or adjacent to the SUMC Sites.

Table 3.9-1
Special-Status Species Potentially Occurring on the SUMC Sites

Species	Status Fed/State/ Other	Habitat	Likelihood of Occurrence in the SUMC Sites
Lasiurus cinereus Hoary bat	None, but may be considered under CEQA (CDFG Special Animal)	Solitary, foliage roosting species that is infrequently observed. Roosts are typically outside of urban areas in riparian habitat. Forages in open areas or along habitat edges.	**Moderate:** Potentially suitable habitat in trees in the SUMC Sites and along the riparian vegetation along San Francisquito Creek.
Lasiurus blossevillii Western red bat	--/CSC/ --	Typically occurs in association with riparian woodlands. Roosts in the foliage of riparian trees such as cottonwoods and sycamores.	**Moderate:** Potentially suitable habitat in trees in the SUMC Sites and along the riparian vegetation along San Francisquito Creek.
Myotis ciliolabrum Western small-footed myotis	None, but may be considered under CEQA (CDFG Special Animal)	This species rears its young in cliff-face crevices, erosion cavities, and beneath rocks on the ground. Some females care for their pups alone, while others form small maternity groups. This species is known to hibernate in caves or mines, but little else is known about them.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Myotis evotis Long-eared myotis	None, but may be considered under CEQA (CDFG Special Animal)	Typically roosts in tree cavities and beneath exfoliating bark in both living trees and dead snags. Pregnant females often roost at ground level in rock crevices, fallen logs, and even in the crevices of sawed-off stumps, but are frequently unsuccessful rearing young in such vulnerable locations.	**Moderate:** Potentially suitable habitat in larger trees within the SUMC Sites.
Myotis lucifugus Little brown bat	None, but may be considered under CEQA (CDFG Special Animal)	Occurs primarily in mountainous and riparian areas in a wide variety of forest habitats; from tree-lined xeric-scrub to aspen meadows and Pacific Northwest coniferous rain forests. This species is especially associated with humans, often forming nursery colonies containing hundreds, sometimes thousands of individuals in buildings, attics, and other man-made structures. This species forages over water where their diet consists of aquatic insects, mainly midges, mosquitoes, mayflies, and caddisflies. They also feed over forest trails, cliff faces, meadows, and farmland where they consume a wide variety of insects, from moths and beetles to crane flies.	**Moderate:** Potentially suitable habitat in older buildings and parking structures within the SUMC Sites.

Table 3.9-1
Special-Status Species Potentially Occurring on the SUMC Sites

Species	Status Fed/State/ Other	Habitat	Likelihood of Occurrence in the SUMC Sites
Myotis thysanodes Fringed myotis	None, but may be considered under CEQA (CDFG Special Animal)	Typically occurs in woodlands at moderate elevation in mountains. Both night and day roosts include caves, mines, and buildings (typically abandoned). This species is known to hibernate in caves and buildings, but not much is known about their wintering whereabouts.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Myotis volans Long-legged myotis	None, but may be considered under CEQA (CDFG Special Animal)	Occurs in wooded habitats from pinon-juniper to coniferous forests, usually at elevations of 4,000 to 9,000 feet. Maternity roosts typically occur beneath bark and in other cavities. Most maternity colonies occur in at least 100 year-old trees that provide crevices or exfoliating bark.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Nyctinomops macrotis Big free-tailed bat	None, but may be considered under CEQA (CDFG Special Animal)	Typically occurs in desert and arid grassland areas where rocky out-crops, canyons, or cliffs provide ideal roosts, but will occasionally roost in buildings. This species is seldom encountered by people, though they can often be heard calling high overhead in cliff-sided river valleys where they are known to occur.	**None:** No suitable habitat within or adjacent to the SUMC Sites.
Myotis yumanensis Yuma myotis	None, but may be considered under CEQA (CDFG Special Animal)	Typically roosts in buildings, bridges, large trees with hollows, crevices in cliffs, and occasionally in mines or caves. Forages over water in forested areas. Common along wooded canyon bottoms throughout California. Optimal habitats are open forests and woodlands with sources of water over which to feed. Distribution is closely tied to bodies of water.	**Moderate:** Potentially suitable habitat in older buildings and parking structures within the SUMC Sites.
Taxidea taxus American badger	--/CSC/--	Occurs in dry, open grasslands, fields, and pastures. They are found from high alpine meadows to sea level.	**None:** No suitable habitat within the SUMC Sites or vicinity.

Table 3.9-1
Special-Status Species Potentially Occurring on the SUMC Sites

Sources: California Department of Fish and Game's Natural Diversity Database (CNDDB), updated March 2010 USFWS Online Threatened and Endangered Species Database, updated March 2008. http://sacramento.fws.gov/es/spp_lists/auto_list_form.cfm CNPS Online Inventory of Rare, Threatened and Endangered Plants http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi Status Codes:

Notes:

Federal:
FE – Listed as Endangered under the Federal Endangered Species Act
FT – Listed as Threatened under the Federal Endangered Species Act
FPE – Proposed for Listing as Endangered under the Federal Endangered Species Act
NMFS – National Marine Fisheries Service

State:
SE – Listed as Endangered under the California Endangered Species Act
ST – Listed as Threatened under the California Endangered Species Act
FP – California Fully Protected Species
CSC – California Species of Special Concern
CSA – This species is included on the California Department of Fish and Game's Special Animals list.
CFP – California Fully Protected Species

California Native Plant Society (CNPS):
1B - CNPS Ranking. Defined as plants that are rare, threatened or endangered in California and elsewhere.
2 - CNPS Ranking. Defined as plants that are rare, threatened or endangered in California, but are more common elsewhere.
Threat Ranks:
0.2 - fairly threatened in California (moderate degree/immediacy of threat)
0.2 – seriously threatened in California (high degree/immediacy of threat)

A rating of "observed" indicates that the species has been observed on either the Main SUMC Site or the Hoover Pavilion Site; "high" indicates that the species has not been observed, but sufficient information is available to indicate suitable habitat and conditions are present on site and the species is expected to occur on site; "moderate" indicates that it is not known if the species is present, but suitable habitat exists on site; "low" indicates that species was not found during biological surveys conducted to date on the site and is not expected, given the species' known regional distribution or the quality of habitats located on the site; and "none" indicates that the species would not be expected to occur in the SUMC Sites because either the SUMC Sites are not within the known range of the species, or there is no suitable habitat present there. Descriptions of each of these species are provided below.

As shown in Table 3.9-1,[1] few of the identified species have suitable habitat in the SUMC Sites and adjacent areas. The CNDDB and USFWS species list is available at the City Department of Planning and Community Environment upon request.

SUMC Sites

Biological Setting. The SUMC Sites include the Main SUMC Site and the Hoover Pavilion Site. The Main SUMC Site is roughly bounded by Sand Hill Road on the north, Welch Road on the east, Quarry Road on the south, and Pasteur Drive on the west. The Main SUMC Site is highly developed with vegetation consisting of formal landscape plantings adjacent to buildings and planting beds; native and non-native trees and shrubs around perimeter areas, and tree and shrub plantings in the right-of-way along streets and driveways. Approximately 1,562 trees, including native and non-native ornamental species, have been identified on the SUMC Sites, including 262 coast live oaks and 63 coast redwoods.[2] Additionally, the city-owned right-of-way is planted with a variety of trees ('street trees') in varying degrees of size, health, and structural condition. Covered under Title 8 of the Municipal Code, Trees and Vegetation, street trees would need to be preserved, replaced, or relocated as part of a development project approval.[3] Tree species observed during the December 11, 2007 survey included coast live oak (*Quercus agrifolia*), valley oak (*Quercus lobata*), Chinese pistache (*Pistacia chinensis*), coast redwood (*Sequoia sempervirens*), peppermint gum (*Eucalyptus nicholii*), Monterey cypress (*Cupressus macrocarpa*), junipers (*Juniperus* spp.), strawberry tree (*Arbutus unedo*), glossy privet (*Ligustrum lucidum*), Japanese maple (*Acer palmatum*), Chinese elm (*Ulmus parviflora*), and California sycamore (*Platanus racemosa*).

The Hoover Pavilion portion of the SUMC Sites is bordered by Quarry Road on the north, Palo Road on the east, an unnamed driveway on the south, and Sweet Olive Way on the west. The Hoover Pavilion Site consists of a large medical office building (the Hoover Pavilion) in the center of the parcel, surrounded by parking lots and landscaped beds. Although almost entirely hardscaped,

[1] Table 3.9-1 is not intended to be an all-inclusive list of species that occur in the SUMC Sites and adjacent areas, but contains only special-status species as defined above.

[2] Ray Morneau, Certified Arborist, *Certified Arborist's Tree Inventory for Stanford Medical Center Area Project*, September 2007.

[3] Street trees are predominantly a landscaping, visual element and under managed care. Landscaping impacts are discussed in more detail in Section 3.3, Visual Quality.

landscaping is present with several large mature trees including deodar cedar (*Cedrus deodara*), coast live oak, yew (*Taxus* sp.), coast redwood, and carob (*Ceratonia siliqua*).

Based on the City listing, there are no Heritage Trees on the SUMC Sites. (Heritage Trees are defined under Applicable Plans and Regulations.) However, of the trees described above, 176 coast live oaks and coast redwoods on the SUMC Sites could qualify for protection under the City of Palo Alto's Tree Protection and Management Regulations (see Regulated Trees below). Of these, 60 Protected Trees on the Main SUMC Site and 11 Protected Trees at the Hoover Pavilion Site, for a sum of 71 total Protected Trees, appear to be within or sufficiently close to new building footprint areas or paved areas associated with site reconfiguration such that they may be at risk and affected by SUMC Project construction. Among these Protected Trees are large and highly visible oak specimens in prominent locations. The shrub and ground cover species observed in the Project Vicinity included mock orange (*Pittosporum tobira*), rose (*Rosa* sp.), and pink knotweed (*Polygonum capitatum*).

Of the 71 Protected Trees that may be at risk and affected by the SUMC Project, approximately 23 trees have been determined by the City to have both biological and aesthetic resource characteristics. A "Biological Tree Resource" is a protected category oak or redwood of a certain size as defined in the Palo Alto Municipal Code, Chapter 8.10, Tree Preservation and Management Regulations. An "Aesthetic Tree Resource" is a Protected Tree that is deemed important relative to the SUMC Project, as designated by the Department of Planning and Community Environment or the City Council, because it has one or more of the following qualities: functions as an important or prominent visual feature; contributes to a larger grove or landscape theme; and/or possesses unique character as defined in the designation of Heritage Trees (per Municipal Code Section 8.10.090). These 23 Protected Trees that are both biologically and aesthetically significant would require retention and preservation under the SUMC Project.[4]

Landscaping is well maintained at the SUMC Sites, which limits the likelihood for any native special-status plants to occur, and the vegetation on the SUMC Sites would be of value only to the most urban-adapted wildlife species. Wildlife species observed during the December 11, 2007 survey were very few, and include mourning dove (*Zenaida macroura*), American robin (*Turdus migratorius*), and Brewer's blackbird (*Euphagus cyanocephalus*). A total of 17 species of bats have been recorded to occur on Stanford lands,[5] but only those species identified in the CDFG Special-Animals List are included in Table 3.9-1. Although no bats or evidence of bats was observed around the exterior portion of buildings in the SUMC Sites during the December 11, 2007 survey, habitat for roosting bats in the SUMC Sites occurs in attics and crawlspaces, spaces behind building facades, gaps in parking structures and similar areas, and in tree cavities or loose sections of bark. No streams, channels, or other wetland resources occur in the SUMC Sites, nor are any natural vegetation communities present.

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4 City of Palo Alto Department of Planning and Community Environment, Dave Dockter, Environmental Planner, *SUMC Environmental Impact Report Strategy: How the City will approach evaluation of the Tree Resources in the SUMC Project Area*, memorandum, July 28, 2009.

5 Stanford University Memorandum dated July 28, 2008, from Alan Launer, Ph.D. to Steven Turner titled, "History and scope of databases on species present at Stanford, including discussion of species of conservation concern at the Stanford University Medical Center and Stanford Shopping Center Project Sites."

The nearest stream is San Francisquito Creek, a perennial stream, approximately 0.25 miles north of the Main SUMC Site, and 1,500 feet north of the Hoover Pavilion Site at its closest point. San Francisquito Creek is known to support steelhead, but is not a part of critical habitat for this species. The only species identified in Table 3.9-1 that have potential to occur in the SUMC Sites are Cooper's hawk and special-status bats.

Cooper's Hawk

Cooper's hawk (*Accipiter cooperii*) is a breeding resident throughout most of the wooded portion of the state with populations increasing during the winter months due to migrants coming from the north. This species ranges from sea level to above 9,000 ft and nests in dense stands of live oak, riparian deciduous or other forest habitats, typically near water. This species is seldom found in areas without dense tree stands, or patchy woodland habitat. Suitable habitat for this species is present in the oak and riparian woodlands (for nesting and foraging) and adjacent grasslands (for foraging) in the SUMC Sites and adjacent areas. This species could nest in larger trees within the SUMC Sites and adjacent areas, or in the riparian woodland along San Francisquito Creek, but has not been confirmed or recorded to do so. Disturbance of active nest sites can result in nest abandonment, and the loss of eggs or young.

Special Status Bats

Special-status bat species with potential habitat in the SUMC Sites include the pallid bat (*Antrozous pallida*), long-eared myotis (*Myotis evotis*), little brown bat (*Myotis lucifugus*), Yuma myotis (*Myotis yumanensis*), western red bat (*Lasiurus blossevillii*), and hoary bat (*Lasiurus cinereus*). Pallid bat and little brown bat use hollow trees, caves, and rock crevices for roosting, but may also roost in man-made structures such as mines, old buildings, and bridges if suitable structure and seclusion are available. Long-eared myotis roost in tree cavities and exfoliating bark. Hoary bats and western red bats are solitary, typically roosting in foliage of riparian trees such as cottonwoods and sycamores, though eucalyptus trees are also known to be used. Foraging habitat for bats is variable by species, and generally poorly documented, but typically occurs in open areas near sources of water or other features that attract flying insects (e.g., street lights, livestock yards, agricultural fields, etc.). Although potential habitat for these species is present within the SUMC Sites and adjacent areas, none of these species have been confirmed to occur therein. Bats will use day, night, and maternity roosts (usually at different locations). Most species, with the exception of red and hoary bats, roost in colonies of varying sizes. Bats are most vulnerable to disturbance in their maternity roosts, but can easily become disoriented and are very susceptible to predation if flushed from their day roost.

Applicable Plans and Regulations

This section describes the federal, State, and local regulations and policies that are applicable to the SUMC Project.

Federal

Federal Endangered Species Act. The Federal Endangered Species Act (FESA) was enacted in 1973. Under the FESA (16 U.S.C. §§ 1531 et seq.), the Secretary of the Interior and the Secretary of Commerce jointly have the authority to list a species as threatened and to designate protected "critical habitat" for listed species. The FESA is administered by both the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration (NOAA Fisheries) and the USFWS. NOAA Fisheries is accountable for animals that spend most of their lives in marine waters, including marine fish, most marine mammals, and anadromous fish such as Pacific salmon. The USFWS is accountable for all other federally listed plants and animals.

Pursuant to the requirements of the FESA, a federal agency that undertakes, funds, or approves a project (which includes the issuance of a license or permit for a non-federal project) must determine whether the project may affect listed species or designated critical habitat. If so, pursuant to section 7 of the FESA, the federal agency must consult with NOAA Fisheries and/or the USFWS, as appropriate, to ensure that the project will not jeopardize the species' continued existence or result in the adverse modification of designated critical habitat. The consultation process can be informal, resulting in a determination that the project is not likely to adversely affect listed species or critical habitat, or it can be formal, resulting in the issuance of a biological opinion including reasonable and prudent measures to minimize adverse impacts to protected species and critical habitat.

Projects that would result in a "take" of any federally-listed threatened or endangered species are required to obtain authorization from NOAA Fisheries and/or USFWS, as appropriate. Under the FESA definition, "take" means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Authorization for a "take" is obtained through one of two processes, depending on whether a federal agency is involved in carrying out, funding, or permitting the project. For projects with such a federal nexus, take authorization is provided through an "incidental take statement," which is typically included as a part of a biological opinion issued after completion of the formal section 7 consultation process described above. For projects without a federal nexus, the project proponent must obtain an "incidental take permit" issued under section 10(a) of the FESA, which requires completion of a habitat conservation plan.

Federal Clean Water Act. The objective of the Federal Water Pollution Control Act, also known as the Clean Water Act (CWA) (33 U.S.C. §§ 1251 et seq.), is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The CWA is also discussed in Section 3.11, Hydrology.

Section 404 of the CWA regulates activities that involve a discharge of dredged or fill material into waters of the United States. The United States Army Corps of Engineers (Corps) is responsible for issuing permits for discharges covered by Section 404, including the filling of wetlands. The Corps emphasizes avoiding and minimizing impacts to wetlands, where feasible. When impacts to wetlands cannot be avoided, compensatory mitigation is generally required as part of the Section 404 permit process to ensure there is no net loss of wetlands values and functions.

Section 401 of the CWA is administered by the State Water Resources Control Board (SWRCB). Under Section 401, an applicant for a federal permit, such as a Section 404 permit (to discharge dredged or fill material into waters of the United States), must obtain a "water quality certification" from the appropriate state agency stating that the permitted activity is consistent with the State's water quality standards and criteria. The San Francisco Bay Regional Water Quality Control Board (SFRWQCB) is the appointed authority for Section 401 compliance in the Bay Area. For projects requiring a Section 404 permit, a request for a water quality certification is submitted to the SFRWQCB at the same time that the Section 404 permit application is filed with the Corps.

Migratory Bird Treaty Act. The federal Migratory Bird Treaty Act of 1918 (16 U.S.C. §§ 703 et seq.) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

State

California Endangered Species Act. The California Endangered Species Act (CESA) (Cal. Fish & Game Code §§ 2050 et seq.) was enacted in 1984. Under the CESA, the California Fish and Game Commission (CFGC) has the responsibility for maintaining a list of threatened and endangered species. CDFG also maintains lists of species of special concern to focus attention on those species that may be at risk but that are not formally listed as threatened or endangered. The CESA prohibits the "take" of any state listed threatened or endangered species, unless the take is authorized by the CDFG. Under the CESA definition, "take" means to "hunt, pursue, catch, capture or kill, or attempt to hunt, pursue, catch, capture or kill." Thus, unlike the FESA, the CESA's definition of "take" does not include actions that only "harass" or "harm" a listed species. Further, unlike the FESA, the CESA does not provide protections for critical habitat.

For species listed under both the FESA and CESA, the CDFG is authorized to rely on a federal incidental take authorization for purposes of authorizing an incidental take under the CESA. For species listed only under the CESA, an incidental take permit must be obtained from the CDFG.

Fish and Game Code - Sections 3503, 3503.5, 3513. Fish and Game Code Section 3503 states that it is unlawful to take, possess, or needlessly destroy the nests or eggs of any bird, except as otherwise provided under the Fish & Game Code or its implementing regulations. Fish and Game Code Section 3503.5 protects all birds-of-prey (raptors) and their eggs and nests. Section 3513 states that it is unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act.

Fish and Game Code Sections 3511, 4700, 5050, and 5515. Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) of the California Fish and Game Code designate certain species as "fully protected." Fully-protected species may not be taken or possessed at any time, and the CDFG may not issue a permit for, or otherwise authorize, the take of such species, except for very limited purposes such as necessary scientific research.

CEQA Guidelines Section 15380. Although threatened and endangered species are protected by specific federal and State statutes, CEQA Guidelines section 15380(b) provides that a species not listed on the federal or State list of protected species may nevertheless be considered for CEQA purposes to be endangered, threatened, or rare, if the species can be shown to meet certain criteria. These criteria allow a public agency, when reviewing a project under CEQA, to undertake a review to determine if a significant effect on species that have not yet been listed under either the FESA or the CESA (such as a CDFG species of concern) would occur.

California Native Plant Society. The CNPS maintains an inventory of special-status plant species. CNPS maintains four species lists of varying rarity. Vascular plants listed as rare or endangered by the CNPS, but which have no designated status or protection under federal or State-endangered species legislation, are defined as follows:

List 1A Plants Believed Extinct.

List 1B Plants Rare, Threatened, or Endangered in California and elsewhere.

List 2 Plants Rare, Threatened, or Endangered in California, but more numerous elsewhere.

List 3 Plants about Which More Information is Needed - A Review List.

List 4 Plants of Limited Distribution - A Watch List.

Threat Ranks:

0.1 - seriously threatened in California (high degree/immediacy of threat)

0.2 - fairly threatened in California (moderate degree/immediacy of threat)

0.3- not very threatened in California (low degree/immediacy of threats or no current threats known)

In general, plants appearing on CNPS List 1 or 2 are considered to meet CEQA Guidelines section 15380 criteria.

Local

Regulated Trees in Palo Alto:[6] Palo Alto Tree Preservation Ordinance, Zoning Ordinance. Title 8, Trees and Vegetation, of the Municipal Code governs two categories of Regulated Trees (Protected and Heritage Trees, Chapter 8.10, and Street Trees, Chapter 8.04) that occur on public or private property. Chapter 18.76.020 of the Municipal Code applies to all natural features, requiring the

[6] Overview of Regulated Trees in Palo Alto, Dave Dockter, online at: http://www.cityofpaloalto.org/environment/urbancanopy/orverviewofregulatedtrees, accessed December 2007.

Architectural Review Board to determine whether such features have been appropriately preserved and integrated with the project. Regulated Trees include those in the following three categories:

- *Protected Trees*. Includes all coast live oak or valley oak trees that are 11.5 inches or greater in diameter, coast redwood trees 18 inches or greater in diameter at breast height (dbh), plus Heritage Trees designated by the City Council according to any of the following provisions: it is an outstanding specimen of a desirable species; it is one of the largest or oldest trees in Palo Alto; or it possesses distinctive form, size, age, location, and/or historical significance.

- *Public Street Trees*. Also protected are City-owned street trees (all trees growing within the street right-of-way, outside of private property). Because street trees are primarily a landscaping, visual feature rather than a sensitive biological resource, they are not described in detail in this section.

- *Designated Trees*. Designated trees are established by the City when a project is subject to the discretionary design review process by the Architecture Review Board (ARB). Under Municipal Code Chapter 18.76.020(d)(11), part of this review includes findings on "whether natural features are appropriately preserved and integrated within the project." An amenity tree or grouping of trees may be "designated" if it has a particular significance because of its function as a unique natural or other feature that contributes to the existing site, neighborhood, or community. Designated trees may be established by the City if a project is subject to the discretionary design review process, such as Architectural Review. Designated trees at the SUMC Sites include the Protected Trees determined by the City to have both biological and aesthetic resource characteristics.

Tree Preservation and Management Regulations. The Palo Alto Tree Preservation Ordinance is the City's primary regulatory tool to provide for orderly protection of specified trees located on private property within the City, and the establishment of standards for removal, maintenance, and planting of trees.

For most development projects within the City of Palo Alto, discretionary or ministerial, a *Tree Disclosure Statement* (TDS) is part of the submittal checklist to establish and verify whether any Protected Trees exist on the site, as well as the location of other trees on the site, trees that overhang the site originating on an adjacent property, and trees that are growing in the adjacent public right-of-way within 30 feet of the area proposed for development. For each project where the TDS indicates that a *Tree Survey* is required (for multiple trees), when a *Tree Preservation Report* is required (any development within the dripline of a Regulated Tree), the TDS will disclose the presence and location of Protected Trees. The *City of Palo Alto Tree Technical Manual*[7] (Tree Technical Manual) describes required reporting procedures and standards to preserve Regulated Trees, including:

- The protection of trees during construction;

- If allowed to be removed, the acceptable replacement strategy;

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7 City of Palo Alto, *City of Palo Alto Tree Technical Manual*, Dave Dockter. June 2001. Provided online at http://www.cityofpaloalto.org/environment/urbancanopy/treetechnicalmanual.

- Maintenance of Protected Trees (such as pruning guidelines);
- Format and procedures for tree surveys and tree preservation reports; and
- Criteria for determining whether a tree is a hazard.

The ordinance requires certain information about existing trees to be submitted with applications for building and other permits:

- Site plans must show the trunk diameter and accurate dripline of oaks, redwoods, and designated trees, as well as the location of all trees with a diameter of 4 inches or greater.
- If there is disturbance within a regulated tree dripline, an arborist's assessment and protection measures must be provided with the application.

Under the City's Ordinance, Municipal Code section 8.10.050, removal of the trees in the "Protected Trees" category would be prohibited for these projects unless one of the following circumstances exists:

- The tree is dead, hazardous, is a detriment to or crowding an adjacent Protected Tree, or constitutes a public nuisance under Section 8.04.050 (2).
- Retention of the tree would reduce the otherwise allowed building area by more than 25 percent.

Removal of a Protected Tree that meets one of these criteria is subject to the City's discretion and would require, if allowed, a permit and replacement or relocation of removed Protected Trees.

Owners of Protected Trees are required to follow certain standards for maintenance and protection during construction activity: Pruning of more than 25 percent of the crown within one calendar year or unbalancing the tree is prohibited.

Stanford University Habitat Conservation Plan (Draft). Stanford has initiated the development of a draft Habitat Conservation Plan[8] (HCP) in support of permit applications for incidental take on proposed covered species during proposed development on University-owned lands. The HCP proposes a conservation strategy to minimize and mitigate those impacts on each covered species to the maximum extent practicable. Components of a conservation program are now under consideration by the USFWS and NOAA Fisheries.

Under the draft HCP, Stanford University has divided its 8,180 acres into four zones according to their relative habitat value for the covered species. Zone 1 (approximately 1,150 acres) supports, or provides critical resources for, one or more covered species. Zone 2 (approximately 1,260 acres) is occasionally occupied by, or occasionally provides some of the resources used by, one or more covered species. Zone 3 (approximately 2,500 acres) consists of generally undeveloped open space lands that have some biological value, but provide only limited and indirect benefit to the covered species. Zone 4 (approximately 3,270 acres) consists of developed areas that do not provide any habitat value for any

[8] 53467 Federal Register / Vol. 71, No. 175 / Monday, September 11, 2006.

covered species. The draft HCP identifies alternatives considered by Stanford University and explains why those alternatives were not selected. To mitigate unavoidable impacts on proposed covered species from covered activities, the mitigation program would consist mainly of preserving large areas of the highest quality habitats and managing them for the benefit of the covered species. To ensure that mitigation precedes impacts, Stanford University would designate several large preserve areas during the planning process and apply preservation ''credits'' against land development and related impacts over the course of the HCP. Stanford University would also restore habitat values in certain areas in which habitat quality has been degraded over time through a variety of land uses. This HCP is in the first phase of the process, and the HCP is now being developed, but has not yet been adopted. However, the SUMC Site and Hoover Pavilion site would be located in Zone 4 because they do not provide any habitat value for covered species.

Impacts and Mitigation Measures

Standards of Significance

Based on significance thresholds determined by the City of Palo Alto, the SUMC Project would result in a significant biological resource impact if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, including federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Result in a substantial adverse effect to any "protected tree" as defined by the City of Palo Alto's Tree Preservation Ordinance (Municipal Code Section 8.10); or
- Conflict with any applicable habitat conservation plan or natural community plan.

Methodology

The Existing Conditions discussion was developed by reviewing available information on special-status species known to occur or with potential to occur in the SUMC Sites. This review was supplemented with a field survey on December 11, 2007 to determine if any special-status species or their potential habitats are present in the SUMC Sites. The information review included:

1. A query of the CNDDB and USFWS species list databases for the Palo Alto, Mountain View, Cupertino, Mindego Hill, La Honda, Woodside, San Mateo, Redwood Point, and Newark 7.5 minute USGS quadrangle maps; and

2. A review of the habitat requirements of the special-status species determined to have potential to occur in the project site through the above queries.

Results of the CNDDB and USFWS queries are provided at the City Department of Planning and Community Environment upon request. A list of species likely to occur in and/or be affected by the SUMC Project was derived from the CNDDB and USFWS database queries, and is provided in Table 3.9-1. As stated in the above Existing Conditions discussion, species that either have no suitable habitat in the SUMC Sites, or their known range does not include the SUMC Sites, are not addressed in this document.

Potential impacts of the SUMC Project on these resources were identified by first comparing the habitat requirements of those species identified during the above review to the habitat available on and adjacent to the SUMC Sites. A determination was then made as to what effect the loss of that potential habitat could have on those species.

Environmental Analysis

BR-1. Impacts on Special-Status Plant or Wildlife Resources. The SUMC Project could have a significant impact on special-status wildlife resources. (S)

The SUMC Sites are highly developed and are comprised entirely of existing medical and education facilities. The only vegetation present within the SUMC Sites includes formal landscape plantings adjacent to buildings and planting beds (e.g., native and non-native trees, shrubs around perimeter areas, and tree and shrub plantings in the right-of-way). There is no native habitat to support special-status plant species, and thus none of the plants listed in Table 3.9-1 were found to have potential to occur on site. There are no streams, channels, or other wetlands present in the SUMC Sites. The SUMC Sites are surrounded by heavily traveled roadways and additional commercial and residential development which separates the sites from areas of natural habitat in the region. Although steelhead and potentially salt marsh common yellowthroat occur along San Francisquito Creek, this drainage lies outside the SUMC Project boundaries, and would not be affected by the SUMC Project. The SUMC Sites do not support habitat for the majority of special-status animals evaluated for their potential to occur on site (Table 3.9-1). Species that were determined to have potential to occur on site include several special-status bat species, which may utilize trees or structures for roosting, and Cooper's hawk, which may nest in mature oaks. Removal of trees and removal of or modification to buildings containing active bat roosts, particularly during the maternity season (typically April through August), could result in the loss of individual bats, bat colonies, or their habitat. Additionally, removal of trees occupied by Cooper's hawk during the nesting season could result in nest failure and the loss of young. Therefore, implementation of the SUMC Project could have a significant impact on special-status bats and Cooper's hawk.

MITIGATION MEASURES. Mitigation Measures BR-1.1 through BR-1.5, below, to be implemented by the SUMC Project sponsors, would reduce the SUMC Project's impact on special-status bats and Cooper's hawk to a less-than-significant level. (LTS)

BR-1.1 *Conduct Pre-Demolition Survey*. The SUMC Project sponsors shall retain a qualified biologist ("bat biologist") to conduct a pre-construction survey for roosting bats in trees to be removed or pruned and structures to be removed. If no roosting bats are found, no further mitigation is required. If a bat roost is found, the SUMC Project sponsors shall implement the following measures to avoid impacts on roosting bats.

BR-1.2 *Avoid Roosting Areas*. If non-breeding bats are found in a tree or structure to be removed, the individuals shall be safely evicted, under the direction of a qualified bat biologist, by opening the roosting area to allow airflow through the cavity. Demolition should then follow at least one night after initial disturbance for airflow. This action should allow bats to leave during darkness, thus increasing their chance of finding new roosts with a minimum of potential predation during daylight.

If active maternity roosts are found in structures that will be removed as part of project construction, demolition of that structure shall commence before maternity colonies form (generally before March 1) or after young are flying (generally by July 31).

BR-1.3 *Develop and Employ Bat Nest Box Plan*. If special-status bats are found in structures to be removed, the SUMC Project sponsors shall develop a bat nest box plan for the SUMC Sites employing state-of-the-art bat nest box technology. The design and placement of nest boxes shall be reviewed by a qualified bat biologist.

BR-1.4 *Avoid Tree Removal During Nesting Season*. Tree removal or pruning shall be avoided from February 1 through August 31, the nesting period for Cooper's hawk, to the extent feasible. If no tree removal or pruning is proposed during the nesting period, no surveys are required.

BR-1.5 *Protect Cooper's Hawk in the Event of Nest Discovery*. If tree removal or pruning is unavoidable during the nesting season, the SUMC Project sponsors shall hire a qualified biologist to conduct a survey for nesting Cooper's hawk within five days prior to the proposed start of construction. If active Cooper's hawk nests are not present, project activities can take place as scheduled. The qualified biologist shall visit the site daily to search for nests until all nesting substrates are removed. This will avoid impacts to Cooper's hawk that may have moved into the SUMC Sites and initiated nest-building after the start of tree removal activities. Additionally, if more than five days elapses between the initial nest search and the tree removal, it is possible for new birds to move into the construction area and begin building a nest. If there is such a delay, another nest survey shall be conducted. If any active

Cooper's hawk nests are detected, the SUMC Project sponsors shall delay removal of the applicable tree or shrub while the nest is occupied with eggs or young who have not fledged. A qualified biologist shall monitor any occupied nest to determine when the Cooper's hawk nest is no longer used.

BR-2. Loss of Riparian or Other Sensitive Habitats, Including Wetlands as Defined by Section 404 of the Clean Water Act. Construction of the SUMC Project would have a less-than-significant impact on riparian or other sensitive habitat resources, including wetlands. (LTS)

The SUMC Sites are developed with medical and research facilities. Vegetation in the SUMC Sites consists entirely of formal landscape plantings adjacent to buildings and planting beds; (e.g., native and non-native trees and shrubs around perimeter areas, and tree and shrub plantings in the right-of-way). Although some of the trees and shrubs used in the landscaping are native to the surrounding region, they do not represent naturally occurring plant communities, and are therefore not considered part of any sensitive habitat areas. No creeks or other drainages traverse the SUMC Sites, nor are there any undeveloped parcels within the SUMC Sites that could support any other wetland resources. Additionally, no riparian or other sensitive habitats, including wetlands as defined by Section 404 of the Clean Water Act, are present on, or immediately adjacent to, the SUMC Sites. The closest stream and riparian habitat is San Francisquito Creek, which is 0.25 miles away from the Main SUMC Site, and 0.3 miles north of the Hoover Pavilion Site at its closest point. San Francisquito Creek is considered protected waters of the United States, but SUMC Project construction activities would not encroach on the creek or its floodplain. Therefore, no direct impacts would occur to San Francisquito Creek as a result of implementation of the SUMC Project.

There would be a potential for a temporary increase in the amount of impervious surfaces on the SUMC Sites during the approximately 12-year construction period, thereby potentially increasing the rate, volume, or duration of runoff flow from the SUMC Sites and hence, bed and bank erosion or sedimentation of San Francisquito Creek. Section 3.11, Hydrology, provides a more detailed description of this potential impact. However, due to the distance from the creek, and its separation from it by existing hardscapes, landscaped areas, and Sand Hill Road, it is unlikely that surface runoff or sedimentation from SUMC Project construction could reach the creek in a substantial enough quantity to cause significant fill of the San Francisquito Creek channel or affect riparian vegetation. Additionally, mitigation measures and Best Management Practices (BMPs) detailed in Section 3.11, Hydrology, would further reduce the potential for loss of riparian or wetland habitats due to sedimentation and erosion. Therefore, implementation of the SUMC Project would have a less-than-significant impact on riparian or other sensitive habitats, including wetlands as defined by Section 404 of the Clean Water Act.

BR-3. Interference with the Movement of Any Native Resident or Migratory Fish or Wildlife Species or with Established Native Resident or Migratory Wildlife Corridors, or Use of Native Wildlife Nursery Sites. The SUMC Project would have no impact on the movement of any native resident or migratory fish or wildlife species, or use of native resident or migratory wildlife corridors, *but could impede the use of native wildlife nursery sites and thus result in a significant impact. (S)*

The SUMC Sites consist principally of long established suburban development and ornamental landscaping, and are surrounded by heavily traveled roadways, and extensive off-site residential, commercial, and other urban development. This setting, and the lack of any creeks or other waterways passing through the site, precludes the opportunity for established wildlife movement corridors in the SUMC Sites. Although steelhead and potentially salt marsh common yellowthroat migrate along San Francisquito Creek, this drainage lies outside the SUMC Sites, and would not be affected by the SUMC Project.

Trees and shrubs found within the SUMC Sites could provide nesting habitat for a wide variety of native birds, and some species, such as black phoebe and swallows, could use buildings for nest sites. Nesting birds, including raptors, are protected by the California Department of Fish and Game Code 3503, which reads, "It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." Passerines and non-passerine land birds are further protected under the Federal Migratory Bird Treaty Act. As such, the CDFG typically recommends pre-construction surveys for potentially suitable nesting habitat that will be directly (actual removal of trees/vegetation) or indirectly (noise disturbance) impacted by construction-related activities. Implementation of the SUMC Project would require tree and/or building removal in preparation for project construction. Building demolition and/or tree and shrub removal or pruning during the nesting season (February 1 to August 31) could result in the loss of active bird nests. The loss of active nests due to building, tree, and shrub removal would be a significant impact.

MITIGATION MEASURES. Mitigation Measures BR-3.1 and BR-3.2, below, would reduce the SUMC Project's impact on nesting migratory birds to a less-than-significant level. (LTS)

BR-3.1 *Avoid Tree Removal During Nesting Season.* Tree or shrub removal or pruning shall be avoided from February 1 through August 31, the bird-nesting period, to the extent feasible. If no tree or shrub removal or pruning is proposed during the nesting period, no surveys are required.

BR-3.2 *Protect Birds in the Event of Nest Discovery.* If tree and shrub removal or pruning is unavoidable during the nesting season, the SUMC Project sponsors shall hire a qualified biologist to conduct a survey for nesting raptors and other birds within five days prior to the proposed start of construction. If active nests are not present, SUMC Project activities can take place as scheduled. The qualified biologist shall visit the site daily to search for nests until all nesting substrates are removed. These procedures would avoid impacts to any birds that may have moved into the SUMC Sites and initiated nest-building after the start of tree and shrub removal activities. Additionally, if more than five days elapses between the initial nest search and the vegetation removal, it is possible for new birds to move into the construction area and begin building a nest. If there is such a delay, another nest survey shall be conducted. If any active nests are detected, the SUMC Project sponsors shall delay removal of the applicable tree or shrub while the nest is occupied with eggs or young who have not fledged. A qualified biologist shall monitor any occupied nest to determine when the nest is no longer used.

BR-4. Result in a Substantial Adverse Effect on any Protected Tree as Defined by the City of Palo Alto's Tree Preservation Ordinance (Municipal Code Section 8.10). The SUMC Project could have a significant impact on Protected Trees. (S)

Approximately 1,562 trees, including native and non-native ornamental species have been identified in the SUMC Sites, including 262 coast live oaks, and 63 coast redwoods.[9] Coast live oaks 11.5 inches dbh or greater, and coast redwoods 18 inches dbh or greater are regulated under the City of Palo Alto's Tree Protection and Management Regulations. Other trees observed during the December 11, 2007 survey included deodar cedar, Monterey cypress, English yew, junipers, eucalyptus, and carob, among others. These trees are distributed throughout the SUMC Sites in landscaping beds throughout the current development (e.g., adjacent to buildings, along streets, and in planting beds). The regulated species described above, in addition to Heritage Trees of any species, are afforded protection under the City of Palo Alto's Tree Preservation and Management Regulations, which prohibit the removal of coast live oaks and valley oak 11.5 inches or more at 4.5 feet above natural grade, coast redwoods 18 inches or more at 4.5 feet above natural grade, or Heritage Tree, except under limited circumstances previously identified under Applicable Plans and Regulations - Local.

Based on the City listing, there are no Heritage Trees on the SUMC Sites. However, there are 176 native oaks and redwoods on the SUMC Sites that are large enough to be designated as Protected Trees under the City of Palo Alto's Tree Preservation and Management Regulations. Protected Trees potentially subject to removal during implementation of the SUMC Project include 60 Protected Trees on the Main SUMC Site and 11 Protected Trees at the Hoover Pavilion Site.[10] These locations appear to be within or sufficiently close to new building footprint areas or areas associated with the site reconfiguration. Thus, it is foreseeable that the loss of up to 71 Protected Trees out of a total of 176 Protected Trees present on the SUMC Sites may occur. Implementation of the SUMC Project could impact Protected Trees during preparation for building construction, or could result in the loss of Protected Trees due to damage sustained during the construction phase of the SUMC Project.

As part of the SUMC Project, the SUMC Project sponsors propose the creation of a new zoning district that could be applied by the City to land uses specifically for hospitals, associated medical research, medical office, and support uses. The new zoning district would have its own name, such as "Hospital District," and would include development standards that

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9 Ray Morneau, Certified Arborist, *Certified Arborist's Tree Inventory for Stanford Medical Center Area Project*, September 2007.

10 Zach Pozner, Stanford University Medical Center, electronic communication to Whitney McNair, subject: "Protected Trees – Stanford," February 8, 2010.

accommodate hospital-related uses like the SUMC Project. As described in Section 2, Project Description, regulations in this district pertaining to Protected Trees would include applicability, preservation, and exemptions for removal and replacement of trees.[11]

The Hospital District zoning requirements would create a procedure to permit the removal of approximately 48 Protected Trees while preserving approximately 23 Protected Trees that are considered both biologically and aesthetically significant, as defined under Existing Conditions. Trees that are determined not to possess these two characteristics would be candidates for an exemption to the City's Tree Ordinance, and required replacement according to the City Tree Technical Manual (TTM) standards. Although the new Hospital District regulations would seek to avoid the removal of 23 Protected Trees that are both biologically and aesthetically significant at the SUMC Sites, 48 Protected Trees could still be removed as a result of the SUMC Project. Municipal Code Section 8.10.050 prohibits removal of a Protected Tree unless it has been determined by the Director of Planning and Community Environment, on the basis of a certified arborist and other relevant information, that the Protected Tree is dead, hazardous, or a detriment to or crowding an adjacent Protected Tree. The Municipal Code protects these trees because they give the City a unique visual character, enhance property values, and provide beneficial environmental services. The 48 Protected Trees that could be removed would not qualify for exemption to the regulations (that is, the trees are neither dead, hazardous, nor a detriment to or crowding an adjacent Protected Tree). Therefore, the SUMC Project would result in a significant impact due to removal of Protected Trees.[12]

Based on the biological and aesthetic resource category designations, the 23 Protected Trees that would be required to be retained under the new Hospital District regulations include: nine Protected Trees in Kaplan Lawn (located between Pasteur Drive), 12 Protected Trees in the area of the proposed SoM FIM 1 building, one Protected Tree located between the site of the Blake-Wilbur Clinic building and Welch Road, and one Protected Tree east of the new LPCH hospital building, along Welch Road.[13] As explained below, minor SUMC Project site plan adjustments could be made to avoid removal of several Protected Trees in the area of the proposed FIM 1 building and along Welch Road (a total of 14 Protected Trees). However, under the SUMC Project, the Protected Trees in the Kaplan Lawn area (nine trees) would not be able to be avoided with minor site plan modifications. As such, the SUMC Project would result in significant impacts to biologically and aesthetically significant Protected Trees in Kaplan Lawn.

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[11] Dave Dockter, Environmental Planner, City of Palo Alto Department of Planning and Community Environment, *SUMC Environmental Impact Report Strategy: How the City will approach evaluation of the Tree Resources in the SUMC Project Area*, memorandum, July 28, 2009.

[12] Dave Dockter, Environmental Planner, City of Palo Alto Department of Planning and Community Environment, *SUMC Environmental Impact Report Strategy: How the City will approach evaluation of the Tree Resources in the SUMC Project Area*, memorandum, July 28, 2009.

[13] Dave Dockter, Environmental Planner, City of Palo Alto Department of Planning and Community Environment, *SUMC Environmental Impact Report Strategy: How the City will approach evaluation of the Tree Resources in the SUMC Project Area*, memorandum, July 28, 2009.

MITIGATION MEASURES. Mitigation Measures BR-4.1 through BR-4.5, below, to be implemented by the SUMC Project sponsors, would reduce the SUMC Project's impact on Protected Trees. In addition, Mitigation Measure BR-4.6 would require minor SUMC Project site plan adjustments to avoid removal of some biologically and aesthetically significant Protected Trees. However, the new Hospital District under the SUMC Project would allow the removal of up to 48 Protected Trees that are protected under the Municipal Code. In addition, minor modifications to the SUMC Project site plans would not be able to avoid the nine biologically and aesthetically significant Protected Trees in the Kaplan Lawn area. Therefore, the SUMC Project would result in a significant and unavoidable impact to Protected Trees. (SU)

BR-4.1 *Prepare a Tree Preservation Report for all Trees to be Retained.* An updated tree survey and tree preservation report (TPR) prepared by a certified arborist shall be submitted for review and acceptance by the City Urban Forester. For reference clarity, the tree survey shall include (list and field tag) all existing trees within the SUMC Sites, including adjacent trees overhanging the SUMC Sites. The approved TPR shall be implemented in full, including mandatory inspections and monthly reporting to City Urban Forester. The TPR shall be based on latest SUMC plans and amended as needed to address activity or within the dripline area of any existing tree to be preserved, including incidental work (utilities trenching, street work, lighting, irrigation, etc.) that may affect the health of a preserved tree. The SUMC Project shall be modified to address recommendations identified to reduce impacts to existing ordinance-regulated trees. The TPR shall be consistent with the criteria set forth in the Tree Preservation Ordinance, Palo Alto Municipal Code Section 8.10.030, and the City Tree Technical Manual, Section 3.00, 4.00 and 6.30.[14] To avoid improvements that may be detrimental to the health of regulated trees, the TPR shall review the SUMC Project sponsors' landscape plan to ensure the new landscape is consistent with Tree Technical Manual, Section 5.45 and Appendix L, Landscaping under Native Oaks.

BR-4.2 *Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks.* The SUMC Project sponsors shall prepare a SAS of Short and Long Term Effects on Protected Oaks. The SAS shall be prepared by a qualified expert team (horticulturalist, architect designer, consulting arborist) capable of determining effects, if any, to foliage, health, disease susceptibility and also prognosis for longevity. The SAS shall provide alternative massing scenarios to provide sufficient solar access and reduce shading detriment at different thresholds of tree health/decline, as provided for in the SAS. The SAS adequacy shall be subject to peer review as determined necessary by the City. The SAS design alternatives shall be the subject of specific discussion at all levels of ARB, Planning Commission, City Council, and public review in conjunction with the SUMC

[14] Palo Alto Municipal Code Section 8.10.030 and the City Tree Technical Manual, Section 3.00, 4.00 and 6.30 is available at: http://www.cityofpaloalto.org/environment/urban_canopy.asp.

Project sponsors, the City Urban Forester, and Director of the Planning and Community Environment Department, until a final design is approved.

BR-4.3 *Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention.* Because of inherent mortality associated with the process of moving mature trees, a Tree Relocation and Maintenance Plan (TRMP) shall be prepared subject to Urban Forester's approval. The SUMC Project sponsors shall submit a TRMP to determine the feasibility of moving the Protected Trees to an appropriate location on site. Feasibility shall consider current site and tree conditions, a tree's ability to tolerate moving, relocation measures, optimum needs for the new location, aftercare, irrigation, and other long-term needs.

If the relocated trees do not survive after a period of five years, the tree canopy shall be replaced with a tree of equivalent size or security deposit value. The TRMP shall be inclusive of the following minimum information: appropriate irrigation, monitoring inspections, post relocation tree maintenance, and for an annual arborist report of the condition of the relocated trees. If a tree is disfigured, leaning with supports needed, in decline with a dead top or dieback of more than 25 percent, the tree shall be considered a total loss and replaced in kind and size. The final annual arborist report shall serve as the basis for return of the Tree Security Deposit (see Mitigation Measure BR-4.4, below, for a discussion of the Tree Security Deposit).

BR-4.4 *Provide a Tree Preservation Bond/Security Guarantee.* The natural tree resources on the SUMC Site include significant Protected Trees and those that provide neighborhood screening, including two trees proposed for relocation. Prior to building permit submittal, the Tree Security Deposit for the total value of the relocated trees, as referenced in the Tree Technical Manual, Section 3.26, Security Deposits, shall be posted to the City Revenue Collections in a form acceptable by the City Attorney. As a security measure, the SUMC Project sponsors shall be subject to a Memorandum of Understanding (MOU) between the City of Palo Alto and the SUMC Project sponsors describing a tree retention amount, list of trees, criteria and timeline for return of security, and conditions as cited in the Record of Land Use Action for the SUMC Project. The SUMC Project sponsors and SUMC Project arborist, to be retained by the SUMC Project sponsors, shall coordinate with the City Urban Forester to determine the amount of bonding required to guarantee the protection and/or replacement of the regulated trees on the site during construction and within five years after occupancy. The SUMC Project sponsors shall bond for 150 percent of the value for the relocated trees, and 50 percent of the value of the remaining trees to be protected during construction (as identified in the revised and final approved Tree Protection Report). The SUMC Project sponsors shall provide an appraisal of the trees with the proposed level of bonding in a tree value table to be reviewed and accepted by the Director of Planning and Community Environment with the description of each tree by number, value, and total combined value of all the trees to be retained. A return of the guarantee shall be subject to an annual followed by a final tree assessment report on all the relocated and retained trees from the SUMC Project arborist, as approved by the City Urban Forester, five years following final inspection for occupancy, to the satisfaction of the Director of the Planning and Community Environment Department.

BR-4.5 *Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category*. There are many publicly owned trees growing in the right-of-way along various frontages (Welch Road, Pasteur Drive, Quarry Road, Sand Hill Road, etc.). These trees provide an important visual and aesthetic value to the streetscape and represent a significant investment from years of public resources to maintain them. As mitigation to offset the net benefits loss from removal of mature trees, and to minimize the future years to achieve parity with visual and infrastructure service benefits (CO_2 reduction, extended asphalt life, water runoff management, etc.) currently provided by the trees, the new public trees on all roadway frontages shall be provided with best practices design and materials, including, but not limited to, the following elements:

- Consistency with the City of Palo Alto Public Works Department Street Tree Management Plan, in consultation with Canopy, Inc.[15]
- Provide adequate room for natural tree canopy growth and adequate root growing volume. For large trees, a target goal of 1,200 cubic feet of soil shall be used.
- For pedestrian and roadway areas that are to include tree planting or adjacent to existing trees to be retained, utilize City-approved best management practices for sustainability products, such as permeable ADA sidewalk surfaces, Silva Cell base support planters, engineered soil mix base, and other advantage methods.

BR-4.6 *Implement Minor Site Modifications to Preserve Biologically and Aesthetically Significant Protected Trees.* The SUMC Project sponsors shall design and implement modifications to building design, hardscape, and landscape to incorporate the below and above ground area needed to preserve as many biologically and aesthetically significant Protected Trees as possible.

15 Canopy, Inc. is a non-profit organization that advises the City with regards to public trees. The City typically interfaces between applicants and the Canopy, Inc., but it is recommended that the SUMC Project sponsors consult with Canopy, Inc. as well.

BR-5. Conflict with any Applicable Habitat Conservation Plan or Natural Community Conservation Plan. The SUMC Project would have no impact on any applicable Habitat Conservation Plan or Natural Community Conservation Plan. (NI)

In September 2006, Stanford University initiated the development of the Stanford University HCP with USFWS and NOAA Fisheries. However, because the Stanford University HCP is currently out for public review and has not been adopted, it is not a currently applicable Habitat Conservation Plan or Natural Community Conservation Plan (NCCP). Until such time that the HCP is adopted, there is no requirement to comply with its provisions. The Santa Clara Valley HCP is the nearest adopted HCP/NCCP in the region, but the SUMC Sites are not included within its boundaries. Because no applicable adopted HCP or NCCP currently exists for the SUMC Sites, and no habitat for special-status plant or wildlife species occurs in the SUMC Sites, the SUMC Project would have no impact on any applicable HCP or NCCP.

Cumulative Analysis

The context for the analysis of cumulative impacts on special-status plant or wildlife comprises portions of the City of Palo Alto, and the Stanford University Community Plan and General Use Permit (CP/GUP) area that are immediately adjacent to the SUMC Sites. Potential project-level impacts on special-status plants and wildlife are limited to special-status bats, Cooper's hawk, and nesting birds. Cumulative development projects within the San Francisquito Creek Watershed may result in cumulative effects on riparian or other sensitive habitats, including wetlands as defined by Section 404 of the Clean Water Act. For cumulative impacts on movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or use of native wildlife nursery sites, the context comprises portions of the City of Palo Alto, adjacent portions of Menlo Park, and the Stanford University CP/GUP area that are immediately adjacent to the SUMC Sites Finally, for cumulative impacts on any Protected Tree as defined by the City of Palo Alto's Tree Preservation Ordinance (Municipal Code Section 8.10), the cumulative context is the City of Palo Alto. The potential cumulative effects are discussed below, based on projections of 2025 cumulative growth identified in Section 3.1, Introduction to Environmental Analysis, and in Appendix B.

The cumulative analysis below focuses on those impacts for which the SUMC Project would have a less-than-significant or significant impact, as determined previously in this section. For those areas where the SUMC Project would have no impact, the SUMC Project would have no potential to contribute to cumulative impacts. The SUMC Project would have no impacts related to special-status plant resources, or habitat conservation plans.

BR-6. Cumulative Impacts on Special-Status Wildlife Resources. The SUMC Project, in combination with other foreseeable development, would have a less-than-significant impact on Special-Status Plant Resources. (LTS)

Reasonably foreseeable probable future development projects in the City of Palo Alto would result in 1,250 new residential units and a decrease of 134,017 square feet of commercial land uses. There is a decrease in net new commercial square footage because Palo Alto is a built-out City and commercial land uses are being converted to residential land uses. Appendix B provides a list and map depicting the locations of the projects within Palo Alto. As shown in Appendix B, most projects in Palo Alto would be located east of El Camino Real, and the only City project in close proximity to the SUMC Project would be the medical building at 777 Welch Road. The High Speed Train (HST) project tracks would also be east of El Camino Real. Cumulative development also includes approved but unconstructed development under the Stanford University CP/GUP area, which would include additional academic facilities, housing units, parking, and associated utilities, roadways and bikeways in the adjacent Stanford University property. The majority of these foreseeable projects would be infill and re-development of existing urban areas and would not substantially affect natural resources, though urban adapted species such as special-status bats and Cooper's hawk could be affected in a similar way as with the SUMC Project. Therefore, there could be a significant cumulative impact on bats and Cooper's hawk.

Construction of the SUMC Project could contribute to a regional loss of urban habitat for special-status bats and Cooper's hawk through the incremental conversion of this habitat to other human uses, and thus limit, at least temporarily, the availability and accessibility of remaining similar urban habitats to these species. However, the size of disturbance within the SUMC Sites would be small from a regional perspective, and any urban habitat lost to redevelopment is likely to be replaced by similar urban habitat that is equally likely to provide habitat for special-status bats and Cooper's hawk. Therefore, the SUMC Project's contribution to the regional loss of urban habitat for special-status bats and Cooper's hawk is less than cumulatively considerable. Additionally, implementation of Mitigation Measures BR-1.1 to BR-1.3 for special-status bats, and Mitigation Measures BR-1.4 and BR-1.5 for Cooper's hawk, would reduce the contribution of the SUMC Project to cumulative impacts on sensitive species.

BR-7. Cumulative Loss of Riparian or Other Sensitive Habitats, Including Wetlands as Defined by Section 404 of the Clean Water Act. Cumulative impacts on riparian or other sensitive habitats could be significant. However, the SUMC Project's contribution to the cumulative impact would be less than cumulatively considerable. (LTS)

As discussed above, reasonably foreseeable probable future projects contemplated in the City of Palo Alto and the Stanford University CP/GUP area would result in additional development. Such additional development could encroach upon previously undeveloped areas adjacent to creeks, or areas that otherwise contain sensitive habitats, including wetlands. The HST tracks would transect San Francisquito Creek, although along an existing Caltrain crossing. Such encroachment could result in the loss of those resources during grading for project construction, and conversion to urban development. Therefore, there could be a significant cumulative impact on riparian or other sensitive habitats, including wetlands as defined by Section 404 of the Clean Water Act.

As stated under BR-2, the SUMC Sites consist of existing medical and research facilities, with formal landscape plantings adjacent to buildings and planting beds (e.g., native and non-native trees and shrubs around perimeter areas, and tree and shrub plantings in the right-of-way), and do not represent naturally occurring plant communities. No creeks or other drainages traverse the SUMC Sites, nor are there any riparian or other sensitive habitats, including wetlands as defined by Section 404 of the Clean Water Act, present there. The closest stream and riparian habitat is San Francisquito Creek, which occurs 0.25 mile away, and is separated from the SUMC Sites by urban development and well traveled roads. Since there are no sensitive habitats including wetlands in the SUMC Sites, the SUMC Project would have no direct impact on San Francisquito creek, and the SUMC Project's contribution to the cumulative loss of this resource would be less than cumulatively considerable. (LTS)

BR-8. Cumulative Interference with the Movement of Any Native Resident or Migratory Fish or Wildlife Species or With Established Native Resident or Migratory Wildlife Corridors, or Use of Native Wildlife Nursery Sites. Cumulative interference with movement of resident or migratory species or with established migratory corridors could be significant. However, the SUMC Project's contribution to the cumulative impact would be less than cumulatively considerable. (LTS)

As discussed above, reasonably foreseeable probable future projects contemplated in the City of Palo Alto, and the Stanford University CP/GUP area would result in additional residential units and academic space and a decrease of commercial land uses. The type of potential habitat for nesting birds (i.e., mature trees and shrubs in landscaped portions of the region) in these areas is similar to that found on the SUMC Sites, and nesting birds could be affected in a similar way as with the SUMC Project. Therefore, there could be a significant cumulative impact on nesting birds.

Construction of the SUMC Project could contribute to a regional loss of urban habitat for nesting birds through the incremental conversion of this habitat to other human uses, and thus limit, at least temporarily, the availability and accessibility of remaining similar urban habitats to these species. However, the size of disturbance within the SUMC Sites is small from a regional perspective, and any urban habitat lost to redevelopment is likely to be replaced by similar urban habitat that is equally likely to provide urban habitat for nesting birds. Therefore, the SUMC Project's contribution to the regional loss of urban habitat for nesting birds is less than cumulatively considerable. Additionally, implementation of Mitigation Measures BR-3.1 and BR-3.2 would reduce the contribution of the SUMC Project to cumulative impacts on nesting birds.

BR-9. Cumulative Impacts on Protected Tree as defined by the City of Palo Alto's Tree Preservation Ordinance (Municipal Code Section 8.10). Cumulative impacts on Protected Trees would be significant. Because the SUMC Project would result in the loss of Protected Trees, the SUMC Project's contribution would cumulatively considerable. (S)

The majority of development projects foreseen within the City of Palo Alto (see Appendix B) are urban infill and redevelopment projects that would impact Protected Trees. Also, the HST project could disturb Protected Trees beyond the existing Caltrain right-of-way. It is unknown how many Protected Trees could be lost to cumulative development. Although the majority of cumulative projects within the City would be required to comply with City of Palo Alto's Tree Preservation Ordinance (Municipal Code Section 8.10), and tree removal would be subject to conditions, including replacement requirements of the ordinance, some loss of Protected Trees could occur. Protected Trees are an important resource to the City and there is no guarantee that all Protected Trees would be saved or relocated. Therefore, the cumulative impact on Protected Trees would be considered significant.

The SUMC Project would result in the loss of potentially and approximately 48 Protected Trees. Moreover, the Protected Trees that would be lost include those identified by the City as being biologically and aesthetically significant Protected Trees. Therefore, although the SUMC Project would be required to comply with the City of Palo Alto's Tree Preservation and Management Regulations, the SUMC Project's contribution to the cumulative loss of Protected Trees would be cumulatively considerable.

MITIGATION MEASURES. Mitigation Measures BR-4.1 through BR-4.6 would reduce the SUMC Project's contribution to cumulative impacts on Protected Trees. However, removal of some Protected Trees, including those identified by the City as being biologically and aesthetically significant Protected Trees, would be unavoidable. As such, the contribution of the SUMC Project to cumulative Protected Tree removal would remain cumulatively considerable. (SU)

3.10 GEOLOGY, SOILS, AND SEISMICITY

Introduction

Geology, soils, and seismicity conditions are important aspects of all development projects in the San Francisco Bay Area region (Bay Area). Although most projects have little or no effect on geology, any project involving construction would have some effect on soils and topography, and all projects may be affected by certain geologic events, such as earthquakes or landslides. Protection from the effects of geologic events is provided through existing building codes and construction standards, land use policies, and State and local regulations.

This section of the EIR describes the regional geologic, soils, and seismic characteristics influencing the SUMC Sites. Local faulting, soils, and the potential effects of seismicity are examined here. Physical and regulatory settings are also presented, followed by an analysis of the potential for geologic, soil, and seismic impacts, based on the City of Palo Alto's thresholds of significance. Erosion and sedimentation issues are considered briefly in this section of the EIR and are addressed more fully in Section 3.11, Hydrology.

The sources of information for this analysis include site observations by a California-registered Professional Geologist; geotechnical conditions maps and reports prepared by or for the United States Geologic Survey (USGS), the California Geological Survey (CGS), the Association of Bay Area Governments (ABAG), the Stanford University Medical Center (SUMC), and the City of Palo Alto; the Natural Environment Element of the City's Comprehensive Plan and analysis in the Comprehensive Plan EIR; the *Stanford University Community Plan*; the Soil Survey of Santa Clara County; and environmental site assessment reports provided by various public and private agencies, each of which is cited in footnotes throughout this section of this EIR. Potential impacts were determined by assessing the SUMC Project's land use change impacts on geologic, soils, and seismic conditions during the design, construction, and operational periods based on the specified significance criteria described under Impacts and Mitigation Measures.

The descriptions of geologic and soil units and conditions in this section of the EIR come from a variety of regional studies and parcel-specific investigations in the SUMC Sites and surrounding areas. The studies and investigations are representative of the geological conditions that exist throughout the vicinity. Although the conditions at the SUMC Sites and surrounding areas are not identical, they are similar enough for the City of Palo Alto to have produced geotechnical, groundshaking, and other seismic hazard maps for the City's Comprehensive Plan, which, combined with the Comprehensive Plan text, are sufficient to provide public agencies and decision-makers with planning-level information about the conditions expected to be encountered in the SUMC Sites. These and similar types of analyses in the Geology and Seismicity chapter of the *2000 Stanford University Draft Community Plan and General Use Permit Application Final Environmental Impact Report* provide background information for this section of this EIR and are referenced or cited in the text or footnotes. Extensive subsurface investigations and sampling programs have been completed for previous development in the

SUMC Sites, as well as for previous development on the SUMC campus. No further subsurface investigation is needed for this EIR. Soils and geologic units that are exposed elsewhere in the City of Palo Alto (beyond the SUMC Sites) are not described in this section of this EIR because they would not undergo physical alteration through implementation of the SUMC Project, nor would they affect the SUMC Project.

Issues identified in response letters to the NOP and during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project were considered in preparing the Geology, Soils, and Seismicity analysis of this EIR. The two comments received that are directly relevant to this section of this EIR requested both information on which portions of the SUMC Project constituted expansion of the existing facilities and an examination of the capacity of local geological materials to support the deeper subsurface levels of the proposed SHC Hospital. Soil and geologic stability issues, including examination of the capacity of local geological materials to support the deeper subsurface levels of the proposed SHC Hospital, are addressed in this section of this EIR.

The comment about access to the Main SUMC Site during a natural disaster (e.g. earthquake) is addressed in Section 3.4, Transportation, in its analysis of impairment of implementation of, or physically interfere with, an adopted emergency response or evacuation plan. The comment about identification of the portions of the SUMC Project that would replace and right-size existing structures to be demolished for seismic safety reasons is addressed in Section 2, Project Description.

Existing Conditions

Regional Area

Topography.[1] The project region is the San Francisco Bay Area. The Santa Clara Plain forms the floor of the Santa Clara Valley, which contains the San Francisco Bay. The plain is a broad, flat to undulating, gently sloping alluvial fan that extends northeast from the base of the foothills of the Santa Cruz Mountains to the salt evaporators that now occupy the marshes that formerly bordered San Francisco Bay. The foothills rise sharply to about 400 feet above mean sea level (+400 feet MSL) west of Junipero Serra Boulevard (about 150 feet MSL). The plain drops gently across 3.5 miles to about +5 feet MSL at the Bay margin and is incised by streams such as San Francisquito Creek, approximately 0.25 mile north of the Main SUMC Site.

Soils.[2] The soils of Santa Clara County belong to five major groups that are further subdivided into 20 soil associations. The major groups are related to the substrate on which the soils have developed. The soil associations are subdivided into soil types based on a variety of distinguishing characteristics, such as texture, slope, and agricultural capability. Only one major group, Group III, is represented in the SUMC Sites. This group is dominated by moderately-well to excessively-drained, medium- to fine-textured soils (sand, silt, and clay) developed on alluvial plains and fans. The soil association in the

1 United States Geological Survey, *Palo Alto Quadrangle*, California, 7.5 Minute Series (Topographic), photorevised 1973, scale 1:24,000.

2 United States Department of Agriculture, Natural Resources Conservation Service (formerly the Soil Conservation Service), *Soils of Santa Clara County, California*, General Soil Map and p. 18, 1968.

SUMC Sites is the Zamora-Pleasanton, which contains loams and clay loams with gravelly clay loam subsoils.

Geology. The regional geologic framework of the San Francisco Bay Area (see Figure 3.10-1), Santa Clara County, and the alluvial plain portion of the City of Palo Alto, which contains the SUMC Sites, can be understood through the theory of plate tectonics. The earth's mantle is composed of several large plates that move relative to each other. The San Andreas Fault Zone is at the junction of two such plates. The Pacific plate, on the west side of the fault zone, is moving north relative to the North American plate on the east side of the fault zone. The geologic formations in Santa Clara County west of the fault zone, which is in the eastern foothills of the Santa Cruz Mountains, are on the Pacific plate; the formations east of the fault zone are on the North American plate. One of the results of plate movement is the regional rock deformation that is expressed in the general northwest trend of valleys and ridges of the Coast Ranges that form the east and west borders of the County. This is visible, for example, in the orientation of Portola Valley in the Santa Cruz Mountains west of the City of Palo Alto and of Santa Clara Valley, which is an extension of the basin forming San Francisco Bay. Another result of plate movement is the seismic activity experienced in the City of Palo Alto and the rest of the Bay Area.[3]

Faults. The City of Palo Alto is in the San Andreas Fault System, which is approximately 44 miles wide in the Bay Area.[4] The principal active faults, those on which there is evidence of displacement during Holocene time (the last 11,000 years), include the San Gregorio, San Andreas, Hayward, Calaveras, and Greenville faults.[5] Figure 3.10-1 shows the approximate position of the major fault zones, the general distribution of the major groups of rock units, and the location of the SUMC Sites in relation to these features. Table 3.10-1 contains the estimated maximum parameters for characteristic earthquakes (see Glossary at the end of this section) on the three known major faults that would cause at least strong groundshaking in the SUMC Sites.

Seismicity. The City of Palo Alto, Santa Clara County, and the rest of the Bay Area are in one of the most active seismic regions in the United States. Each year, low and moderate magnitude earthquakes occurring in or near the Bay Area are felt by residents of the City of Palo Alto. Since the mid-nineteenth century, about 2,000 earthquakes have affected Santa Clara County. The April 1906 earthquake on the San Andreas fault, estimated at about Moment Magnitude (M_W) 7.9 (M8.3 on the Richter scale; see Glossary at the end of this section), probably was the largest seismic event felt in the City of Palo Alto. Most recently, the M_W 6.9 (M7.1) Loma Prieta earthquake of October 1989 on the

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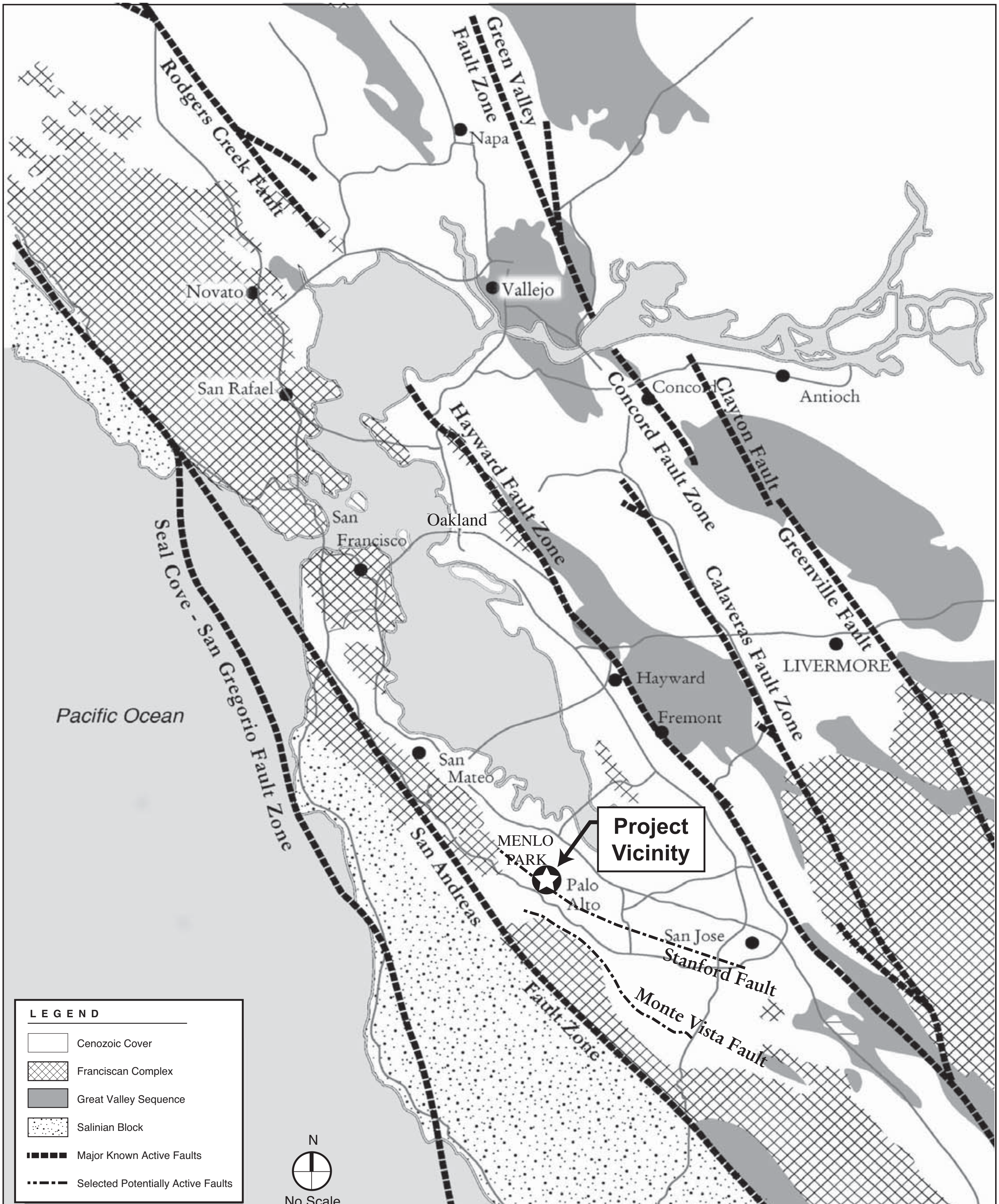
3 Oakeshott, G.B., *California's Changing Landscapes*, A Guide to the Geology of the State, 2nd edition, Chapter 11, The Coast Ranges and Continental Borderland, 1978.

4 Wallace, R.E., "General Features", in Wallace, R.E., ed. *The San Andreas Fault System, California*, U.S. Geological Survey Professional Paper 1515, January 1990.

5 Bortugno, E.J., R.D. McJunkin, and D.L. Wagner, *Map Showing Recent of Faulting, San Francisco-San Jose Quadrangle*, California Geological Survey, Regional Geologic Map Series, No. 5A, 1991, sheet 5, scale 1:250,000.



***Source*:** Stanford Univeristy Community Plan, 2000.

PBSJ

FIGURE 3.10-1

Regional Geologic Map

D41357.00

Stanford University Medical Center Facilities Renewal and Replacement Project

Table 3.10-1 Estimated Maximum Parameters of Three Known Major Faults Affecting the SUMC Sites			
Fault	**San Gregorio**	**San Andreas**	**Hayward**
Moment Magnitude (M_W)[a, b]	7.3	7.9	7.1
Maximum Intensity (MMI)[b]	VI – VIII	≥VIII	VI – VII
Peak Ground Accelerations in Rock and Stiff Soil (Gravity)[c]	0.2 – 0.6	> 0.6	0.2 – 0.4
Approximate Distance and Direction from SUMC Sites to Fault (Miles)[d]	17.5 SW	4.2 SW	14.5 NE

Source: PBS&J, 2008.

Notes:

a. For the purposes of describing the size of the design earthquake of a particular fault segment, moment magnitude (M_W) of the characteristic earthquake for that segment has replaced the concept of a maximum credible earthquake of a particular Richter magnitude. This has become necessary because the Richter Scale "saturates" at the higher magnitudes; that is, the Richter scale has difficulty differentiating the size of earthquakes above magnitude 7.5. The M_W scale is proportional to the area of the fault surface that has slipped, and, thus, is related to the length of the fault segment ruptured and the depth of the hypocenter. Although the numbers appear lower than the traditional Richter magnitudes, they convey more precise (and more useable) information to geologic and structural engineers.

b. Estimated M_W and Modified Mercalli Intensity damage level based on relationships developed by Perkins and Boatwright for the Association of Bay Area Governments, 1995.

c. Estimates based on relationships developed by the USGS ShakeMap Working Group, *Background Information on the ShakeMaps*, webpage last modified 21 April 2003, accessed October 2, 2007.

d. Estimated from Jennings, 1994, scale 1:750,000.

San Andreas fault caused severe damage throughout the Bay Area, including $728 million of property damage throughout Santa Clara County, with one reported death.[6] The earthquake caused $160 million of damage to the Stanford University campus: at least 24 buildings had to be closed temporarily, including the Memorial Church, the main building of the Graduate School of Business, and the Hoover Observation Tower. At least $300 million has been invested to retrofit 140 buildings on the campus. The Stanford University Medical Center was not damaged severely.[7]

There are several other active and potentially active faults that could affect the SUMC Sites. These include faults that are historically active (during the last 200 years – segments of the Green Valley fault and the Concord fault), those that have been active in the geologically recent past (about the last 11,000 years, referred to as the Holocene epoch – segments of the Rodgers Creek, Green Valley, Clayton, Calaveras, and Hayward faults), and those that have been active at some time during the Quaternary geologic period (the last 1.6 million years – segments of the Monte Vista and Stanford faults).

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[6] McNutt, S.R., "Summary of Damage and Losses Caused by the Loma Prieta Earthquake," in: *The Loma Prieta (Santa Cruz Mountains), California, Earthquake of 17 October 1989*, S.R. McNutt and R.H. Sydnor, editors, California Geological Survey, Special Publication 104, 1990.

[7] Yoschak Newsletter, "Stanford Damage," October 1989.; J. Hohmann, "A Century Later: Looking back at the 1906 quake," in: *The Stanford Daily*, April 18, 2006.

A characteristic earthquake on the entire San Andreas fault (M_w 7.9) and on the Peninsula-Golden Gate segment of the San Andreas fault (M_w 7.2) probably are the largest that would affect the SUMC Sites because of their proximity. Other faults that exist in the region are pre-Quaternary in origin. They were active tens of millions of years ago, but have shown no evidence of activity during the last 1.6 million years.[8]

On the basis of research conducted since the 1989 Loma Prieta M_w 6.9 earthquake, the USGS and scientists in other agencies have concluded there is about a 63 percent mean probability of at least one M_w 6.7 or greater earthquake, capable of causing widespread damage, striking the Bay Area region before 2032. The Hayward-Rodgers Creek Fault System[9] has the highest mean probability (31 percent) of generating a M_w 6.7+ earthquake in this timeframe; the mean probability for the San Andreas fault is 21 percent.[10] Earthquakes of this magnitude can create ground accelerations in bedrock and in stiff unconsolidated sediments severe enough to cause major damage to structures and foundations not designed specifically to resist the lateral forces generated by earthquakes and to underground utility lines not designed with sufficient flexibility to accommodate expected seismic ground motion.[11]

The major fault zones in the San Francisco Bay Area, including the faults shown in Figure 3.10-1, are expected to be the sources of most future earthquakes in the Project region.[12] Consequently, it is necessary to design structures and facilities in the City of Palo Alto to withstand the anticipated effects of seismic vibration from distant as well as nearby sources.[13] Recognizing this necessity, the City's Comprehensive Plan establishes policies that ensure the seismic safety of new development (see the Applicable Policies and Regulations section, below).

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8 Jennings, C.W., *Fault Activity Map of California and Adjacent areas, with locations and ages of Recent Volcanic Eruptions*, Geologic Data Map No. 6, California Geological Survey, 1994, scale 1:750,000.

9 The Hayward fault and the Rodgers Creek fault form a continuous system known as the Hayward – Rodgers Creek Fault System that connects under San Pablo Bay. The exact locations of the connecting segments are not known. For the purposes of regional analyses, seismologists consider the system as a whole. For the purposes of local analyses, seismologists consider individual segments within the system. The Hayward fault segments of the system are more active than the Rodgers Creek fault segments.

10 2007 Working Group on California Earthquake Probabilities, *Uniform California Earthquake Rupture Forecast, Version 2,* United States Geological Survey, Open File Report 2007-1437, April 2008, pp. 66 and 74, http://www.scec.org/ucerf/, Online Version updated April 15, 2008, accessed April 22, 2008.

11 a) R.D. Borcherdt, et al., *Map showing Maximum Earthquake Intensity Predicted in the Southern San Francisco Bay Region, California, for Large Earthquakes on the San Andreas and Hayward Faults*, United States Geological Survey, Miscellaneous Field Investigations Map MF-709, 1975, scale 1:125,000.
b) Steinbrugge, K.V., J.H. Bennett, H.J. Lagorio, J.F. Davis, G.A. Borchardt, and T.R. Toppozada, *Earthquake Planning Scenario for a Magnitude 7.5 Earthquake on the Hayward Fault in the San Francisco Bay Area*, California Geological Survey, Special Publication 78, 1987, 12 scenario maps, scale 1:200,000.

12 a) Jennings, 1994.
b) Association of Bay Area Governments, *The San Francisco Bay Area On Shaky Ground*, Publication Number P95001EQK, April 1995, 13 maps, scale 1:1,000,000.

13 Seismology Committee, Structural Engineers Association of California, *Recommended Lateral Force Requirements and Tentative Commentary*, 5th edition, revised June 30, 1998.

The Seal Cove - San Gregorio,[14] San Andreas, Hayward – Rodgers Creek, and Calaveras fault zones are all, at least partially, historically active. Parts of each of these fault zones have been classified as Holocene or Quaternary depending on the evidence of the age of the most recent movement.[15] Other faults in the Project Region that are of concern to the City of Palo Alto and the County include segments of the Monte Vista fault (Late Quaternary - less than 700,000 years ago) near Felt Lake and several traces of the Stanford fault (Early Quaternary – 700,000 to 1.6 million years ago) between the Palm Drive Oval and Junipero Serra Boulevard. Although there is limited evidence for movement along these faults, because their ages overlap those of the major active faults in the region, they are given consideration in the City of Palo Alto and County planning processes.[16]

Surrounding Areas

Topography.[17] The SUMC Sites are on the Santa Clara alluvial plain about 0.8 miles east of the base of the foothills of the Santa Cruz Mountains and about 2.7 miles west of the salt evaporators on the margin of San Francisco Bay. The area in which the SUMC Sites are located is flat to undulating, sloping gently northeast from about +95 feet MSL near the Edwards, Lane, and Alway Buildings to approximately +65 feet MSL at El Camino Real. The SUMC Sites are surrounded on all sides by similar relatively flat topography. The closest "free face," i.e., steep embankment, is the channel wall of San Francisquito Creek.

The only major topographic feature near the SUMC Sites is San Francisquito Creek, which flows north of Sand Hill Road, within 0.25 miles of the Main SUMC Site. The creek banks are up to 25 feet high, very steep, and formed of unconsolidated material. Because of compaction and cementation, the walls have a stiff, dense surface that can remain relatively stable for long periods, if undisturbed. Slumping and sliding are common where undercutting by the creek exposes loose seams of sand and gravel, and where foot traffic has removed vegetation from the banks.[18]

Soils.[19] Only one major soil group is represented in the area in which the SUMC Sites are located: moderately well to excessively drained, medium to fine grained (sand, silt, and clay) soils developed on alluvial plains and fans (Group III soils). The soil association represented is the Zamora-Pleasanton,

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14 The Seal Cove fault and the San Gregorio fault form sub-parallel segments of a larger system known as the Seal Cove – San Gregorio Fault System. For the purposes of regional analyses, seismologists consider the system as a whole. For the purposes of local analyses, seismologists consider individual segments within the system. The San Gregorio fault segments of the system are more active than the Seal Cove fault segments.

15 Jennings, 1994.

16
a) Bortugno, *et al.*, 1991.
b) Santa Clara County Planning Office, "Fault Rupture Hazard Zones" in *County Geologic Hazard Zon*es, on-line version of April 11 2007, accessed March 11, 2008, available at http://www.sccgov.org/portal/site/planning/planningchp?path=%2Fv7%2FPlanning%2C%20Office%20of%20%28DEP%29%2FMaps%20GIS%2FGeologic%20Hazards%20Zones%28Maps%20%26%20Data%29

17 United States Geological Survey, 1973.

18 Site observations, PBS&J geologist, 1981 through 2007.

19
a) United States Department of Agriculture, 1968.
b) California Geological Survey, *Seismic Hazard Zones Palo Alto Quadrangle Official Map*, Released October 18, 2006, Scale 1:24,000.
c) Helley, E.J., et al., *Flatland Deposits of the San Francisco Bay Region, California*. Washington, D.C., United States Geological Survey, Professional Paper 943, 1979, Plate 3,Scale 1:125,000.

consisting of Zamora loam and clay loams with clay loam subsoils and Pleasanton loams with gravelly clay loam subsoils. These loams and clay loams are moderately expansive, moderately corrosive to untreated steel and concrete, with moderate soil strength, low liquefaction potential, low erosion potential, and severe limitations for septic tank filter fields (especially lack of permeability).

Irrespective of the slight liquefaction potential of the surface soils, damaging liquefaction can occur at depth if the water table is within about 50 feet below the ground surface (bgs) in pockets of fine-grained, uniformly sized sand, such as can exist in these alluvial deposits. Conditions such as depth to water table, uniformity of grain size, and mix of grain size, can vary dramatically within alluvial deposits. About two-thirds of the area surrounding the SUMC Sites are in a zone identified by the State Geologist as having some potential for liquefaction. As explained below, adherence to building code requirements ensures that liquefaction potential is addressed during building design and construction.

As with other lowland deposits, erosion hazard for these soils in their natural state is virtually nil. Nonetheless, even soils with low erosion potential in their natural condition can become erosion-prone when disrupted, unless specific measures are taken to control erosion. Because the major adverse effect of potential erosion is sedimentation in drainage ways, this issue is discussed in Section 3.11, Hydrology.

Expansive soils occur in the substrate of the Zamora-Pleasanton association soils. Specific treatments to eliminate expansion of soils include, but are not limited to, grouting (cementing the soil particles together), recompaction (watering and compressing the soils), and replacement with a non-expansive material (excavation of unsuitable soil followed by filling with suitable material), all of which are commonly used in the City of Palo Alto. The California Building Code (CBC), whether administered by the Office of Statewide Health Planning and Development (OSHPD) through the Hospital Facilities Seismic Safety Act of 1983 (HFSSA) or by the City's Municipal Code, requires that each construction location be evaluated to determine the particular treatment, if any, that would be most appropriate. The standards for the correction of expansive soil conditions at buildings considered "health facilities" under HFSSA are identical to those for other structures for human occupancy, but are specified in Chapter 18A of the CBC, rather than Chapter 18 (see Applicable Plans and Regulations, below). If expansive soils need to be excavated and replaced by non-expansive material hauled from other areas, all haul trucks would need to be covered and project-related mud and dirt carried onto paved streets removed daily to comply with Bay Area Air Quality Management District (BAAQMD) requirements to control fugitive dust. Because expansive soils are common throughout the City of Palo Alto, contractors and soil testing firms are familiar with the procedures used to identify and eliminate expansive soil conditions at construction sites. In the case of the SUMC Project, the existence of (1) expansive soils, (2) several well-known remedies for such conditions, and (3) local firms' knowledge of the requirements for, and experience in, dealing with these not-uncommon conditions are part of the physical and legal environment in which the SUMC Project would be implemented.

The provisions of the CBC (Chapter 16.04 of the City's Municipal Code for non-hospital buildings; Section 110 of the CBC for health facilities overseen by OSHPD) are legal requirements: the investigation and treatment of areas suspected of containing expansive soils, through the use of site-specific soil suitability analyses conducted to establish design criteria for appropriate foundation type and support, are standard. The important information for environmental review purposes is not the specific location and exact extent of expansive soils at each potential construction location, but the knowledge that expansive soils may occur throughout the areas surrounding the SUMC Sites, that standard techniques are available for correcting any unsuitable conditions they may engender, and that oversight responsibility for the issue is vested in relevant agencies.

Geologic Units. The soil parent materials in the area surrounding the SUMC Sites are partially exposed in San Francisquito Creek. These parent materials consist of 12 to 15 feet of moderately well-sorted, unconsolidated (non-adhesive), fine sandy silt to clayey silt containing seams and pockets of rounded pebbles and cobbles, overlying at least 6 feet of silty clay.[20] They are part of the younger alluvial deposits on the edge of the Santa Clara Valley, and may be as much as 200 feet thick in areas closer to San Francisco Bay.

Underlying the younger alluvium is the older alluvium of the Santa Clara Formation, partially consolidated clay, silt, sand and gravel deposited more than 11,000 years ago.[21] This unit is thought to be as much as 700 feet thick in the Santa Clara Valley. Numerous geotechnical investigations have been completed in the SUMC Sites and surrounding areas during the past three decades for new structures and renovation or additions to existing structures. The subsurface geological materials encountered in the borings for these investigations reveal the local variations that characterize alluvial fan and alluvial plain deposits. Because these deposits are essentially river sediments, the materials encountered at any given site may reflect deposits from active channel environments, quiet backwater environments, overbank levee conditions, or any of several other different types of stream settings. As a consequence, generalizations about the nature of alluvial deposits underlying relatively large parcels tend to give a somewhat simplified picture of the subsurface conditions. For the most part, the SUMC Sites are underlain by 40 to 50 feet of layered alluvial sediments containing varied proportions of gravel, sand, silt, and clay. Some of the upper layers (within 7 to 10 feet bgs) are soft, but density increases rapidly to the depths explored (20 to 50 feet bgs). The characteristics of alluvial sediments that are of most interest for geotechnical purposes include the density of the deposit, the strength of the materials, the reactivity of the materials, and the presence of groundwater. These characteristics help define the deposit's ability to support the foundations of structures proposed to be built on them. More information about these characteristics at the SUMC Sites is presented below.

Material strength refers to the capability of a soil or geologic unit to resist compaction or compression. Units that are naturally highly compacted and contain relatively high proportions of sand and gravel provide more resistance than loose sandy or clayey soils. An acceptable degree of material strength can be achieved by recompaction or excavation for replacement with non-compressible material to address the specific soil conditions at construction sites. The CBC, whether administered through the

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[20] Site observations, PBS&J geologist, 1981 through 2007.

[21] a) Helley et al., 1979.
b) Brabb, E.E., *Preliminary Geologic Map of the Central Santa Cruz Mountains, California*. Menlo Park, California, United States Geological Survey Open File Map 70-36, 1970. Scale 1:63,500, Sheet 1.
c) Pampeyan, E.H., *Geologic Map of the Palo Alto 7.5 Minute Quadrangle*, Menlo Park, California, United States Geological Survey Open File Report, 1970. Scale 1:24,000.

HFSSA or the City's Municipal Code requires that any correction of weak soil conditions be part of the grading design of the SUMC Project: the standards for the correction of weak soil conditions at health facilities under HFSSA are identical to those for other structures for human occupancy, but are specified in Chapter 18A of the 2007 CBC, rather than Chapter 18.

Faults. There are no known active faults in the area immediately surrounding the SUMC Sites. The known active fault traces closest to the SUMC Sites are those of the San Andreas fault system, about 4.2 miles to the southwest (Figure 3.10-1). This is the only fault in the area that is zoned by the State of California under the Alquist-Priolo Earthquake Fault Zoning Act of 1972 (see below). These traces of the San Andreas fault probably ruptured in the 1906 earthquake, and, therefore, are considered historically active (within the last 200 years). No other earthquake fault zones or known active fault traces cross or trend toward the areas surrounding the SUMC Sites.

Three traces of the Early Quaternary Stanford fault, shown on the County's Geologic Hazards Zones Map, trend across the Stanford University campus south of the SUMC Sites. The fault segments are shown on Figure 7.1 of the *Stanford University Community Plan* (reproduced in this EIR as Figure 3.10-2) as the San Juan Hill fault, which forms a continuous feature with the Stanford fault; the Frenchman's Road fault, which probably is a splinter trace of the Stanford fault; and the Basalt Quarry fault, which is parallel to Junipero Serra Boulevard between Deer Creek and Coyote Creek Roads and may be a splinter trace of the Stanford fault. These faults do not show evidence for recent surface displacements (i.e., during the last 11,500 years) that would cause the State to categorize them as active.[22]

The Stock Farm Monocline (Figure 3.10-2) is a northwest-trending, northeast-facing fold in the Santa Clara Formation and overlying sediments. The fold is expressed as a northeast-facing rise between Page Mill Road and Campus Drive West. This extensively studied structural feature is considered an active fold in the strata. An underlying blind thrust fault is thought to produce the folding. It is not clear whether it is capable of generating earthquakes. Although no surface deformation was recorded on the monocline in 1906 or during the 1989 Loma Prieta earthquake, it is regarded as capable of minor co-seismic ground deformation (that is, deformation that occurs in association with an earthquake on another fault, such as the San Andreas fault).[23]

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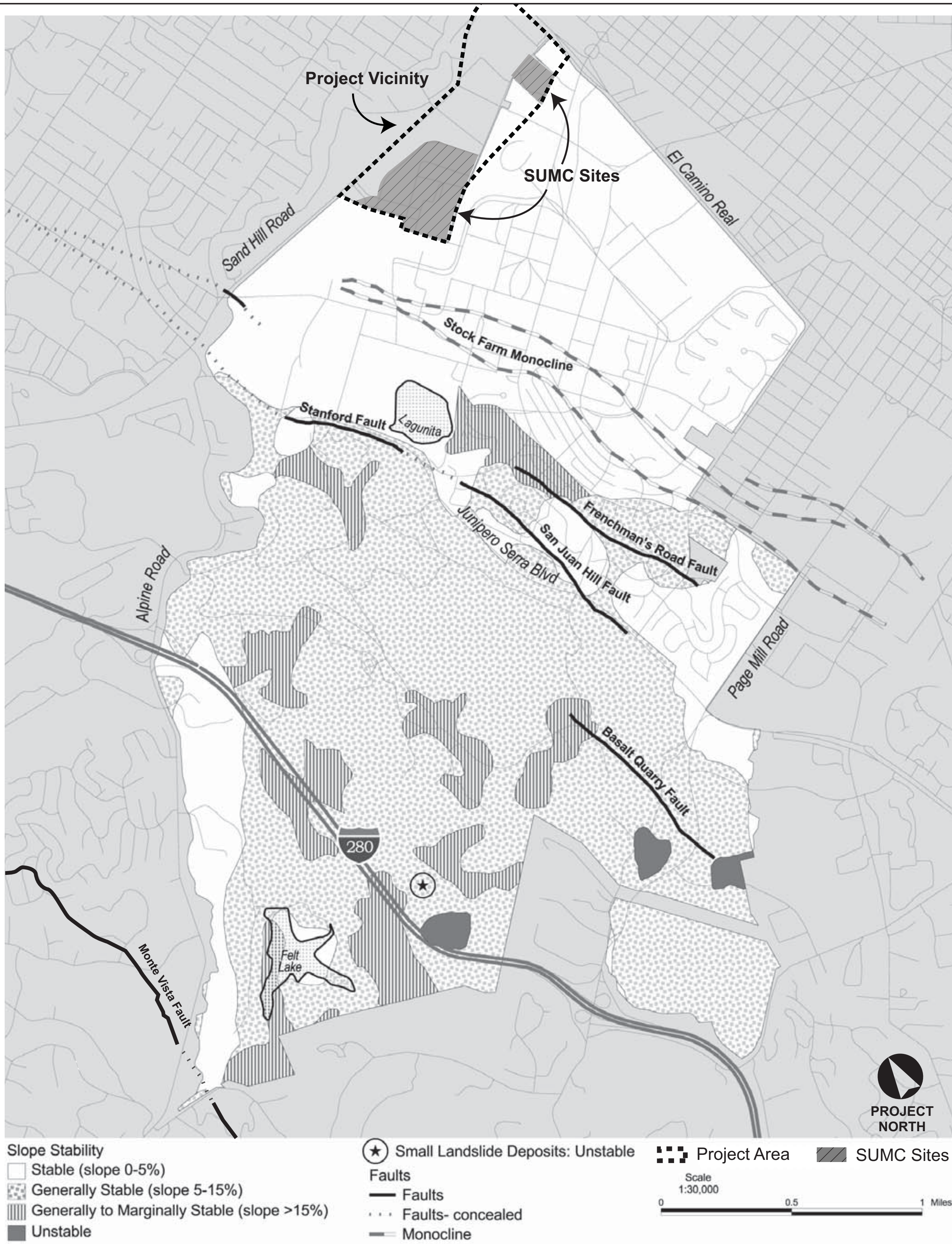
22 *Stanford University Draft Community Plan and General Use Permit Application Final Environmental Impact Report*, Volume I, Chapter 4.6, Geology and Seismicity, December 18, 2000, pp. 4.6-4 through 41.6-77.

23 *Stanford University Draft Community Plan*, 2002, p. 4.6-4.



Source: Stanford Univeristy Community Plan, 2000.

PBS&J

FIGURE 3.10-2
Geologic Features

D41357.00

Stanford University Medical Center Facilities Renewal and Replacement Project

Groundshaking (Seismic Vibration). The San Andreas fault is capable of generating a characteristic earthquake of M_w 7.9 and peak horizontal ground accelerations in excess of 0.6 g (60 percent of the force of gravity) if the epicenter of the earthquake is near the SUMC Sites. Groundshaking intensities associated with this event are expected to be at least VIII on the Modified Mercalli Intensity (MMI) Scale.[24] MMI VIII generally would not damage specially designed structures, but could cause some damage in structures of good workmanship, and moderate to heavy damage in ordinarily substantial buildings, foundations, and underground utilities, such as water pipelines. Seismic ground response of this intensity in the vicinity of the fault trace could cause severe damage to, or destruction of, older buildings, roadways, and infrastructure that were not constructed to resist earthquake forces. For new buildings, roads, and infrastructure constructed to 2007 CBC seismic-resistance standards (as embodied in Palo Alto Municipal Code, Title 16 Chapter 16.04 and in the "A" chapters of the 2007 CBC for health facilities under HFSSA) and/or Caltrans seismic design criteria, using site-specific parameters to address the proximity of the fault, the damage potential is expected to be lower, but still must be considered in the site design (see Applicable Plans and Regulations, below).[25]

Landslides and Slope Stability. Because the area surrounding the SUMC Sites is nearly level, landslides are not considered a hazard in the context of this EIR. Slope stability issues related to the sides of excavations are regulated by the CBC (see Applicable Policies and Regulations).

SUMC Sites

Topography. The Main SUMC Site is a nearly level site that slopes very gently east at less than a one percent grade. The western end of the site (at the Edwards, Lane, and Alway Buildings) is about +95 feet MSL and the eastern end is about +81 feet MSL. The ground surface at the Hoover Pavilion Site is about +72 feet MSL on its west boundary and about +68 feet MSL on its east boundary. The Main SUMC Site is surrounded on all sides by similar relatively flat topography. The closest 'free face,' i.e., steep embankment, is the channel wall of San Francisquito Creek between 560 feet and 1,300 feet north of the Main SUMC Site. Both the Main SUMC Site and the Hoover Pavilion Site are covered with hospital, medical office, and related structures, parking garages, paved parking lots, roads and walks, and small landscaped areas. Consequently, the SUMC Sites contain about 70 percent impervious surfaces: about 30 percent is landscaped.[26]

Soils. All native soils at the Main SUMC Site and about 75 percent of native soils at the Hoover Pavilion Site have been removed or covered with engineered fill to facilitate foundation support. Soils

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24 Earthquake Hazard Map for Palo Alto/Stanford Scenario: Entire San Andreas Fault System in *Earthquake Hazard Maps*, Association of Bay Area Governments website, http://www.abag.ca.gov/bayarea/eqmaps/pickcity.html, updated October 20, 2003, accessed October 2, 2007.

25 a) Greensfelder, R.W., "Seismicity, Groundshaking and Liquefaction Potential," in M.E. Huffman and C.F. Armstrong, *Geology for Planning in Sonoma County*, California Geological Survey, Special Report 120, 1980, pp. 5 through 14.
b) California Seismic Safety Commission, "New Building Element" in *California Loss Reduction Plan, 2002-2006, Mitigation Plan*, http://www.seismic.ca.gov/celrp/sscnewel.htm, updated October 2003.

26 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Figure 4-8a.

at the Main SUMC Site are composed of sand, clay, and gravel.[27] Soils at the Hoover Pavilion Site are composed of a layer of fill (silt, sand, and gravel)[28] underlain by a layers of (1) fluvially deposited sand and gravels with varying amounts of silt at 25 to 35 feet bgs, (2) silt, clay, and clayey sand to approximately 38 to 40 feet bgs, (3) coarse-grained, partially-saturated sand and gravel to approximately 37 to 58 feet bgs, and (4) fine-grained clay and silt to 61 feet bgs.[29]

Geologic Units. Soil parent materials (alluvium) encountered in borings for the parking structure at Quarry and Arboretum Roads consist of 4 to 11 feet of fine to coarse sandy clay and gravel underlain by 10 to 11 feet of clayey sand and gravel with cobbles and about 5 feet of very dense clay. The upper soils are stiff to firm; the lower soils, dense and compacted. Differential compaction, soil collapse, and liquefaction potential are low. At the Main SUMC Site, groundwater was encountered at a depth of more than 50 feet in two bores installed with piezometers. At the SHC, LPCH, and the SoM sites, earth materials encountered are alluvial deposits of two general categories: coarse-grained and fine-grained. The coarser materials are near the ground surface, mostly clayey sand and well graded sand with local silty sand, sandy silt, and gravel lenses. The grain size and density appear to vary both vertically and horizontally. The finer materials are mostly laterally continuous clay-rich layers that vary in thickness and are up to 30 feet thick.[30] With these soil conditions, there is a low potential for liquefaction on a large scale; lateral spreading or compaction settlement; earthquake-induced cyclic softening of fine-grained soils; or seismically induced slope instability.[31] At the Hoover Pavilion Site, the 1982 investigation found that the alluvium extended to at least 32 feet bgs, the upper 20 feet below the sandy surface soil being sandy gravel underlain by at least 12 feet of very stiff fine gravelly clay. No groundwater was encountered. Differential compaction, soil collapse, and liquefaction potential were considered to be within tolerable limits (1/4 to 3/8 inch, i.e., very low).[32] The material characteristics described by these investigation reports are fairly representative of the subsurface conditions throughout the SUMC Sites. Although about 75 percent of the Main SUMC Site is in the State- and County-recognized liquefaction hazard investigation area, the presence of stiff clays and the general lack of groundwater contribute to the site soils' stability. The Hoover Pavilion Site is not in a liquefaction hazard investigation area.

Faults. There are no known active faults on the SUMC Sites. The traces of the Stanford fault and Stock Farm Monocline are between 0.5 and 0.75 miles south of the SUMC Sites.

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27 Rutherford and Chekene Consulting Engineers, *Geotechnical Investigation Final Report, Stanford Hospital & Clinics,* December 24, 2008, p. 11.

28 Rutherford and Chekene Consulting Engineers, *Geotechnical Investigation Hoover Pavilion Seismic Strengthening, Stanford, California*, September 6, 2000, p. 6.

29 Geomatrix, *Phase I Environmental Assessment: Hoover Pavilion 211 and 215 Quarry Road Palo Alto, California*, September 2007. p. 3.

30 Rutherford and Chekene Consulting Engineers, *Geotechnical Investigation Final Report, Stanford Hospital & Clinics,* December 24, 2008, p. 11.

31 Rutherford and Chekene Consulting Engineers, *Geotechnical Investigation Final Report,* Stanford Hospital & Clinics, December 24, 2008, p. 12.

32 Rutherford and Chekene Consulting Engineers, *Soil and Foundation Investigation for the proposed Hoover Pavilion Seismic Upgrading, Stanford University Medical Center,* Stanford, California, January 22, 1982, pp. 4 and 5.

There are several active and potentially active fault zones that could affect the Main SUMC Site. These include faults that are historically active (during the last 200 years), those that have been active in the geologically recent past (about the last 11,000 years, referred to as the Holocene epoch), and those that have been active at some time during the Quaternary geologic period (the last 1.6 million years). The San Gregorio, San Andreas, Hayward, Calaveras, and Greenville fault zones are all, at least partially, historically active. Parts of each of these major fault zones have been classified as Holocene or Quaternary depending on the age of the evidence of the most recent movement. The known active fault traces closest to the SUMC Sites are those of the San Andreas fault, approximately 4.2 miles to the southwest. Active traces of the Hayward fault and San Gregorio fault are approximately 14.5 miles northeast and 17.5 miles southwest of the SUMC Sites, respectively.[33]

The traces of the Stanford fault and Stock Farm Monocline are in the City of Palo Alto, but outside the SUMC Sites. They are shown on the County's Geologic Hazards Zones Map and on the Geologic Features Map of the *Stanford University Community Plan* (see Figure 3.10-2). Although it has not been established that any of these features is capable of generating earthquakes, they are regarded as capable of minor co-seismic ground deformation during earthquakes on other faults in the Project Region.

Groundshaking (Seismic Vibration). A characteristic earthquake on the San Andreas fault (M_W 7.9) probably is the largest earthquake that would affect the SUMC Sites. Characteristic earthquakes on the Hayward fault (M_W 7.1) and the San Gregorio fault (M_W 7.3) would have less effect, but would be damaging. A characteristic earthquake on the San Andreas fault is capable of generating peak ground acceleration at the SUMC Sites higher than 0.6g (60 percent of the force of gravity). The California Geological Survey Probabilistic Seismic Hazards Assessment Program estimates peak ground accelerations at the SUMC Sites could exceed 0.7g. The 2007 CBC (see Applicable Plans and Regulations, below) incorporates attenuation relationships developed by the California Geological Survey's Probabilistic Seismic Hazard Program, which consider vibration contributions from multiple seismic sources. The resultant map (Figure 1613.5(3) of the 2007 CBC) of short term (0.2 second) ground response indicates the SUMC Sites would be subjected to average peak ground accelerations as high as 1.75g for the largest earthquakes in the Bay Area. The 2007 CBC requires the design earthquake (i.e., the maximum considered earthquake acceleration response for a given site) to be calculated using 2/3 of the mapped acceleration value – in this case, about 1.17g. The same procedure is used for all structures for human occupancy in California, whether the seismic design is administered through the HFSSA or the local jurisdiction's Municipal Code.

Groundshaking intensities associated with M_W 7.1 to M_W 7.9 earthquakes are expected to be at least in the range of VII - VIII on the MMI Scale. MMI VIII generally would not damage specially designed structures, but can cause some damage in structures of good workmanship, and moderate to heavy damage in ordinarily substantial buildings, foundations, and underground utilities such as water

[33] a) Hart, E.W., and Bryant, W.A., *Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps*, California Geological Survey, Special Publication 42, revised 1997, Supplements 1 and 2, 1999, Supplement 3, 2003.
b) Jennings, 1994.

pipelines. For new non-hospital buildings, roads, and infrastructure at the SUMC Sites constructed to 2007 CBC seismic-resistance standards (as embodied in Palo Alto Municipal Code Title 16 Chapter 16.04) and/or Caltrans seismic design criteria, using site-specific parameters to address the proximity of the fault, the damage potential is expected to be lower, but still must be considered in the site design (see Applicable Plans and Regulations, below). For new hospital buildings at the SUMC Sites, the California Health and Safety Code requires that every building must not only be designed and constructed to remain standing, but must be designed and constructed to be operational following a major earthquake (see explanation of the HFSSA, below).[34]

Landslides and Slope Stability. Because the SUMC Sites are nearly level, landslides are not considered a hazard in the context of this EIR. Slope stability issues related to the sides of excavations are regulated by the Building Code (see Applicable Policies and Regulations, below).

Applicable Plans and Regulations

Regulations and standards related to geology, soils, and seismicity in the City of Palo Alto are included in State regulations, City ordinances, and plans adopted to protect public health and safety. The following is a brief summary of the regulatory context under which geology, soils, and seismic hazards are managed. Agencies with responsibility for protecting people and property in the SUMC Sites from damage associated with soil conditions and geologic hazards are described below.

Federal Regulations

There are no federal regulations directly applicable to geotechnical conditions in the SUMC Sites. Nonetheless, installation of underground utility lines must comply with industry standards specific to the type of utility (e.g., National Clay Pipe Institute for sewers; American Water Works Association for water lines) and the discharge of contaminants must be controlled through the National Pollutant Discharge Elimination System (NPDES) permitting program for management of construction and municipal stormwater runoff. These standards contain specifications for installation, design, and maintenance to reflect site-specific geologic and soils conditions.

State Regulations

Alquist-Priolo Earthquake Fault Zone. The State legislation protecting the population of California from the effects of fault-line ground-surface rupture is the Alquist-Priolo Earthquake Fault Zoning Act.

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[34] a) "Earthquake Hazard Map for Palo Alto, Scenario: Entire San Andreas Fault System," in *Earthquake Hazard Maps*, Association of Bay Area Governments website, http://www.abag.ca.gov/bayarea/eqmaps/pickcity.html, updated April 28, 2004.
b) "Probabilistic Seismic Hazards, Peak Ground Acceleration Atlas, San Jose 1 x 2 Degree Sheet," in *Probabilistic Seismic Hazard Assessment Maps*, California Geological Survey website, http://www.consrv.ca.gov/cgs/rghm/pshamap/pshamap.asp, last edited February 08, 2005.
c) 2007 California Building Code Figure 1613.5(3).
d) California Health and Safety Code, Division 107 Statewide Health Planning and Development, Part 7 Facilities Design Review and Construction, Chapter 1 Health Facilities, also known as the Alfred E. Alquist Hospital Facilities, Seismic Safety Act 1983 (HSSA 83), Article 8, Sections 130000 through 130025, effective January 1, 2005.

This law was passed in response to the 1971 San Fernando Earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures. At the directive of the Act, in 1972 the State Geologist began delineating Earthquake Fault Zones (called Special Studies Zones prior to 1994) around active and potentially active faults to reduce fault-rupture risks to structures for human occupancy.[35] This Act has resulted in the preparation of maps delineating Earthquake Fault Zones to include, among others, recently active segments of the San Andreas and Hayward faults. The Act provides for special seismic design considerations if developments are planned in areas adjacent to active or potentially active faults.[36] The SUMC Sites are not crossed by an Alquist-Priolo Earthquake Fault Zone delineated along any fault.

Alfred E. Alquist Hospital Facilities Seismic Safety Act of 1983, Senate Bill 1953, and Senate Bill 306. In response to the Sylmar earthquake of 1971, the California Legislature enacted the Hospital Facilities Seismic Safety Act of 1973. The law was amended by the Alfred E. Alquist Hospital Facilities Seismic Safety Act of 1983 (HFSSA), which requires that acute care hospitals[37] be designed and constructed to withstand a major earthquake and ultimately to remain operational immediately after such an event.[38] The HFSSA requires that construction and design plans for acute care hospitals in California be in full compliance with the regulations and standards developed by OSHPD pursuant to the HFSSA. The HFSSA preempts local regulatory authority (i.e., the City Municipal Code) over the design and construction of "health facilities," a category that includes hospital buildings and certain skilled nursing facilities. Under the HFSSA, OSHPD has the authority to review plans and specifications for such buildings, to conduct inspections, and to oversee the design and details of the architectural, structural, mechanical, plumbing, electrical, and fire and panic safety systems.

Following the 1994 Northridge earthquake, Senate Bill 1953 (SB 1953) amended the HFSSA and reinforced the importance of retaining the structural integrity of medical facilities. The initial goal of SB 1953 was that, by December 31, 2007, every general acute care inpatient hospital building in the State would remain standing following a major earthquake. The law was amended to provide for a five-year extension of this deadline, until 2013. A further two-year extension, until 2015, may be granted by OSHPD if, among other specified conditions, the building is under construction at the time the request for an extension is made, the hospital plans are submitted to OSHPD for review by 2009,

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35 Alquist-Priolo Earthquake Fault Zoning Act, California Public Resources Code, Division 2, "Geology, Mines, and Mining," Chapter 7.5 "Earthquake Fault Zones," Sections 2621 through 2630; signed into law December 22, 1972, most recently amended October 07, 1997.

36 Hart and Bryant, 1997 – 2003.

37 Acute care hospitals are traditional hospitals that provide inpatient and outpatient services. Inpatient services are for people admitted to the hospital for care that cannot be provided in a doctor's office or at home, to those who need surgery or specialized procedures and to women giving birth. Outpatient services are provided to individuals who need routine medical care, post-surgery follow-up care and emergency care.

38 The HFSSA does not articulate requirements for specific construction measures, only the standard to which the structures must be built. For example, one of the most common design features in an HFSSA facility is to bolt hospital equipment to the floor. While such a measure is not explicitly required by the HFSSA, it is likely to be one of the safeguards that OSHPD would require before approving construction in any acute care facility.

and the hospital receives a building permit by 2011. By 2030, every "health facilities" building must be designed and constructed to remain standing and be operational following a major earthquake.[39]

The HFSSA, as amended by SB 1953 and other statutes, would require all new hospitals to meet strict seismic safety standards for the design and construction of their general acute care inpatient hospital buildings. The HFSSA requires OSHPD to review all construction plans for acute care facilities to ensure that they meet the HFSSA standards of standing and operational after a major earthquake. The conformance of a project with the HFSSA standards is evaluated by OSHPD on a case-by-case basis. The HFSSA seismic safety standards apply only to the hospital-building portion of a project.[40] Because the SUMC is an acute care facility, the HFSSA requires that buildings that house acute care patients must meet the statute's heightened seismic safety standards by 2013 (or 2015, if a two-year extension is granted) and by 2030. The SUMC Project is designed to bring the hospital facility into compliance with these standards.

In conducting its permitting review for acute care hospital buildings, OSHPD applies a distinct subset of the requirements of the 2007 CBC. These are known as the "OSHPD 1" requirements, which govern comprehensively all aspects of the design and construction of hospital buildings. OSHPD 1 requirements are listed in Section 110.1 of the 2007 CBC. For the most part, they are identical to the standard 2007 CBC requirements, but where they differ (for example in not permitting certain Alternative Seismic Design Category Designations and Simplified Design Procedures, or requiring specific modifications to the American Society of Civil Engineers *Minimum Design Loads for Buildings and Other Structures*), they are detailed in seven chapters of the 2007 CBC: Chapters 16A (Structural Design), 17A (Structural Tests and Special Inspections), 18A (Soils and Foundations), 19A (Concrete), 21A (Masonry), 22A (Steel), and 34A (Existing Structures). For hospital buildings, OSHPD is responsible for ensuring that the HFSSA seismic safety standards are met and for applying and enforcing the OSHPD 1 requirements of the 2007 CBC.

For non-hospital buildings that are physically separate from an acute care hospital, but that are covered by the hospital's license and provide clinical services for outpatients or fulfill other hospital functions (including administrative offices, medical supply or storage areas, etc.), there also is a special subset of the requirements of the 2007 CBC. These are known as the "OSHPD 3" requirements, which govern comprehensively all aspects of the design and construction of these types of non-hospital buildings. OSHPD 3 requirements are listed in Section 110.3 of the 2007 CBC. They are identical to their corresponding chapters of the standard 2007 CBC requirements. For these types of non-hospital buildings, the local jurisdiction (in this case, the City of Palo Alto) is responsible for applying and enforcing the OSHPD 3 requirements of the 2007 CBC, as well as other applicable code requirements, as part of the local building permit process.

Another law, Senate Bill 306, authorizes certain hospital owners meeting specified financial criteria to obtain an extension until January 1, 2020. Based on the requirements of this bill, the SUMC Project

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39 California Health and Safety Code, Sections 130000 – 1300025, 2005.

40 Non-hospital buildings, for example, garages or certain types of affiliated medical office buildings, would be required to meet the standards of the local building code.

sponsors do not believe that the Project qualifies for the 2020 extension. As such, the SUMC Project sponsors do not anticipate pursuing an extension under this bill. The SUMC Project sponsors do, however, anticipate pursuing an extension to 2015, as described in the text above.

Seismic Hazards Mapping Act. The State regulations protecting the public from geo-seismic hazards, other than surface faulting, are contained in California Public Resources Code, Division 2, Chapter 7.8 (the Seismic Hazards Mapping Act) and the 2007 California Code of Regulations, Title 24, Part 2 (the California Building Code). Both of these regulations apply to public buildings, and a large percentage of private buildings, intended for human occupancy.

The Seismic Hazards Mapping Act became effective in 1991 to identify and map seismic hazard zones for the purpose of assisting cities and counties in preparing the safety elements of their general plans and to encourage land use management policies and regulations that reduce seismic hazards. The recognized hazards include strong groundshaking, liquefaction, landslides, and other ground failure. These effects account for approximately 95 percent of economic losses caused by earthquakes. The Act mandated the preparation of maps delineating Liquefaction and Earthquake-Induced Landslide Zones of Required Investigation. Mapping has been completed for the Palo Alto quadrangle, which contains the SUMC Sites, and the official map was issued in October 2006.[41] Because the north half of the SUMC Sites are in a zone identified by the State Geologist as having some potential for liquefaction, the Act requires site-specific geotechnical investigation to identify liquefiable materials and remediate the condition as necessary. This information is reflected in the City's Comprehensive Plan Natural Environment Element goals and policies (see below). The City's enforcement of its Municipal Code, including the OSHPD 3 requirements, would ensure that the design and construction of the buildings associated with the non-hospital portion of the SUMC Project would be consistent with those goals and policies and would comply with the requirements that derive from the Seismic Hazards Mapping Act. The buildings associated with the hospital portion of the SUMC Project would be subject to the jurisdiction of OSHPD, which would be responsible for ensuring compliance with heightened OSHPD 1 seismic safety standards.

California Building Code and City of Palo Alto Building Code. Until January 1, 2008, the CBC was based on the then-current Uniform Building Code and contained Additions, Amendments, and Repeals specific to building conditions and structural requirements in the State of California. The 2007 CBC, effective January 1, 2008, is based on the current (2006) International Building Code and contains prominent enhancement of the sections dealing with fire safety, equal access for disabled persons, and environmentally friendly construction.[42] Cities and counties are required to enforce the regulations of the 2007 CBC beginning January 1, 2008. Each jurisdiction may adopt its own building code based on the 2007 CBC. Local codes are permitted to be more stringent than Title 24, but must, at a minimum, meet all State standards. The City of Palo Alto has adopted the 2007 CBC as the basis for the City Building Code Title 16, Chapter 16.04 of the Municipal Code (Ordinance No. 4976, adopted November 26, 2007). The City's enforcement of its Municipal Code and of the OSHPD 3

[41] California Geological Survey, 2006.
[42] California Building Standards Commission, *2007 California Building Code*, California Code of Regulations, Title 24, Part 2, Volumes 1 and 2, effective January 1, 2008.

requirements, where applicable, would ensure that the design and construction of non-hospital buildings in the SUMC Sites would be consistent with the CBC. The hospital buildings would be subject to the jurisdiction of OSHPD, which would be responsible for ensuring compliance with heightened OSHPD 1 seismic safety standards.

Chapters 16 and 16A of the 2007 CBC deal with Structural Design requirements governing seismically resistant construction, including (but not limited to) factors and coefficients used to establish seismic site class and seismic occupancy category for the soil/rock at the building location and the proposed building design. Chapters 18 and 18A of the 2007 CBC include (but are not limited to) the requirements for foundation and soil investigations (Sections 1802 & 1802A); excavation, grading, and fill (Sections 1803 & 1803A); allowable load-bearing values of soils (Sections 1804 & 1804A); and the design of footings, foundations, and slope clearances (Sections 1805 & 1805A), retaining walls (Sections 1806 & 1806A), and pier, pile, driven, and cast-in-place foundation support systems (Sections 1808, 1808A, 1809, 1809A, 1810 & 1810A). Chapter 33 of the 2007 CBC includes (but is not limited to) requirements for safeguards at work sites to ensure stable excavations and cut or fill slopes (Section 3304). Appendix J of the 2007 CBC includes (but is not limited to) grading requirements for the design of excavations and fills (Sections J106 &J107) and for erosion control (Section J110).

The 2007 CBC requirements incorporate seismically induced vibration contributions from multiple seismic sources, including those generated by nearby faults, as well as those of the more distant, but potentially more damaging, faults. The SUMC Project could be subjected to short-duration average peak ground accelerations as high as 1.75g from the largest earthquakes in the Bay area. The vibration from the design earthquake for the SUMC Sites would be about 1.17g. The exact value would be required to be calculated during the design phase of each proposed structure.

Local Regulations

The City's Comprehensive Plan contains applicable goals and policies related to geo-seismic hazards. All applicable Comprehensive Plan goals and policies are discussed in Section 3.2, Land Use.

City of Palo Alto Municipal Code. The City of Palo Alto has adopted the 2007 CBC as the basis for the City Building Code (Ordinance No. 4976, adopted November 26, 2007). The provisions are embodied in Chapter 16.04 Building Code of the Palo Alto Municipal Code.

Before construction of any proposed project that is subject to the City Building Code, the City of Palo Alto requires a site-specific soils report that identifies any potentially unsuitable soil conditions (such as expansive or compressive soils) and contains appropriate recommendations for foundation type and design criteria including provisions to reduce the effects of expansive soils. The recommendations made in the soils report for ground preparation and earthwork are required to be incorporated in the construction design. The soils evaluations must be conducted by registered soil professionals, and the measures to eliminate inappropriate soil conditions must be applied. The design for soil support of foundations must conform to the analysis and implementation criteria described in the Building Code, Chapters 16, 16A, 18, 18A, and 33 as indicated above. This requirement would be fulfilled by subsurface investigations for the foundations of each new structure proposed in the SUMC Sites.

As noted above, the hospital buildings would be under the jurisdiction and control of OSHPD, which would be responsible for ensuring compliance with heightened seismic safety standards and OSHPD 1 requirements of the CBC.

The City's erosion and sediment control ordinance is contained in Chapter 16.28, Excavations, Grading, and Fills, of the Municipal Code. The SUMC Project would require a Grading and Excavation Permit. All land-disturbing or land-filling activities or soil storage must be undertaken in a manner designed to reduce surface runoff, erosion, and sedimentation to a minimum amount. An interim erosion and sediment control plan and a Stormwater Pollution Prevention Plan (SWPPP) are required and must contain descriptions of surface runoff and erosion control measures to be implemented. The final erosion and sediment control plan and SWPPP must include a description of permanent control measures to improve the quality of stormwater runoff from the sites. Further information about the water quality effects of erosion and sedimentation appear in Section 3.11, Hydrology, of this EIR.

City of Palo Alto Zoning Ordinance. The City's Zoning Ordinance stipulates that detailed geologic and soils investigations be prepared for development in the foothills near Interstate 280, but similar investigations generally are undertaken for major developments anywhere in the City of Palo Alto. Investigations have been performed for previous development proposals in the SUMC Sites, and will be required for the current SUMC Project proposals.

These investigations provide design criteria that ensure structural integrity and public safety of proposed development, particularly during seismic events. Issues addressed include seismic design, slope protection, and on-going engineering/geotechnical review, as well as site preparation, grading, and foundation design, as stipulated in the 2007 CBC and local building regulations. The recommendations of the geologic and soils reports must be incorporated in the design of foundations and buildings. Earthquake-resistant design and materials are required to meet or exceed the current seismic engineering standards of the CBC. For buildings associated with the non-hospital portion of the SUMC Project, the City Public Works Department would review and certify the investigations, ensure that they meet City standards, and City Building Inspectors would ensure that appropriate design measures were incorporated in the SUMC Project. For buildings associated with the hospital portion of the SUMC Project, OSHPD would conduct the reviews necessary for building design, engineering, and construction, in accordance with the OSHPD 1 requirements for hospital buildings.

Impacts and Mitigation Measures

Methodology

The geotechnical characteristics of a project site determine its potential for structural and safety hazards that could occur during construction and/or operation of a proposed project. For the purposes of this EIR, available USGS and CGS topographical and seismic maps, NRCS soils reports, site-specific geotechnical assessments, and other studies that included relevant geologic data, were reviewed and used to determine whether geological impacts would occur from implementation of the proposed project.

The following evaluation illustrates that the design-controllable aspects of building foundation support, protection from seismic ground motion, and soil or slope instability are governed by existing regulations of the State of California or the City of Palo Alto. These regulations require that project designs reduce potential adverse soils, geology, and seismicity effects to less than significant levels. Compliance with these regulations is required, not optional. Compliance must be demonstrated by the project applicant to have been incorporated in the project's design before permits for project construction would be issued.

Standards of Significance

Based on significance thresholds determined by the City of Palo Alto, the Project would result in a significant geologic or seismic impact if it would:

- Expose people or structures to substantial adverse effects including the risk of loss, injury or death involving rupture of a known earthquake fault, strong seismic groundshaking, seismic-related ground failure (including liquefaction), landslides, or expansive soil;
- Expose people or property to major geologic hazards that cannot be mitigated through the use of standard engineering design and seismic safety techniques;
- Be located on a geologic unit or on soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse; or
- Cause substantial erosion or siltation.

Because one of the major effects of loss of topsoil is sedimentation in receiving waters, erosion control standards are set by the State Water Quality Control Board through administration of the NPDES permit process for storm drainage discharge. Erosion and sedimentation issues are addressed in Section 3.11, Hydrology, because they are they are primarily related to turbidity and other depositional effects in local and regional water bodies.

Environmental Analysis

Review of the geologic documents related to the SUMC Project indicates that seismic groundshaking, ground failure, expansive soil, or underground hazards are concerns for the SUMC Sites. The SUMC Project would replace existing structures with new structures, as well as add new structures. One purpose of the SUMC Project is to replace older buildings built prior to modern seismic safety code requirements, with modern buildings constructed to applicable standards in order to reduce geologic hazards to staff, patients, and visitors to the hospital portion of the SUMC Project. The non-hospital portion of the SUMC Project would be required to comply with construction standards and seismic design criteria contained in the 2007 CBC, including the OSHPD 3 requirements where applicable.

The hospital portion of the SUMC Project would be required to meet the heightened safety standards of OSHPD, including the seismic requirements of SB 1953 mandated by the HFSAA. Implementation of these standards and criteria would minimize the risk of loss, injury, or death from seismic events through the requirement that the hospital building remain standing and be operational following a major earthquake. Because the hospital portion of the SUMC Project would be required to conform to current OSHPD 1 standards of the 2007 CBC, it would not create any significant seismic hazards, soil instability hazards, or other hazardous geotechnical conditions. The design of the non-hospital portion of the SUMC Project would be required to meet the standards contained in the current City Building Code (based almost entirely on the 2007 CBC) and, therefore, would not create any significant seismic hazards, soil instability hazards, or other hazardous geotechnical conditions.

Because all aspects of seismic-related hazards, other geotechnical hazards, and erosion and siltation issues are regulated by City or State codes, no mitigation measures are required for the SUMC Project.

GS-1. Exposure to Seismic-Related Hazards. The SUMC Project would have a less-than-significant potential to expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic groundshaking, seismic-related ground failure (including liquefaction), landslides, expansive soil, or major geologic hazards that cannot be mitigated through the use of standard engineering design and seismic safety techniques. (LTS)

The SUMC Sites are not in an Alquist-Priolo Earthquake Fault Zone, nor is there other substantial evidence that known active faults exist beneath the Sites. As such, the provisions of the Alquist-Priolo Earthquake Fault Zoning Act do not apply to the SUMC Project. Because the SUMC Sites are about 4.2 miles from the closest known active fault traces (the San Andreas fault) and at least half a mile from traces of the Stanford fault (no geologically recent activity) and Stock Farm Monocline (suspected potential for co-seismic activity), fault-line surface rupture is not considered a substantial hazard at the SUMC Sites. There is no evidence that any of the ancient faults in the vicinity of the SUMC Sites are active. In view of these circumstances, the SUMC Project would have no impact related to fault rupture hazard.

Design. Review of regional and local geo-seismic conditions indicates that the SUMC Sites probably would be subjected to at least one major earthquake during the life of the existing and proposed buildings. A characteristic earthquake on the San Andreas fault (M_w 7.9) probably is the largest that would affect the SUMC Site, creating estimated peak ground accelerations at the site that could exceed 0.7g. The 2007 CBC requires the seismic-resistant design for the SUMC Project buildings to factor in a design earthquake that would create average peak ground accelerations of at least 1.17g. The amended HFSSA requires that every general acute care inpatient hospital building must be designed and constructed to remain standing and be operational following such an earthquake.

Adherence to the CBC, as adopted by the City of Palo Alto, or administered through the HFSSA, as required by State law, would ensure the maximum practicable protection available for hospital and non-hospital structures on the SUMC Sites. Project design is required to include the application of CBC seismic standards as the minimum seismic-resistant design for the non-hospital portions of the SUMC Project. Design of the hospital portions would be required to meet the seismic safety standards of the HFSSA, as well as the other OSHPD 1 requirements of the 2007 CBC. The applicable City and HFSSA requirements include seismic-resistant earthwork and construction design criteria, based on the site-specific recommendations of the SUMC Project's California-registered geotechnical and structural engineers; engineering analyses that demonstrate satisfactory performance of any unsupported cut or fill slopes, and of alluvium and/or fill where they form part or all of the support for structures, foundations and underground utilities; and an analysis of soil expansion potential and appropriate remediation (compaction, removal-and-replacement, etc.) prior to using any expansive soils for foundation support, as explained in greater detail below.

Adherence to the standard seismic design and construction parameters of the CBC and the specific standards of OSHPD 1, as required by State law, would ensure protection of the SUMC Project's occupants and visitors. Compliance with the CBC includes procedures to ensure protection of structures and occupants from geo-seismic hazards:

- During site preparation, a registered geotechnical professional must be on the site to supervise implementation of the recommended criteria.
- A California Certified Engineering Geologist or California-licensed Civil Engineer (Geotechnical) for the applicant must prepare an "as built" map/report to be filed with the City showing details of the site geology, the location and type of seismic-restraint facilities, and documenting the following requirements, as appropriate.
  a. Engineering analyses demonstrating satisfactory performance of compacted fill or natural unconsolidated sediments where either forms part or all of the support for any structures, especially where the possible occurrence of liquefiable, compressible, or expansive soils exists.
  b. Engineering analyses demonstrating accommodation of settlement or compaction estimates by the site-specific Geotechnical Report for access roads, foundations, and underground utilities in fill or alluvium.

In view of the requirements to comply with the seismic safety requirements of the City and State Building Codes for the non-hospital portions of the SUMC Project, the OSHPD 1 requirements of the 2007 CBC for the hospital portions, and the design recommendations of the SUMC Project's geotechnical report to be included in the project design, the SUMC Project's impact on exposure to seismically-induced groundshaking would be less than significant.

Construction. Although about half the area of the SUMC Sites is in the State- and County-recognized liquefaction hazard investigation area, the presence of stiff clays and the general lack of groundwater contribute to the site soils' stability. Adherence to CBC and OSHPD 1 requirements would ensure the maximum practicable protection available for hospital and non-hospital structures on the SUMC Sites, as well as for their associated trenches, excavations, and foundations. Potentially unstable soils discovered during excavation are required by provisions of the City Building Code to be removed and replaced with engineered fill, or otherwise treated to provide appropriate foundation support and to protect them from failures such as liquefaction. The City and State Building Code standards would be required for all non-hospital structures. The hospital portion of the SUMC Project would be required to meet the strict safety standards established by OSHPD, including the seismic standards mandated in the HFSSA.

In view of the requirements to comply with the grading and foundation support requirements of the City and State Building Codes for the non-hospital portions of the SUMC Project, the requirements of the HFSSA for the hospital portion, and the design recommendations of the SUMC Project's geotechnical report to be included in the project design, the potential impacts associated with seismically induced ground failure (including liquefaction), would be less than significant.

Because the SUMC Sites are nearly level, there is no risk that seismically induced or static landslides would occur on the SUMC Sites. The risks associated with the potential collapse of the side walls of excavations for hospital and non-hospital buildings are regulated and addressed by the City and State Building Codes. Adherence to the applicable requirements of the 2007 CBC would ensure the maximum practicable stability of trenches and excavations for hospital and non-hospital structures on the SUMC Sites and would ensure impacts associated with slope instability would be less than significant.

Expansive materials occur in the subsoils throughout the SUMC Sites. The existence of expansive subsoils makes it necessary to ensure the materials used for foundation support are sound to avoid future problems of settlement and utility line disruption. An acceptable degree of soil stability can be achieved by treatment programs to eliminate expansion of soils that could include, but would not be limited to, lime grouting, wet recompaction, and excavation for replacement with non-expansive material, as described previously, to address the specific soil conditions at the construction sites. Adherence to the foundation support requirements of the 2007 CBC, including the OSHPD 1 requirements, where applicable, would ensure the maximum practicable stability of the soils supporting the foundations of hospital and non-hospital structures on the SUMC Sites such that the potential for damage from expansive soils would be less than significant.

Operation. The application of the CBC to the non-hospital structures at the SUMC Sites and of the heightened requirements of OSHPD 1, including the seismic standards mandated by the HFSSA, to hospital buildings during the design and construction phases of the SUMC Project would ensure that the operational phase would have less-than-significant impacts related to seismic vibration and ground failures. This does not mean that the structures and grounds would not sustain damage during a major earthquake, but that non-hospital structures would not be expected to collapse and that hospital buildings would remain operational following such a seismic event.

Consequently, the use of standard engineering design and seismic safety techniques, as required by existing regulations, would ensure that the SUMC Project would have a less-than-significant potential to expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic groundshaking, seismic-related ground failure (including liquefaction), landslides, expansive soil, or major geologic hazards.

GS-2. Exposure to Other Geotechnical Hazards. The SUMC Project would have a less-than-significant potential to be located on geologic units or on soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. (LTS)

Design. The SUMC Sites are nearly level, as is the land on all sides of them. Consequently, on- or off-site landsliding would not be a natural hazard. Slope stability issues related to the sides of excavations are regulated by the 2007 CBC through the City Building Code for non-hospital structures and the OSHPD 1 requirements of the State Building Code for hospital structures. Adherence to the applicable requirements of the 2007 CBC, including the OSHPD 1 requirements, where applicable, would ensure the maximum practicable stability of trenches and excavations for hospital and non-hospital structures on the SUMC Sites such that the potential for slope instability would be less than significant.

Construction. The SUMC Sites are surrounded on all sides by relatively flat topography. The closest free face, i.e., steep embankment, is the channel wall of San Francisquito Creek, 0.25 miles north of the Main SUMC Site. This distance is too great for lateral spreading to be a concern at the SUMC Sites because the intervening soil and geological materials form a buttress that would prevent the lateral movement of soil during liquefaction or lurching caused by an earthquake. Additionally, the soils and/or geologic materials supporting the foundations of structures at the SUMC Sites would be required by the City Building Code (for non-hospital structures) and the OSHPD 1 requirements of the State Building Code (for hospital structures) to be engineered to prevent liquefaction and to resist the lateral forces imposed by earthquakes (see Impact GS-1). Adherence to the requirements of the 2007 CBC, including the OSHPD 1 requirements, where applicable, would ensure the maximum practicable stability of the SUMC Sites such that the potential for lateral spreading and liquefaction would be less than significant.

The material strength of the soils or geologic units at the SUMC Sites were found to be moderate to high by previous geotechnical investigations because of their naturally high compaction and relatively high proportions of sand and gravel, which provide more resistance than loose sandy or clayey soils. As a consequence, their potential for soil collapse is low. In the event subsequent geotechnical investigations for project foundation design reveal any weak soils, an acceptable degree of material strength could be achieved by recompaction or excavation for replacement with non-compressible materials. The City's Building Code requires that any correction of weak soil conditions be part of the grading design for non-hospital structures. Similarly, the OSHPD 1 requirements of the State Building Code apply to the design and construction of hospital structures. Adherence to the requirements of the 2007 CBC, including the OSHPD 1 requirements, where applicable, would ensure the maximum practicable stability of the SUMC Sites such that the potential for soil collapse would be less than significant.

As described in Section 3.11, Hydrology, groundwater encountered at the Main SUMC Site is over 50 feet bgs. The historical groundwater level at the Main SUMC Site is below 30 feet bgs.[43] The historical depth to groundwater of at least 30 feet bgs at the Hoover Pavilion was confirmed by investigations in 1995, 2000, and 2007.[44] Thus, based on field evaluations and historic data, the design groundwater depth is recommended to be 30 feet bgs[45] because groundwater levels can fluctuate with the seasons as greater or lesser amounts of rain falls. During construction, dewatering may be necessary for the four-level deep underground parking structures (which could extend to about 45 feet bgs), the underground portion of the parking structure at the Hoover Pavilion Site (about 25 feet bgs), some of the deeper building foundations (any foundations deeper than 5 feet bgs), and some of the trenches and pits (possibly 10 to 15 feet below the lowest occupied levels of the buildings), because of slow permeability soils.[46] Construction dewatering temporarily lowers the water level in the unconfined surface aquifer to ensure safe working conditions in the project excavations, as required by the State and City Codes. Because the water level in this aquifer fluctuates frequently under natural conditions, there is very little possibility that the soils or geologic materials forming the aquifer would react any differently (i.e., would subside) during the artificial lowering caused by construction dewatering. Adherence to the excavation and dewatering requirements of the CBC would ensure the maximum practicable stability of the SUMC Sites such that the potential for subsidence would be less than significant.

Operation. Because the underground parking structures would extend about four levels below grade to approximately 45 feet bgs (some of the foundations could be even deeper), there is a possibility that they could be subject to damage from seasonally fluctuating groundwater. The design water table depth at the SUMC Sites is recommended to be 30 feet bgs, but the water table is not a static surface; it can rise or fall as groundwater conditions respond to seasonal differences in rainfall locally or in the upper portions of the San Francisquito Creek watershed. Consequently, it is probable that the foundations and portions of the exterior walls of the underground parking structures would be below the water table at some time. Foundation drains were not recommended for structures proposed at the Main SUMC Site or the Hoover Pavilion Site and permanent active dewatering is not permitted in the City of Palo Alto, so the

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43 Rutherford and Chekene Consulting Engineers, *Geotechnical Investigation Final Report, Stanford Hospital & Clinics,* December 24, 2008, p. 11.

44 Geomatrix, *Phase I Environmental Assessment: Hoover Pavilion 211 and 215 Quarry Road Palo Alto, California*, September 2007, p. 3.

45 Rutherford and Chekene Consulting Engineers, *Geotechnical Investigation Final Report, Stanford Hospital & Clinics,* December 24, 2008, p. 12.

46 Stanford Land Use & Environmental Planning, *SUMC Design & Construction*, Figure 4-7 SUMC Building Height Comparison, revised April, 2008. Each subsurface level is proposed to be 10 feet 2 inches deep. An additional four to five feet would be needed for foundation and equipment pit construction.

potential for long-term subsidence from dewatering would not occur. Flood proofing of the underground levels would be necessary, as required by the City's Building Code. Adherence to the flood proofing requirements of the CBC would ensure the maximum practicable stability of the SUMC Sites such that the potential for subsidence would be less than significant.

GS-3. Cause Substantial Erosion or Siltation. The SUMC Project would have a less-than-significant potential to cause substantial erosion or siltation. (LTS)

Construction. The SUMC Project would include construction activities such as demolition of structures and surface parking; excavation and trenching for foundations, underground garages, and utilities; soil compaction and site grading; and the erection of new structures, all of which would temporarily disturb soils. The exposure of previously covered soils during these activities could lead to increased on-site erosion and off-site sediment transport because disturbed soils are susceptible to higher rates of erosion from wind, rain, and runoff of dewatering discharge or dust control water than undisturbed soils. The State Water Resources Control Board, the City's Municipal Code (Chapter 16.11 *Stormwater Pollution Prevention*), and the City's Urban Runoff Management Plan require erosion and sediment controls for construction projects with more than 1 acre of land disturbance. The City's Municipal Code Chapter 16.28, *Excavations, Grading and Fills* includes Section 16.28.120, *Interim Erosion and Sediment Control and Storm Water Pollution Prevention Plan*, which implements the requirements of CBC Appendix Section J110, *Erosion Control*, for construction periods, thus addressing the issue of soil loss. The SUMC Project would require a Grading and Excavation Permit: Interim and Final Grading Plans must be prepared by a licensed professional. These requirements include preparation and implementation of a Storm Water Pollution Prevention Plan, with both construction-period and permanent erosion and sediment controls; preparation and implementation of an erosion and sediment control plan, describing both construction-period and permanent erosion and sediment controls; and construction site inspection by the City of Palo Alto. The SUMC Project would be required to comply with these existing regulations. Adherence to these requirements would prevent substantial on-site erosion such that impacts would be less than significant from the perspective of soil loss at the construction site.

Operation. Surface runoff from the SUMC Sites during operation of the SUMC Project would continue to be collected in a local stormwater drain system and the City's stormwater drain system that discharges to San Francisquito Creek. Additionally, permanent erosion and sediment control Best Management Practices (BMPs) are required by the City's Municipal Code, the City's Urban Runoff Management Plan, and the State Water Resources Control Board, which would protect pervious surfaces from erosion and minimize sediment transport (see Impact HW-4, Stormwater Runoff and Erosion, in Section 3.11, Hydrology). Adherence to these requirements would prevent substantial erosion and sedimentation such that impacts would be less than significant.

Cumulative Analysis

The geographic context for the analysis of impacts resulting from geologic hazards generally is site-specific, rather than cumulative in nature, because each development site has different set of geologic and soil characteristics that would be subject to uniform site development policies and construction standards imposed by the City of Palo Alto or OSHPD. Soil and geologic conditions are site-specific and there is little, if any, cumulative relationship between the SUMC Sites and other areas in the City. As such, the potential for cumulative impacts to occur is geographically limited for many geology and soils impact analyses.

In common with the rest of California, the SUMC campus is in a seismically active area and is subject to risk of damage to persons and property as a result of seismic groundshaking. Given the risk from seismic activity associated with all development in seismically active areas, this impact would be significant if it were not regulated by building code requirements. Building in California is strictly regulated by the CBC, as adopted and enforced by each jurisdiction, to reduce risks from seismic events to the maximum extent possible. Because the City of Palo Alto and OSHPD use and enforce the requirements of the CBC, new buildings and facilities are required to be sited and designed in accordance with the most current geotechnical and seismic guidelines and recommendations. With adherence to the CBC and related plans, regulations, and design and engineering guidelines and practices, the SUMC Project would not make a cumulatively considerable contribution to any potential cumulative impact arising from groundshaking. The SUMC Project's cumulative impact in this regard would be less than significant.

GS-4. Cumulative Exposure to Substantial Erosion or Siltation. The SUMC Project, in combination with other foreseeable development in the San Francisquito Creek Watershed, would not substantially increase erosion or siltation because of State, federal, and local runoff and erosion prevention requirements. As a result, the cumulative impact would be less than significant. (LTS)

As presented in Impacts GS-3, above, and HW-4 and HW-12 (Section 3.11, Hydrology), potential impacts from erosion and the loss of topsoil caused by site development and operation can be cumulative in effect within a watershed. The 42-square-mile San Francisquito Creek Watershed forms the geographic context of cumulative erosion impacts. Anticipated cumulative growth in this geographic area would occur with build-out of the Palo Alto, Menlo Park, and Woodside General Plans, as well as development at the nearby SLAC National Linear Accelerator Laboratory in San Mateo County. Such development is subject to federal, State, and local runoff and erosion prevention requirements, including the applicable provisions of the general construction permit, BMPs, and Phases I and II of the NPDES permitting process, as well as implementation of fugitive dust control measures of BAAQMD Rule 403 (prevention of particulate fallout and over-sprinkling runoff). The regulations include construction phase and permanent erosion and sediment controls to prevent development-site erosion and sediment transport to the creek. All of the jurisdictions in the watershed regulate potential erosion- and sedimentation-causing activities through their municipal codes. The stormwater ordinances adopted by all the stakeholders ensure legal authority to control erosion and sediment transport. The City's Municipal Code (Chapters 16.11 and 16.28), and the City's Urban Runoff Management Plan require erosion and sediment controls for construction projects with more than 1 acre of land disturbance. Applicable control measures are implemented as conditions of approval of all subject project development and are a focus of continuing enforcement. Consequently, cumulative stormwater runoff and erosion impacts would be less than significant. Because cumulative impacts would be less than significant, it is not necessary to evaluate the contributions of the SUMC Project to the cumulative effect.

Glossary

Alquist-Priolo Earthquake Fault Zone: In 1972 the State of California began delineating special studies zones (called Earthquake Fault Zones since January 1994) around active and potentially active faults in the State. The zones are revised periodically, and extend 200 to 500 feet on either side of identified fault traces. No structures for human occupancy may be built across an identified active fault trace. An area of 50 feet on either side of an active fault trace is assumed to be underlain by the fault, unless proven otherwise. Proposed construction in the Earthquake Fault Zone is permitted only following the completion of a fault location report prepared by a California-registered professional Geologist.

Characteristic Earthquake: Characteristic earthquakes are repeat earthquakes that have the same faulting mechanism, magnitude, rupture length, location, and, in some cases, the same epicenter and direction of rupture propagation as earlier shocks. As used in this report, the moment magnitude (M_W) of the "characteristic earthquake" indicates the scale of the seismic event considered representative of a particular fault segment, based on seismologic observations and statistical analysis of the probability that a larger earthquake would not be generated during a given time frame (often 50 or 100 years). In the Bay Area, the characteristic earthquake for the Peninsula segment of the San Andreas fault has a moment magnitude (M_W) of 7.3; the Northern and Southern segments of the Hayward fault, a M_W of 6.9; and the Calaveras fault, M_W 6.2. The term "characteristic earthquake" replaces the term "maximum credible earthquake" as a more reliable descriptor of future fault activity (Working Group on California Earthquake Probabilities. 2003. *Earthquake Probabilities in the San Francisco Bay Region: 2002-2031*. USGS Open-File Report 2003-214.).

Ground Acceleration: The speed at which soil or rock materials are displaced by seismic waves. It is measured as a percentage of the acceleration of gravity (0.5g = 50 percent of 32 feet per second squared, expressed as a vertical or horizontal force). <u>Peak</u> ground acceleration is the maximum acceleration expected from the characteristic earthquake predicted to affect a given area. <u>Repeatable</u> acceleration refers to the acceleration resulting from multiple seismic shocks. <u>Sustained</u> acceleration refers to the acceleration produced by continuous seismic shaking from a single, long-duration event.

Modified Mercalli Intensity (MMI) Scale: A 12-point scale of earthquake intensity based on local effects experienced by people, structures, and earth materials. Each succeeding step on the scale describes a progressively greater amount of damage at a given point of observation. Effects range from those that are detectable only by seismicity recording instruments (I) to total destruction (XII). Most people will feel Intensity IV ground motion indoors and Intensity V outside. Intensity VII frightens most people, and Intensity IX causes alarm approaching panic. The scale was developed in 1902 by Giuseppi Mercalli for European conditions, adapted in 1931 by American seismologists Harry Wood and Frank Neumann for conditions in North America, and modified in 1958 by Dr. Charles F. Richter to accommodate modern structural design features.

Moment Magnitude (M_W): A logarithmic scale introduced by Hiroo Kanamori in 1977 that is used by modern seismologists to measure the total amount of energy released by an earthquake. For the purposes of describing this energy release (i.e., the "size" of an earthquake on a particular fault segment for which seismic resistant construction must be designed) the moment magnitude (M_W) of the characteristic earthquake for that segment has replaced the concept of a maximum credible earthquake of a particular Richter magnitude. This has become necessary because the Richter scale "saturates" at the higher magnitudes; that is, the Richter scale has difficulty differentiating among the sizes of earthquakes above M 7.5. To correct for this effect, the formula used for the M_W scale incorporates parameters associated with the rock types at the seismic source and the area of the fault surface involved in the earthquake. Thus, the moment magnitude is related to the length and width of the fault rupture. It reflects the amount of "work" (in the sense of classical physics) done by the earthquake. The relationship between Richter and moment magnitudes is not linear (i.e., moment magnitude is not a set percentage of Richter magnitude): the two values are derived using different formulae. The four well-studied earthquakes listed below exemplify this relationship.

Location	Date	Richter Magnitude	Moment Magnitude
New Madrid MO	1812	8.7	8.1
San Francisco CA	1906	8.3	7.7
Anchorage AK	1964	8.4	9.2
Northridge CA	1994	6.4	6.7

Although some of the values shown on the M_W scale appear lower than those of the traditional Richter magnitudes, they convey more precise (and more useable) information to geologic and structural engineers.

Richter Magnitude Scale: The Richter Magnitude Scale is a logarithmic scale developed during 1935 and 1936 by Dr. Charles F. Richter and Dr. Beno Gutenberg to measure earthquake magnitude (M) by the amount of energy released, as opposed to earthquake intensity as determined by local effects on people, structures, and earth materials (as in the Modified Mercalli Intensity Scale). Each whole number on the Richter scale represents a 10-fold increase in amplitude of the waves recorded on a seismogram and about a 32-fold increase in the amount of energy released by the earthquake. Because the Richter scale tends to saturate above approximately M 7.5, it is being replaced in modern seismologic investigations by the moment magnitude (M_W) scale.

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3.11 HYDROLOGY

Introduction

This section describes the hydrology and water quality conditions present within and around the SUMC Sites including surface and groundwater resources. This section evaluates whether the SUMC Project could affect storm drainage and streams, as well as local groundwater resources in the area. Potential impacts expanded upon in this EIR section are groundwater and surface water quality degradation during construction and operation, flooding and drainage, and loss of groundwater recharge. The potential for mudslide hazards is addressed in Section 3.10, Geology, Soils, and Seismicity, as landslides and liquefaction impacts.

Information presented in this section was obtained through a review of topographical maps of the area and reports prepared by the California Department of Water Resources, the U.S. Geologic Survey, the Regional Water Quality Control Board (RWQCB), and the City of Palo Alto. Related plans and policies are explained, including the *City of Palo Alto Comprehensive Plan*, the *Santa Clara Valley Water District Groundwater Management Plan*, the *Santa Clara Valley Urban Runoff Pollution Prevention Program*, and the *Santa Clara Valley Urban Runoff Program Urban Runoff Management Plan*. Potential hydrology and water quality impacts were determined by assessing the SUMC Project's land use change impacts on drainage, groundwater conditions, and potential water quality concerns both during and following the construction period, based on specified impact significance criteria.

Issues identified in response letters to the NOP and during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project were considered in preparing this analysis. Applicable issues that were identified mostly pertain to the potential for impacts on San Francisquito Creek, which runs 0.25 mile north of the Main SUMC Site. These issues, including effects of operation and vehicle trips on roadway erosion, are addressed in this section.

Existing Conditions

Surrounding Areas

Climate. Climate in the areas surrounding the SUMC Sites is a Mediterranean-type climate characterized by wet but relatively mild winters and dry summers with variable summer temperatures, depending on the region. Mean annual precipitation in the vicinity is about 15.7 inches per year with 89 percent occurring during October through March. Mean annual temperature is 59.2 degrees Fahrenheit (°F) with the minimum mean monthly temperature occurring during December (48.7 °F) and the maximum mean monthly temperature occurring during July and August (68.0 °F).[1]

[1] Western Regional Climate Center, *Palo Alto, California NCDC 1971-2000 Monthly Normals*, http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6646, accessed October 8, 2007.

Ground Features. The topography, soils, subsurface materials, and geologic structure of the SUMC Sites and surrounding areas are addressed in Section 3.10, Geology, Soils, and Seismicity. The distribution and relationship of these features influence the location, form, and quality of surface water and groundwater. In turn, these features are shaped, to a greater or lesser extent, by standing and flowing water, whether on the ground surface or beneath it. Most soils in the urbanized portion of Palo Alto, for example, were eroded by flowing water from upland terrace slopes or bedrock ridges and deposited as river channel or pond sediments in the structural valley that forms San Francisco Bay (Bay).

Surface Water Drainage. Land development and modification of natural drainages have altered infiltration and runoff rates, changing the timing, distribution, and magnitude of surface water and groundwater flow. Urbanization has increased runoff by the development of impervious surfaces, surface soil compaction, grassland conversion, dewatering of upland stream valleys, and the degradation of natural riparian communities. Both the peak flow rate and volume of storm flows typically increase with intensified urbanization and the delivery of runoff to streams after the beginning of rainfall becomes flashier, thereby reducing the lag time between the rainfall and the peak of a stream's flood stage.[2] As development occurs in the Project's vicinity, storm drainage systems are extended to convey stormwater to San Francisco Bay. Stormwater flows from urbanized areas of the City of Palo Alto are routed through street gutters and open channels to drop inlets connected to underground conduits beneath roadways.

Increased imperviousness can greatly alter runoff from small, frequent flood events by up to a 10-fold increase in flow rate. However, increased imperviousness often has little effect on flows during extreme events (e.g., 100-year flood flow events) because during these events, rainfall saturates even natural soils, rendering them effectively impervious.[3]

Runoff from the area in which the SUMC Sites are located is collected in the local Stanford University storm drainage system or the City of Palo Alto storm drainage system, which both ultimately discharge to San Francisquito Creek (USGS HUC 18050003).[4] (Section 3.15, Utilities, provides more information on the stormwater drainage system that serves the SUMC Sites.) San Francisquito Creek discharges to the San Francisco Bay South area. The creek is on the north side of Sand Hill Road, and at its closest point is about 0.25 miles north of the Main SUMC Site.

2 Santa Clara Basin Watershed Management Initiative, Watershed Management Plan: *Volume I: Watershed Characteristics Report Unabridged 2003 Revision,* Chapter 4 Land Use in the Santa Clara Basin, Revised August 2003, p. 4-2, www.valleywater.org/_wmi/related_report/wcr2003r.cfm.

3 Santa Clara Basin Watershed Management Initiative, Watershed Management Plan: *Volume I: Watershed Characteristics Report Unabridged 2003 Revision,* Chapter 4 Land Use in the Santa Clara Basin, Revised August 2003, p. 4-10, www.valleywater.org/_wmi/related_report/wcr2003r.cfm. San Francisquito Creek Coordinated Resource Management and Planning Flood and Erosion Control Task Force, *Reconnaissance Investigation Report of San Francisquito Creek,* December 1997, p. 17.

4 USGS HUC refers to the US Geological Survey Hydrologic Unit Code.

San Francisquito Creek drains a watershed of about 42 square miles in the Santa Clara Valley Hydrologic Planning Area. The watershed encompasses the area from Skyline Boulevard at the top of the Santa Cruz Mountains to the San Francisco Bay, and includes lands in the cities of East Palo Alto, Menlo Park, Palo Alto, Portola Valley, and Woodside, unincorporated land areas of San Mateo and Santa Clara counties, and Stanford University.[5] Historically, the sediment carried in high stream flows from the upland area was deposited as the stream flow slowed down in the flatter lowland areas, forming the San Francisquito Creek alluvial fan. Mean monthly stream flow (30-year average) measured in San Francisquito Creek at the USGS Gage 11164500 at Stanford University, upstream from the SUMC Sites, is listed in Table 3.11-1.[6]

Table 3.11-1
Mean Monthly Flow at the USGS Gage:
San Francisquito Creek at Stanford University

Month	Flow (cfs)
January	61.0
February	77.9
March	54.2
April	26.4
May	4.14
June	1.28
July	0.52
August	0.28
September	0.32
October	0.93
November	5.58
December	27.1

Source: USGS, 2007.

Peak streamflow for each year from 1977 through 2006 ranged from 82 cubic feet per second (cfs) in March of 1977 to 7,200 cfs in February of 1998.[7]

5 California Coastal Commission, Critical Coastal Areas (CCA) Program, *State of the CCAs Report* (CCA #93 San Francisquito Creek), June 15, 2006, p. 1, http://www.coastal.ca.gov/nps/Web/cca_pdf/sfbaypdf/CCA93SanFrancisquitoCreek.pdf, accessed October 9, 2007.

6 US Geological Survey, *USGS Surface-Water Monthly Statistics for the Nation,* USGS 11164500 San Francisquito C A Stanford University CA, Monthly Mean in cfs (Calculation Period 1977-09-01->2006-09-30), Period-of-Record for Statistical Calculation Restricted by User, http://waterdata.usgs.gov/nwis/monthly/, accessed October 8, 2007.

7 US Geological Survey, *Peak Streamflow for the Nation,* USGS 11164500 San Francisquito CA Stanford University CA, 1931 through 2006, http://nwis.waterdata.usgs.gov/nwis/, accessed October 8, 2007.

Although San Francisquito Creek flows through an urban environment for most of its lower length, overall, about half of the total creek length remains in a near natural state.[8] The reach of San Francisquito Creek near the SUMC Sites is an unaltered natural channel.[9]

Stream flow in San Francisquito Creek is variable because of its dependence on rainfall.[10] Most of the reaches in the lower watershed on the San Francisquito alluvial fan are dry about six months out of the year. San Francisquito Creek is generally a "losing stream." In other words, flow through San Francisquito Creek infiltrates to groundwater. A USGS study measured that, overall, flow loss from San Francisquito Creek contributes about 951 acre-feet of groundwater recharge per year.[11] The reach of the San Francisquito Creek to which the SUMC Sites discharge contributes about 322 acre-feet of groundwater recharge per year. During high flow conditions (where flow is more than 19 cfs at the San Mateo Drive bicycle bridge[12]), about 14 percent of flow was lost from San Francisquito Creek between the San Mateo Drive bicycle bridge and Alma Street. During low flow conditions (less than 1 cfs at the bicycle bridge), all flow was lost; and, during moderate flow conditions (1 to 6 cfs at the bicycle bridge), 36 to 95 percent of its flow was lost. Furthermore, isotopic and other chemical data indicate that urban runoff from residential irrigation or other domestic uses of imported water constitutes most of the streamflow in San Francisquito Creek during low-flow conditions.[13]

Flood Hazards. The San Francisquito Creek is the dividing line between two counties: San Mateo and Santa Clara. The Santa Clara Valley Water District (SCVWD) has jurisdiction over most of the major streams and flood control facilities throughout the Palo Alto area, and has initiated ongoing drainage-way improvements, including San Francisquito Creek. The SCVWD is responsible for flood protection in Santa Clara County. The SCVWD has prepared a Stream Maintenance Plan (SMP) to perform routine activities undertaken in streams and canals and on adjacent SCVWD property and

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8 Loren Metzger, *Streamflow Gains and Losses Along San Francisquito Creek and Characterization of Surface Water and Ground-Water Quality, Southern San Mateo and Northern Santa Clara Counties, California, 1997-1997.* U.S. Geological Survey Water Resources Investigations Report 01-4078, 2002. p. 5.

9 Santa Clara Basin Watershed Management Initiative Report Preparation Team, *Volume II. Watershed Assessment Report,* Chapter 5 Assessment of San Francisquito Watershed, Appendix 5-B: San Francisquito Creek Sand Hill Road to Los Trancos Creek Confluence, February 2003, p. 16, http://www.valleywater.org/_wmi/participates_login/aseessment/index.cfm Chapter 5 Reach Assessment Table SF.pdf, accessed November 29, 2007.

10 Loren Metzger, *Streamflow Gains and Losses Along San Francisquito Creek and Characterization of Surface-Water and Ground-Water Quality, Southern San Mateo and Northern Santa Clara Counties, California, 1997-1997.* US Geological Survey Water Resources Investigations Report 02-4078, 2002. p. 5.

11 Loren Metzger, *Streamflow Gains and Losses Along San Francisquito Creek and Characterization of Surface-Water and Ground-Water Quality, Southern San Mateo and Northern Santa Clara Counties, California, 1997-1997.* US Geological Survey Water Resources Investigations Report 02-4078, 2002, p. 23.

12 The San Mateo Drive bicycle bridge is located in the City of Menlo Park, north of San Francisquito Creek. The bridge terminates just north of San Francisquito Creek, near Vineyard Road on the south side of the creek within the City of Palo Alto.

13 Loren Metzger, *Streamflow Gains and Losses Along San Francisquito Creek and Characterization of Surface-Water and Ground-Water Quality, Southern San Mateo and Northern Santa Clara Counties, California, 1997-1997.* US Geological Survey Water Resources Investigations Report 02-4078, 2002. pp. 15-19, 36.

easements.[14] The SCVWD's principal maintenance activities are: 1) sediment removal from creeks and associated facilities such as sediment basins, fish ladders, and stream gage stations, and from water supply canals; 2) vegetation management along and adjacent to creeks and canals; and 3) bank protection on creeks. The SCVWD reviews drainage plans and general designs of specific land development proposals near streams and flood control channels under their jurisdiction for their hydraulic adequacy and prepares and implements capital improvement programs, such as levee restorations and improvements in San Francisquito Creek.

The San Francisquito Creek Joint Powers Authority (JPA) also has jurisdiction over San Francisquito Creek through the JPA agreement signed in May 1999 by the SCVWD and City of Palo Alto, which is a binding document for compliance to the JPA-stated goals and policies. Therefore, SCVWD does not have sole management of the San Francisquito Creek. Although the JPA is not a regulatory agency, it is responsible for coordinating activities for the San Francisquito Creek watershed within the member agencies' jurisdictions.

The City of Palo Alto and Stanford University are responsible for the maintenance of and improvements to the storm drainage system serving the SUMC Sites. The City and Stanford Utilities Division review development plans for their potential impacts on the municipal storm drain system.

The SCVWD's Design Standards specify that creeks and flood control channels should be designed or improved to contain the 100-year flood.[15] San Francisquito Creek in the vicinity of the SUMC Project is adequate to convey the 100-year flood, although downstream reaches of the creek do not meet this design standard.[16] The City of Palo Alto Engineering Design Standards for storm drain facilities requires that all new facilities be designed to convey the 10-year storm flow. Existing storm drain facilities in the vicinity of the SUMC project are adequate to convey the 10-year storm.[17] Creeks and flood control channels are designed to a higher standard than storm drains because they are regional drainage facilities that have the potential to inflict substantial property damage and personal injury or death over a widespread area, whereas storm drain overflows typically result in relatively minor localized flooding of streets and intersections.

Because of the watershed's topography, flooding has long been associated with San Francisquito Creek.[18] Rainfall occurs mainly during the winter. Portions of the watershed near the crest of the Santa Cruz Mountains receive 40 to 60 inches per year, while the central Santa Clara Valley receives

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[14] The SCVWD's jurisdiction on a stream begins at that point where 320 acres (0.5 square miles) of watershed drain to the stream, and continues downstream to San Francisco Bay or the limits of the Pajaro River in Santa Clara County.

[15] An event with a one percent chance of being equaled or exceeded in any given year.

[16] San Francisquito Creek Coordinated Resource Management and Planning Flood and Erosion Control Task Force. *Reconnaissance Investigation Report of San Francisquito Creek.* San Francisquito Creek Coordinated Resource Management and Planning. December, 1997. p. 14.

[17] Catherine Palter, Associate Director, Land Use and Environmental Planning, Stanford University, electronic communication with PBS&J, March 13 2008.

[18] Santa Clara Basin Watershed Management Initiative Report Preparation Team, *Volume II. Watershed Assessment Report,* Chapter 5 Assessment of San Francisquito Watershed, February 2003, pp. 5-1 to 5-4, http://www.valleywater.org/_wmi/_PDFs/Assessmentreport/FINAL%20Chapters/Chapter%205%20Final.doc.

an average between 13 and 14 inches. The steep slopes of the mountains swiftly convey the water in tributaries to the Bay plain where the waters historically spread out across a much larger floodplain. Most of this floodplain has been converted to urban and residential development and the creek channel itself has been modified in some areas to provide flood protection. Nonetheless, major flood incidents have occurred in the past, most recently in 1955, 1958, 1982, 1995, and 1998. After the floods of 1955 and 1958, interim flood protection measures were implemented on the creek in the reaches upstream and downstream of US 101. The creek flooded again in 1998, when streamflows exceeded the highest on record. The 1998 flood inundated areas of Menlo Park, Palo Alto, and East Palo Alto downstream of El Camino Real.

San Francisquito Creek is in the SCVWD Northwest Flood Control Zone and San Mateo County's San Francisquito Creek Flood Control Zone.[19] The upland portion of the watershed consists of low density residential development and bushy woodlands. The relatively flat valley floor has been extensively developed and is typical of most urban areas.[20] The primary flood problem is downstream of El Camino Real, and therefore, downstream of the SUMC Sites. Upstream of El Camino Real, to the west of the SUMC Sites, the channel has adequate capacity to convey the 100-year flood event.[21]

In an attempt to control flooding and bank erosion in portions of the lower channel, areas on both sides of the channel between the University Avenue Bridge and US 101 have been lined with sacked concrete and protected with berms or low floodwalls.[22] Additionally, there are intermittent areas of sacked concrete as far upstream as the Waverley Street bicycle bridge. The reach between US 101 and the Bay has been widened and leveed. However, the reach into which the area discharges is an unlined, unmodified, natural channel.[23]

The severity of flooding in San Francisquito Creek has increased because of sedimentation. Sedimentation occurs in the reach of the creek downstream of US 101 because of tidal action and deposition of sediment from upstream sources. Sediment that is transported from the headwaters of the creek is deposited when water slows down as the gradient of the stream changes in the flatter parts of the watershed. Once deposited, sediment occupies space in the channel that is no longer available to transport floodwaters. Sediment can interfere with local drainage outfalls by blocking pipes and

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19 A Flood Control Zone is an area within a Flood Control District to monitor and manage flooding and flood control activities.

20 San Francisquito Creek Coordinated Resource Management and Planning Flood and Erosion Control Task Force, *Reconnaissance Investigation Report of San Francisquito Creek,* December 1997, p. 2.

21 San Francisquito Creek Coordinated Resource Management and Planning Flood and Erosion Control Task Force, *Reconnaissance Investigation Report of San Francisquito Creek,* December 1997, p. 14.

22 Santa Clara Basin Watershed Management Initiative Report Preparation Team, *Volume II. Watershed Assessment Report,* Chapter 5 Assessment of San Francisquito Watershed, February 2003, p. 5-1 to 5-4, http://www.valleywater.org/_wmi/_PDFs/Assessmentreport/FINAL%20Chapters/Chapter %205%20Final.doc.

23 Santa Clara Basin Watershed Management Initiative Report Preparation Team, *Volume II. Watershed Assessment Report,* Chapter 5 Assessment of San Francisquito Watershed, Appendix B: San Francisquito Creek Sand Hill Road to Los Trancos Creek Confluence, February 2003, p. 16, http://www.valleywater.org/_wmi/_PDFs/Assessmentreport/FINAL%20Chapters/Chapter%205%20Final. doc.

culverts. Recent studies in the headwaters of San Francisquito Creek indicate that erosion rates, and therefore downstream sedimentation, are currently quite high.[24]

The SUMC Sites are not in a FEMA-defined 100-year flood zone.[25] However, the SUMC Sites are located in an area designated by FEMA as “Zone X”, which is defined as an area that can experience a 500-year flood, can experience a 100-year flood with less than one foot depth of ponding or drainage area of less than one square mile, or is protected by levees from the 100-year flood event. A FEMA Zone X is considered a moderate- to low-risk area.

There are three small reservoirs in the San Francisquito Creek watershed that were built for water conservation and storage purposes. The first reservoir is Searsville Reservoir on Corte Madera Creek. The other two reservoirs are Felt Reservoir and Lagunita Reservoir, which are off-stream reservoirs fed by diversions from Los Trancos Creek and San Francisquito Creek, respectively. All three reservoirs are on Stanford University property.

The SUMC Sites are in a dam inundation zone from failure of the Searsville Dam. The Lagunita Reservoir is closer to the SUMC Sites (less than 1 mile away); however, the spread of water during a dam failure from Lagunita Reservoir or Felt Lake does not extend to the SUMC Sites.[26]

Searsville Reservoir. Searsville Reservoir is the major reservoir in the San Francisquito Creek watershed. Searsville Reservoir was built in 1892 as a water supply reservoir and is in Stanford University’s Jasper Ridge Biological Preserve. Searsville Reservoir does not provide protection from flooding because it does not have an outlet works and cannot be operated as a flood control facility. Storm water runoff can only drain out of the reservoir by flowing over the spillway at the crest of the dam. Since the reservoir level cannot be lowered, it does not provide any flood storage or attenuation once it is filled by seasonal rains. The existing capacity of the reservoir is continually shrinking

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24 Santa Clara Basin Watershed Management Initiative Report Preparation Team, *Volume II. Watershed Assessment Report,* Chapter 5 Assessment of San Francisquito Watershed, February 2003, pp. 5-1 to 5-4, http://www.valleywater.org/_wmi/_PDFs/Assessmentreport/FINAL%20Chapters/Chapter %205%20Final.doc.

25 Federal Emergency Management Agency, National Flood Insurance Program, *Flood Insurance Rate Map City of Palo Alto, Santa Clara County, Panel 4 of 10 Community Panel No. 060348 0004D,* Map revised September 6, 1989. No Letters of Map Change, indicating an amendment to the 1989 flood map, are recorded with FEMA from 1997 through 2007. FEMA Map Service Center, FEMA Issued Flood Maps, Palo Alto, City/Santa Clara County, http://msc.fema.gov/webapp/wcs/stores/servlet/Category Display?storeId=10001&catalogId=10001&langId=1&categoryId=12001&parent_category_rn=12001&type=CAT_MAPPANEL&stateId=13011&countyId=13288&communityId=338404&stateName=CALIFORNIA&countyName=SANTA+CLARA+COUNTY&communityName=PALO+ALTO%2CCTY%2FSANTA+CLARA+CO&dfirm_kit_id=&dfirmCatId=null&isCountySelected=&isCommSelected=&userType=G&urlUserType=G&sfc=0&cat_state=13011&cat_county=13288&cat_community=338404, accessed October 10, 2007.

26 Association of Bay Area Governments, *ABAG Geographic Information Systems: Earthquake Preparedness; Interactive ABAG (GIS) Maps Showing Dam Failure Inundation*; Hazard Maps, Dam Failure Inundation Areas, June 2004, http://gis.abag.ca.gov, accessed October, 7, 2007.

because of the sediment trapped behind the dam[27] and has an estimated 307 acre-feet of storage capacity left of an original capacity of 692 acre-feet.[28]

Searsville Dam is 68 feet high with a drainage area of 14.8 square miles.[29] The dam is owned and operated by Stanford University. Searsville Dam survived the 1906 and the 1989 earthquakes with only minor damage because of its design: the dam's individual concrete blocks interlock, which permits enough movement to dissipate seismic shock (The Crystal Springs and San Andreas dams are of similar construction). The Searsville Dam is inspected regularly by the State of California and Stanford University.[30]

Tsunamis are waves caused by earthquakes that disturb the ocean floor or by large submarine landslides. A seiche is an oscillation of a body of water in an enclosed or semi-enclosed basin such as the San Francisco Bay and lakes. The City of Palo Alto Local Hazard Mitigation Plan does not identify any potential seiche hazards and since Palo Alto is not on the coast the potential for tsunami damage is believed to be low.[31]

Surface Water Quality. Surface water quality in developed areas is affected by various point-source and nonpoint-source or diffuse-source pollutants. Point-source pollutants are those emitted at a specific point, such as a pipe, while diffuse/nonpoint-source pollutants are typically generated by surface runoff from unconfined sources, such as streets, paved areas, or landscaped areas. As a general rule, point-source pollutants are more easily monitored; thus, pollutant discharge standards (also referred to as Waste Discharge Requirements or WDRs) are more easily enforced, while nonpoint-source pollutants, such as those found in urban runoff, are more difficult to monitor and enforce. Even though nonpoint-source pollutants are difficult to monitor, they are important contributors to surface water quality, especially in developed areas.

Constituents of, and concentrations in, runoff water vary with surrounding land uses, topography, and amount of impervious cover, as well as intensity and frequency of irrigation or rainfall. Runoff in developed areas may typically contain oil, grease, and metals accumulated in streets, driveways, parking lots, and rooftops, as well as pesticides, herbicides, particulate matter, nutrients, animal waste, and other oxygen-demanding substances from landscaped areas and directly deposited on impervious

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27 Santa Clara Basin Watershed Management Initiative Report Preparation Team, *Volume II. Watershed Assessment Report,* Chapter 5 Assessment of San Francisquito Watershed, February 2003, p. 5-15, http://www.valleywater.org/_wmi/_PDFs/Assessmentreport/FINAL%20Chapters/Chapter%205%20Final.doc.

28 R. Meehan, San Francisquito Creek 1999, Chapter 2: Foothills, 1999, http://www.stanford.edu/~meehan/sts90q99/ch2.htm.

29 Santa Clara Basin Watershed Management Initiative Report Preparation Team, *Volume II. Watershed Assessment Report,* Chapter 5 Assessment of San Francisquito Watershed, February 2003, pp. 5-1 to 5-4, http://www.valleywater.org/_wmi/_PDFs/Assessmentreport/FINAL%20Chapters/Chapter%205%20Final.doc.

30 Stanford University, *Human Impact on Jasper Ridge Biological Preserve,* extracts from Chapters 14 and 15 of JRBP Bio 96 A/B Docent Training Class Handbook, 2005 edition, http://trees.stanford.edu/JRPB.htm, accessed October 11, 2007.

31 City of Palo Alto. *ABAG Multi-Jurisdictional Local Hazard Mitigation Plan for the Bay Area,* Attachment B LHMP Annex City of Palo Alto, approved December 12, 2005, p. 4, http://quake.abag.ca.gov/mitigation/PaloAlto-Annex.pdf

surfaces. Concentrations of pollutants in runoff generated during the dry season by landscape irrigation and street washing (dry-weather runoff) are typically lower than concentrations found in wet-weather runoff (runoff generated by precipitation during the wet season). However, dry weather runoff can still contribute substantially to water quality impairment.

The highest pollutant concentrations in stormwater runoff are usually generated at the beginning of the wet season, during the so-called "first-flush." Approximately 80 percent of total accumulated pollutants are removed by the first 0.5 inch of rainfall when the percent of impervious surfaces is 70 to 90 percent, with street surfaces as the primary source of pollutants in urban areas.[32]

Santa Clara Valley streams do not receive discharges from industries or municipal wastewater.[33] Industrial discharges are routed to municipal sanitary sewers and then to regional municipal wastewater treatment plants that discharge to tidal sloughs of the San Francisco Bay.[34] In general, average pollutant concentrations in runoff do not vary significantly from one place to another within an urbanized watershed.[35] Pollutant concentrations do increase when impervious cover is more than 40 to 50 percent of the drainage area; however, runoff volume is the single most important variable for predicting pollutant loads.[36]

Surface water quality is monitored by the San Francisco Bay Regional Water Quality Control Board, Region 2 (RWQCB), under the Porter-Cologne Water Quality Control Act. The RWQCB implements a Water Quality Control Plan (Basin Plan) and portions of the federal Clean Water Act (CWA) to monitor and protect water quality in the San Francisco Bay Area to achieve the maximum beneficial use possible. Once beneficial uses have been officially designated, appropriate water quality objectives can be established and programs that maintain or enhance water quality can be implemented to ensure the protection of beneficial uses. Designated beneficial uses, together with water quality objectives (referred to as water quality criteria in federal regulations), form the relevant water quality standards. Such standards are mandated for all water bodies in the State under the California Water Code. The Water Code defines water quality objectives as "the allowable limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area."

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32 T. R. Schueler, *First Flush of Stormwater Pollutants Investigated in Texas,* Article 9, In the Practice of Watershed Protection. Center for Watershed Protection, 2000.

33 Santa Clara Basin Watershed Management Initiative, Watershed Management Plan: *Volume I Watershed Characteristics Report Unabridged 2003 Revision,* Chapter 4 Land Use in the Santa Clara Basin, revised August 2003, p. 4-13, www.valleywater.org/_wmi/related_report/wcr2003r.cfm.

34 Santa Clara Basin Watershed Management Initiative, Watershed Management Plan: *Volume I Watershed Characteristics Report Unabridged 2003 Revision,* Chapter 4 Land Use in the Santa Clara Basin, revised August 2003, p. 4-13, www.valleywater.org/_wmi/related_report/wcr2003r.cfm.

35 Santa Clara Basin Watershed Management Initiative, Watershed Management Plan: *Volume I Watershed Characteristics Report Unabridged 2003 Revision,* Chapter 4 Land Use in the Santa Clara Basin, revised August 2003, p. 4-13, www.valleywater.org/_wmi/related_report/wcr2003r.cfm.

36 Santa Clara Basin Watershed Management Initiative, Watershed Management Plan: *Volume I Watershed Characteristics Report Unabridged 2003 Revision,* Chapter 4 Land Use in the Santa Clara Basin, revised August 2003, p. 4-13, www.valleywater.org/_wmi/related_report/wcr2003r.cfm.

Where multiple uses exist, water quality standards must protect the most sensitive use. Water quality standards are typically numeric, although narrative criteria based upon biomonitoring methods may be employed where numerical standards cannot be established, or where they are needed to supplement numerical standards. Section 303(c)(2)(b) of the CWA requires states to adopt numerical water quality standards for toxic pollutants for which the Environmental Protection Agency (EPA) has published water quality criteria and which reasonably could be expected to interfere with designated uses in a water body (further details on the CWA and other regulations are explained under Applicable Plans and Regulations, below).

In addition to the establishment of water quality objectives, another approach for water quality improvement is a watershed-based approach that focuses on all water pollution sources and not just those traced to specific, discrete sources. If a body of water does not achieve the established water quality standards under traditional point source controls, it is listed as an impaired water body under Section 303(d) of the CWA. For 303(d) listed water bodies, a pollutant watershed budget is established, which defines the maximum amount of pollutants (or Total Maximum Daily Loads [TMDLs]) that can be received by the water body. If the sum of allowable pollutants from both point and non-point sources exceeds this maximum amount, a TMDL implementation (or clean-up) plan is required.

South San Francisco Bay. The South San Francisco Bay is listed as impaired by chlordane, DDT, dieldrin, and dioxin compounds from nonpoint sources; exotic species from ballast water; furan compound from atmospheric sources; mercury from industrial point sources, municipal point sources, resource extraction, atmospheric deposition, natural sources, and nonpoint sources; PCBs (polychlorinated biphenyls) and dioxin-like PCBs from unknown nonpoint sources; and selenium from agriculture and domestic use of groundwater.[37]

San Francisquito Creek. San Francisquito Creek is currently listed as impaired by diazinon from urban runoff/storm sewers and sedimentation/siltation from nonpoint sources.[38] Surface water quality measurements conducted by the U.S. Geological Survey in 1996 and 1997 indicated that total dissolved solids (TDS) concentrations in San Francisquito Creek in reaches upstream of the SUMC Sites had higher levels than downstream sites, even though flows were higher and would be expected to dilute the TDS concentrations. Phosphorous at the location just downstream from the SUMC Sites was higher than either the upstream or further downstream locations, while nitrogen was the lowest just downstream from the SUMC Sites. The higher TDS, along with other water chemistry data, indicate

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[37] San Francisco Bay Regional Water Quality Control Board, *Proposed 2006 CWA Section 303(d) List of Water Quality Limited Segments, San Francisco Bay Region,* U.S. EPA Approved June 27, 2007, p. 24-25, http://www.waterboards.ca.gov/tmdl/docs/303dlists2006/final/r2_final303dlist.pdf, accessed October 9, 2007.

[38] San Francisco Bay Regional Water Quality Control Board, *Proposed 2006 CWA Section 303(d) List of Water Quality Limited Segments, San Francisco Bay Region,* U.S. EPA Approved June 27, 2007, p. 24-25, http://www.waterboards.ca.gov/tmdl/docs/303dlists2006/final/r2_final303dlist.pdf, accessed October 9, 2007.

that urban runoff from irrigation, other uses, or imported water constitutes most of the streamflow in the lower reaches of San Francisquito Creek during low-flow conditions.[39]

Water quality monitoring in San Francisquito Creek upstream from the SUMC Sites has been conducted for Stanford University since 2002. Table 3.11-2 lists the annual flow and sediment load in San Francisquito Creek at Piers Lane.[40] Table 3.11-3 lists the period of record (water year 2003 through 2007) minimum and maximum concentrations measured in San Francisquito Creek at Piers Lane.[41]

Sedimentation is a problem in the reaches of San Francisquito Creek downstream of US 101.[42] This reach is subject to sedimentation from tidal action, as well as deposition of sediment from upstream sources. Sediment is transported by the faster flowing upstream water, which is deposited at the change of grade at US 101 and further downstream as water slows along the lower gradient. In 1996, sediment blocked at least one-third of the flow area beneath the US 101 crossing.[43] This sediment build-up causes a higher water surface for any given flow since it reduces the depth of the channel, which consequently reduces the drainage efficiency of the channel upstream. In the San Francisquito Creek watershed, extremely high natural sediment rates plus erosion associated with human activities are constraints for steelhead spawning and rearing.[44]

Alteration in stream channel morphology is considered another surface water quality feature because it can contribute to stream bed and bank erosion and loss of riparian and aquatic habitat. Pertinent major contributors to potential stream channel degradation in the Santa Clara Valley include: destabilization of streambeds and banks caused by imperviousness, increased drainage density, and changes to sediment inputs; agricultural and urban encroachment on riparian corridors; and disconnection of

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39 Loren Metzger, *Streamflow Gains and Losses Along San Francisquito Creek and Characterization of Surface-Water and Ground-Water Quality, Southern San Mateo and Northern Santa Clara Counties, California, 1997-1997,* US Geological Survey Water Resources Investigations Report 02-4078, 2002, pp. 19, 31, 40.

40 Balance Hydrologics, Inc., *Water Quality and Streamflow Monitoring of San Francisquito and Los Trancos Creeks at Piers Lane, and Bear Creek at Sand Hill Road, Water Year 2003, 2004, 3005, 2006, 2007, 2008, Long-term Monitoring and Assessment Program San Mateo and Santa Clara Counties, California*, Form 6. Annual Sediment Discharge Record, San Franciquito Creek at Piers Lane and Form 3. Annual Hydrologic Record, prepared for Stanford University, Utilities Division Jasper Ridge Biological Preserve, 2003 -2008, http://lbre.stanford.edu/sem/sf_creek_reports.

41 Balance Hydrologics, Inc., *Water Quality and Streamflow Monitoring of San Francisquito and Los Trancos Creeks at Piers Lane, and Bear Creek at Sand Hill Road, Water Year 2007, Long-term Monitoring and Assessment Program San Mateo and Santa Clara Counties, California*, Table 6 Summary of Water Quality at San Francisquito Creek and Los Trancos Creek at Piers Land, water year 2007, prepared for Stanford University, Utilities Division Jasper Ridge Biological Preserve, August 2008, http://lbre.stanford.edu/sem/sf_creek_reports.

42 San Francisquito Creek Coordinated Resource Management and Planning Flood and Erosion Control Task Force, *Reconnaissance Investigation Report of San Francisquito Creek,* December 1997, p. 22.

43 San Francisquito Creek Coordinated Resource Management and Planning Flood and Erosion Control Task Force, *Reconnaissance Investigation Report of San Francisquito Creek,* December 1997, p. 22.

44 Santa Clara Basin Watershed Management Initiative, Watershed Management Plan: *Volume I Watershed Characteristics Report Unabridged 2003 Revision,* Chapter 7 Natural Setting, Revised August 2003, p. 7-100, www.valleywater.org/_wmi/related_report/wcr2003r.cfm.

Table 3.11-2
Sediment Load In San Francisquito Creek Upstream From the SUMC Sites

Water Year	Sediment Load (tons)	Flow (acre-feet)
2003	1,741	1,934
2004	6,910	8,002
2005	9,463	17.627
2006	34,217	29,027
2007	674	3,533
2008	7,223	7.574

Source: Balance Hydrologics, 2003-2008.

Table 3.11-3
Period of Record Water Quality

		Concentration	
Constituent	**Units**	**Minimum**	**Maximum**
Ammonia-N	mg/L	ND	1.2
Nitrate-N	mg/L	0.31	5.5
Nitrate+Nitrite-N	mg/L	0.38	3.3
Phosphate-P	mg/L	0.09	3.98
Chlorpyrifos	mg/L	ND	ND
Diazinon	mg/L	ND	ND
Total Suspended Solids	mg/L	2	377
Hardness	mg/L	101	643
Total Aluminum	μg/L	ND	12,000
Dissolved Aluminum	μg/L	ND	190
Total Copper	μg/L	1.5	74.0
Dissolved Copper	μg/L	1.3	17.0
Total Lead	μg/L	ND	17.0
Dissolved Lead	μg/L	ND	1.10
Total Mercury	μg/L	0.0009	0.13
Dissolved Mercury	μg/L	ND	0.042
Total Nickel	μg/L	3.4	38.0
Dissolved Nickel	μg/L	2.6	9.0
Total Selenium	μg/L	0.2	1.3
Dissolved Selenium	μg/L	0.1	0.4
Total Silver	μg/L	ND	ND
Dissolved Silver	μg/L	ND	0.3
Total Zinc	μg/L	ND	110
Dissolved Zinc	μg/L	ND	47

Source: Balance Hydrologic's 2007.

streams from floodplains, caused by erosive downcutting of streambeds and by construction of channels and levees.[45]

Imperviousness associated with urban development magnifies the peak flow and total runoff during the 1.5- to 2-year flood event,[46] the size of flood event that most strongly influences stream characteristics.[47]

Groundwater. The SUMC Sites lie over the Santa Clara Valley Groundwater Basin, Santa Clara Subbasin (Subbasin). The Subbasin occupies a structural trough parallel to the northwest trending Coast Ranges.[48] The Diablo Range bounds the basin on the east and the Santa Cruz Mountains form the basin boundary on the west. These mountain ranges nearly converge at the Coyote Narrows, which forms the southern boundary of the Subbasin.[49] It extends from the northern border of Santa Clara County to the groundwater divide near the town of Morgan Hill. The dominant geohydrologic feature is a large inland valley. The valley is drained to the north by tributaries to San Francisco Bay including Coyote Creek, the Guadalupe River, and Los Gatos Creek. Annual precipitation for the Subbasin ranges from less than 16 inches in the Santa Clara Valley to more than 28 inches in the upland areas.

The Subbasin is about 22 miles long and 15 miles wide with a surface area of about 225 square miles.[50] An extensive regional aquitard[51] occurs in the northern areas of the subbasin at depths ranging from about 100 feet near the forebay[52] to about 150 to 250 feet in the northern areas of subbasin and beneath San Francisco Bay.[53] The thickness of this regional aquitard varies from about 20 feet to over 100 feet. The southern area and the margins of the subbasin are unconfined areas, or forebay areas, where clay-rich zones do not restrict recharge. The general groundwater gradient is from the edges of the basin toward San Francisco Bay, or generally in the direction of ground slope.[54]

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45 Santa Clara Basin Watershed Management Initiative, Watershed Management Plan: *Volume I Watershed Characteristics Report Unabridged 2003 Revision,* Chapter 4 Land Use in the Santa Clara Basin, Revised August 2003, p. 4-10, www.valleywater.org/_wmi/related_report/wcr2003r.cfm.

46 The 1.5- to 2-year flood event is the frequency of flood event that corresponds to the flood or near-bankfull depth. The bankfull depth corresponds to stream flow just when water just begins to leave the channel and spread onto the floodplain.

47 Santa Clara Basin Watershed Management Initiative, Watershed Management Plan: *Volume I Watershed Characteristics Report Unabridged 2003 Revision,* Chapter 4 Land Use in the Santa Clara Basin, Revised August 2003, pp. 4-10 to 4-11, www.valleywater.org/_wmi/related_report/wcr2003r.cfm.

48 California Department of Water Resources, *California Groundwater Bulletin 118,* San Francisco Bay Hydrologic Region, Santa Clara Valley Groundwater Basin, February 2004, p. 1, http://www.dpla2.water.ca.gov/publications/groundwater/bulletin118/basins/pdfs_desc/2-9.02.pdf, accessed October 9, 2007.

49 Santa Clara Valley Water District, *Groundwater Conditions 2001,* July 2002, p. 7, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

50 Santa Clara Valley Water District, *Groundwater Conditions 2001,* July 2002, p. 7, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

51 An aquitard is an impermeable confining layer that hydrologically separates upper areas from lower portions.

52 The forebay is the area where large amounts of surface water can recharge the groundwater through infiltration.

53 Santa Clara Valley Water District, *Groundwater Conditions 2001,* July 2002, p. 7, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

54 Santa Clara Valley Water District, *Groundwater Conditions 2001,* July 2002, p. 7, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

The Subbasin has two main water-bearing units; the geologically recent alluvium and the Santa Clara formation, which is described in Section 3.10, Geology, Soils, and Seismicity. The alluvium is the most important water-bearing unit in the subbasin. Its permeability generally is high and nearly all large production wells draw from this unit. A confined zone exists in the northern portion of the Subbasin where there is an overlying clay layer of low permeability (described in Section 3.10, Geology, Soils, and Seismicity). Principal aquifer zones are aquifer zones from which most water is pumped for beneficial uses. These aquifer zones are deeper than upper aquifer zones (below 150 feet bgs) and are typically under confined or semi-confined conditions. The underlying Santa Clara Formation rests on impermeable rocks (such as the Page Mill basalt) and forms the bottom of the Subbasin. Well logs indicate that the permeability of the formation increases from west to east, although in the center of the Subbasin, permeability decreases with depth.

Excessive reliance on groundwater for water supply uses in the past resulted in lowering of the groundwater table and subsequent land subsidence. The SCVWD now manages groundwater and surface water supplies to protect groundwater resources and maximize water supply reliability. Use of groundwater is currently off-set by artificial recharge in addition to natural recharge, as described below.[55]

Natural Recharge. Natural recharge occurs principally as infiltration from streambeds that exit the upland areas in the drainage basin and from direct percolation of precipitation that falls on the basin floor.[56] In the Santa Clara Subbasin, the natural recharge to the primary water supply aquifer is estimated through the use of a groundwater flow model, which produced an estimate of approximately 26,000 acre-feet of natural recharge for 2001.[57]

Artificial Recharge. To balance groundwater extraction, the SCVWD conducts artificial recharge operations along water supply facilities, including streams and off-stream ponds.[58] By releasing local and imported waters from local reservoirs or the distribution system, the SCVWD significantly enhances the recharge in these facilities. Through artificial recharge operations, approximately 129,100 acre-feet of water recharged the groundwater subbasins through water supply recharge facilities in 2001.[59] Approximately 90,700 acre-feet of water recharged the Santa Clara Subbasin through artificial recharge operations; this includes 40,700 acre-feet through off-stream ponds and 50,000 acre-feet through the in-stream recharge program.[60]

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55 Santa Clara Valley Water District, *Groundwater Conditions 2001,* July 2002, p. 8, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

56 California Department of Water Resources., *California Groundwater Bulletin 118,* San Francisco Bay Hydrologic Region, Santa Clara Valley Groundwater Basin, February 2004, p. 2, http://www.dpla2.water.ca.gov/publications/groundwater/bulletin118/basins/pdfs_desc/2-9.02.pdf, accessed October 9, 2007.

57 Santa Clara Valley Water District, *Groundwater Conditions 2001,* July 2002, p. 9, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

58 Santa Clara Valley Water District, *Groundwater Conditions 2001,* July 2002, p. 1-2, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

59 Santa Clara Valley Water District, *Groundwater Conditions 2001,* July 2002, p. 9, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

60 Santa Clara Valley Water District, *Groundwater Conditions 2001,* July 2002, p. 9, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

Groundwater levels in the areas surrounding the SUMC Sites are about 40 to 70 feet below ground surface (bgs).[61] The area is not in a natural groundwater recharge area[62] or near any artificial recharge areas.[63] However, estimated annual recharge from San Francisquito Creek is about 950 acre feet per year (AFY). Of this amount, about 322 AFY of recharge is from the reach of San Francisquito Creek that receives discharges from the area.[64]

Groundwater Quality. Groundwater quality in the Santa Clara Subbasin is considered to be very good and water quality objectives are met in most wells.[65] Drinking water standards are met at public supply wells without the use of treatment methods.[66] Although this groundwater is only used for drinking water supplies by the City of Palo Alto during droughts and emergencies, it is used more regularly for potable water supplies by several other agencies in the SVCWD.

The mineral character of the groundwater Subbasin is dominated by calcium, magnesium, and bicarbonate. Typical TDS concentrations in the primary water supply aquifers are below the recommended drinking water standard (Maximum Contaminant Level [MCL]), which is 500 milligrams per liter (mg/L). Concentrations in the upper zones are higher, with typical concentrations ranging from 490 to 860 mg/L.[67]

There is no drinking water standard for water hardness, but common problems with hard water are scaly residues on fixtures and difficulty in lathering of soaps. Water hardness concentrations of less than or equal to 60 mg/L as calcium carbonate are generally classified as 'soft' or 'slightly hard' water. Waters with hardness of 60 to 180 are considered 'moderately hard' to 'hard', and water with a hardness of over 180 is classified as 'hard.' Water in the Subbasin is very 'hard', with typical concentrations ranging from 205 to 557 mg/L.

Manganese is a naturally occurring constituent in drinking water. The drinking water standard for manganese is 50 micrograms per liter (µg/L). Manganese is not a health concern at concentrations typically found in groundwater, but can cause black to brown staining or a bitter metallic taste. Generally, manganese concentrations in the Subbasin are below drinking water standards; however,

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61 Santa Clara Valley Water District, *Groundwater Conditions 2001,* Figure 3-3 and 2-4. July 2002, p. 21-22, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

62 EIP Associates, *City of Palo Alto/Stanford Development Agreement and Lease EIR*, Figure 3.12-2: Watersheds and Ground Recharge Areas, March 2005.

63 Santa Clara Valley Water District, *Groundwater Conditions 2001,* Figure 2-4 District In-Stream and Off-Stream Recharge Facilities, July 2002, p. 15, www.valleywater.org/media/pdf/ GWConditions2001.pdf, accessed October 9, 2007.

64 Loren F. Metzger, *Streamflow Gains and Losses along San Francisquito Creek and Characterization of Surface-Water and Ground-Water Quality, Southern San Mateo and Northern Santa Clara Counties, California, 1996-97,* US Geological Survey Water-Resources Investigation Report 02-4078, 2002, p. 39.

65 Santa Clara Valley Water District, *Groundwater Conditions 2001,* July 2002, p. 44, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

66 California Department of Water Resources, *California Groundwater Bulletin 118,* San Francisco Bay Hydrologic Region, Santa Clara Valley Groundwater Basin, February 2004, p. 3, http://www.dpla2.water.ca.gov/publications/groundwater/bulletin118/basins/pdfs_desc/2-9.02.pdf, accessed October 9, 2007.

67 Santa Clara Valley Water District, *Groundwater Conditions 2001,* July 2002, pp. 36-37, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

concentrations above 50 μg/L were detected in seven wells in the principal aquifer zone, and six wells in the upper aquifer zone.[68]

Many of the coastal groundwater basins experience some form of saltwater encroachment into fresh water aquifers. A zone of saltwater intrusion has been observed along the San Francisco Bay, in the northern portion of the Subbasin, but currently is considered stable. The SUMC Sites are not in or near this saltwater intrusion zone.[69]

Nitrate in groundwater comes from both natural sources and human sources. Nitrate is very soluble in water so it readily dissolves in rainfall or irrigation water that infiltrates to groundwater. Small amounts of nitrates in groundwater (less than 10 mg/L) are normal, but higher concentrations indicate contamination. The drinking water standard for nitrate is 45 mg/L, which is based on protecting infants and others particularly sensitive to high nitrate concentrations. Typical nitrate concentrations in the principal aquifer of the Subbasin are 12 to 16 mg/L, which indicate human impacts on nitrate concentrations in groundwater. Nitrate concentrations in the upper aquifer zone, however, are typically less than 10 mg/L.[70] Consequently, the lower aquifer contamination is considered to be from historic nitrate sources rather than on-going contamination.

Iron, fluoride, turbidity, boron, and other inorganic constituents generally do not exceed drinking water standards where applicable. No organic radiological constituents exceeded drinking water standards in the Santa Clara Subbasin.[71]

Contaminated groundwater is usually caused by land uses that resulted in releases of hazardous materials or hazardous wastes into soils or sewer systems or by naturally occurring geochemistry. Leaking underground storage tanks, pipes, and sumps are common causes of such contaminated conditions, as are historic industrial activities that routinely include spills, disposal, or intentional discharges of hazardous materials or waste. Portions of the area surrounding the SUMC Sites contain known hazardous materials contamination. See Section 3.12, Hazardous Materials, for further explanation of these issues.

Climate, topography, geology, and land use can all affect groundwater conditions. Fill soils can be composed of a variety of materials of various quality. Rainfall percolation though these materials can pick up various constituents as it is infiltrating, and carry these constituents to the groundwater. However, the soils in the area have low permeabilities (stiff clays and dense, compacted sands); consequently, precipitation is more likely to flow overland than infiltrate to groundwater.

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68 Santa Clara Valley Water District, *Groundwater Conditions 2001,* July 2002, pp. 37-38, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

69 Santa Clara Valley Water District, *Groundwater Conditions 2001,* Figure 5-4 Extent of Saltwater Intrusion in Upper Aquifer Zone, July 2002, pp. 38 and 54, www.valleywater.org/media/pdf/GWConditions 2001.pdf, accessed October 9, 2007.

70 Santa Clara Valley Water District, *Groundwater Conditions 2001,* July 2002, pp. 39-40, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

71 Santa Clara Valley Water District, *Groundwater Conditions 2001,* July 2002, pp. 38-39, 41-43, available at www.valleywater.org/media/pdf/GWConditions2001.pdf, accessed October 9, 2007.

SUMC Sites

Site-specific hydrology and water quality characteristics related to the SUMC Sites are described below.

Ground Features. Soils at the Main SUMC Site are composed of sand, clay, and gravel.[72] Soils at the Hoover Pavilion Site are composed of a layer of fill (silt, sand, and gravel), underlain by layers of deposited sand and gravels with varying amounts of silt at 25 to 35 feet bgs and silt, clay, and clayey sand at about 38 to 40 feet bgs.[73] The SUMC Sites are in a Hydromodification Management Plan (HMP) area defined as less than 65 percent impervious surfaces and 90 percent built out,[74] although the estimated amount of impervious surfaces on the SUMC Sites is approximately 70 percent, or about 49 acres.[75] The existing uses consist primarily of medical buildings (containing clinical, research, and hospital uses), parking lots and garages, and roadways, with landscaping (about 27 percent of the area with an additional 3 percent of green roofs) (see Section 2, Project Description).

Surface Water Drainage. The SUMC Sites are flat (slope is less than one percent at both the Main SUMC Site and the Hoover Pavilion Site) and overland flow generally drains towards the east.[76] The majority of runoff from the Main SUMC Site is collected in the Stanford University local storm drainage system and conveyed to the Sand Hill Road trunk line that discharges at one location to San Francisquito Creek.[77] This storm drain system has capacity to accommodate runoff from the 6-hour 10-year storm event (see Section 3.15, Utilities, of this EIR). Runoff from the Hoover Pavilion Site is conveyed in a local Stanford University storm drain system that is then routed into the Stanford Shopping Center area of the City of Palo Alto San Francisquito Creek Storm Drain system, prior to discharge at one location into San Francisquito Creek.[78] San Francisquito Creek is about 0.25 miles north of the Main SUMC Site and 0.3 miles north of the Hoover Pavilion Site.

Groundwater. Groundwater in the area is typically a layered aquifer with the shallowest aquifer being an unconfined water table aquifer. Below this layer are multiple layers that are considered semi-confined to confined aquifers.[79] The shallowest aquifer, which would most directly impact or be

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72 Rutherford and Chekene Consulting Engineers, *Geotechnical Investigation Final Report, Stanford Hospital & Clinics,* December 24, 2008, p. 11.

73 Rutherford and Chekene Consulting Engineers, *Geotechnical Investigation Final Report, Stanford Hospital & Clinics,* December 24, 2008, p. 6, 11.

74 Santa Clara Valley Urban Runoff Pollution Prevention Program, *HMP Applicability Maps, Palo Alto,* April 20, 2006, http://www.scvurppp-w2k.com/hmp_maps.htm, accessed October 9, 2007.

75 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 4, Figure 4-8a.

76 US Geological Survey, *Topographic Map, Menlo Park, California, United States,* July 1, 1998.

77 EIP Associates, *Certified Environmental Impact Report Stanford Sand Hill Road Corridor Projects: Volume 3,* Figure 4.9-2 Storm Drainage Outfalls along the Sand Hill Road Corridor, June 1996, p. 4.9-11.

78 EIP Associates, *Draft Environmental Impact Report Stanford Sand Hill Corridor Projects, Volume 2,* Figure 3-9 Storm Drain Map, July 1996, p. 3-17.

79 Protech Consulting Engineers, *Phase I Environmental Site Assessment Conducted at Welch Road, Palo Alto, California, November 1998,* prepared for the Stanford Management Company, p. 5-2.

impacted by construction on the SUMC Sites, is affected by seasonal rainfall.[80] Groundwater encountered at the Main SUMC Site is over 50 feet bgs.[81] The historical groundwater level at the Main SUMC Site is below 30 feet bgs.[82] Based on field evaluations and historic data, the design groundwater depth is recommended to be 30 feet bgs.[83] At the Hoover Pavilion Site, groundwater movement is primarily to the south[84] and the depth to groundwater is about 38-53 feet bgs.[85,86,87] An aquitard is present at about 51.5 to 60.5 feet bgs.[88]

Soil and Groundwater Quality. Three underground storage tanks containing diesel and waste oil were found to have contaminated local soil and groundwater at the Hoover Pavilion Site (see Section 3.12, Hazardous Materials, for more information). The main constituent of concern is primarily degraded TPH-D (diesel fuel). Two tanks have since been closed in place and one removed.[89] An additional waste oil tank was not found to be leaking and closed in place. Passive free-product removal (natural attenuation) is used for remediation of soil and groundwater because vertical and lateral spread are stable, the extent of contamination is known, groundwater movement is understood, and no groundwater supply wells are within 0.5 mile of the site.[90]

Applicable Plans and Regulations

This section describes the federal, State, and local regulations and policies that are applicable to the SUMC Project.

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80 Protech Consulting Engineers, *Phase I Environmental Site Assessment Conducted at Welch Road, Palo Alto, California, November. 1998,* prepared for the Stanford Management Company, p. 5-2.

81 Rutherford and Chekene Consulting Engineers, *Geotechnical Investigation Final Report, Stanford Hospital & Clinics,* December 24, 2008, p. 11.

82 Rutherford and Chekene Consulting Engineers, *Geotechnical Investigation Final Report, Stanford Hospital & Clinics,* December 24, 2008, p. 11.

83 Rutherford and Chekene Consulting Engineers, *Geotechnical Investigation Final Report, Stanford Hospital & Clinics,* December 24, 2008, p. 12.

84 Einarson Geoscience, Inc., *Hydrocarbon Investigation Report Hoover Pavilion Site, Stanford Health Services, Stanford, California,* May 1995, p.2.

85 Einarson Geoscience, Inc., *Hydrocarbon Investigation Report Hoover Pavilion Site, Stanford Health Services, Stanford, California,* May 1995, p.2-4.

86 Conor Pacific, First Quarter 2001 *Groundwater Monitoring Results, Hoover Pavilion Stanford Hospital and Clinics, Stanford, California,* April 2001, p. 1.

87 Geomatrix, *Phase I Environmental Assessment: Hoover Pavilion 211 and 215 Quarry Road Palo Alto, California,* September 2007, p. 3.

88 Conor Pacific, First Quarter 2001 *Groundwater Monitoring Results, Hoover Pavilion Stanford Hospital and Clinics, Stanford, California,* April 2001, p. 1.

89 Geomatrix, *Phase I Environmental Assessment: Hoover Pavilion 211 and 215 Quarry Road Palo Alto, California,* September 2007, p. 7-9.

90 Einarson Geoscience, Inc., *Hydrocarbon Investigation Report Hoover Pavilion Site, Stanford Health Services, Stanford, California,* May 1995, p. 7.

Federal Regulations

Clean Water Act. The federal CWA was enacted with the primary purpose of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. The CWA directs states to establish water quality standards for all "waters of the United States" and to review and update such standards on a triennial basis. Section 319 mandates specific actions for the control of pollution from non-point sources. The EPA has delegated responsibility for implementation of portions of the CWA, including water quality control planning and control programs, such as the National Pollutant Discharge Elimination System (NPDES) Program, to the State Water Resources Control Board and the Regional Water Quality Control Board. These programs are explained in more detail in the State Regulations section.

Section 303(c)(2)(b) and Water Quality Standards. Section 303(c)(2)(b) of the CWA requires states to adopt water quality standards for all surface waters of the United States based on the water body's designated beneficial use. Where multiple uses exist, water quality standards must protect the most sensitive use. Water quality standards are typically numeric, although narrative criteria based upon biomonitoring methods may be employed where numerical standards cannot be established or where they are needed to supplement numerical standards. Water quality standards applicable to the SUMC Project are listed in the Water Quality Control Plan for the San Francisco Bay Basin (SFB Basin Plan).

Section 303(d) and Total Maximum Daily Loads. Section 303(d) of the CWA bridges the technology-based and water quality-based approaches for managing water quality. Section 303(d) requires that states make a list of waters that are not attaining standards after the technology-based limits are put into place. For waters on this list (and where the U.S. EPA administrator deems they are appropriate), states are to develop TMDL. TMDLs are established at the level necessary to implement the applicable water quality standards. A TMDL must account for all sources of the pollutants that caused the water to be listed. Federal regulations require that the TMDL, at a minimum, account for contributions from point sources (federally permitted discharges, discrete conveyances) and contributions from nonpoint sources (everything other than point sources). Specific TMDLs applicable to the SUMC Project are explained under Regional Regulations, below.

National Pollutant Discharge Elimination System. The goal of the NPDES nonpoint source regulations is to improve the quality of stormwater discharged to receiving waters to the "maximum extent practicable" through the use of best management practices (BMPs). The NPDES permit system was established in the CWA to regulate point source discharges (a municipal or industrial discharge at a specific location or pipe) and certain types of diffuse discharges. As defined in the federal regulations, nonpoint sources are generally exempt from federal NPDES permit program requirements. Nonpoint pollution sources are diffuse and originate over a wide area rather than from a definable point. Nonpoint source pollution often enters receiving water in the form of surface runoff and is not conveyed by way of pipelines or discrete conveyances. Urban stormwater runoff and construction site runoff, however, are diffuse-sources regulated under the NPDES permit program because they discharge to receiving waters at discrete locations. Sections 401 and 402 of the CWA contain general requirements regarding NPDES permits. Section 307 of the CWA describes the factors that the U.S. EPA must consider in setting effluent limits for priority pollutants.

For point-source discharges, each NPDES permit contains limits on allowable concentrations and mass emissions of pollutants contained in the discharge; however, the SUMC Sites would not be considered a point source for regulatory purposes. No features of the SUMC Project would be considered a point source discharge that could require an individual NPDES permit, unless substantial dewatering is required.

For diffuse-source discharges (e.g., municipal stormwater and construction runoff), the NPDES program establishes a comprehensive stormwater quality program to manage urban stormwater and minimize pollution of the environment to the maximum extent practicable. The NPDES program consists of: (1) characterizing receiving water quality; (2) identifying harmful constituents; (3) targeting potential sources of pollutants; and (4) implementing a Comprehensive Stormwater Management Program. The SUMC Project is subject to the Municipal NPDES Permit for the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP), explained below under Regional Regulations.

State Regulations

Responsibility for the protection of water quality in California rests with the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs). The SWRCB establishes statewide policies and regulations for the implementation of water quality control programs mandated by federal and State water quality statutes and regulations. The RWQCBs develop and implement Water Quality Control Plans (Basin Plans) that consider regional beneficial uses, water quality characteristics, and water quality problems. In cases where the Basin Plan does not contain a standard for a particular pollutant, other criteria are used to establish a standard. Other criteria may be applied from SWRCB documents (e.g., the Inland Surface Waters Plan and the Pollutant Policy Document, California Toxics Rule) or from EPA water quality criteria developed under Section 304(a) of the CWA. Numeric criteria are required by the CWA for many priority toxic pollutants. To fill in the gap between the water quality control plans and CWA requirements, on May 18, 2000 the EPA promulgated the California Toxics Rule based on the Administrator's determination that numeric criteria are necessary in the State of California to protect human health and the environment. These federal criteria are numeric water quality criteria for priority toxic pollutants and other provisions for water quality standards, legally applicable in the State of California, for inland surface waters, enclosed bays, and estuaries for all purposes and programs under the CWA.

As explained earlier in this section, water quality standards that apply to the San Francisco Bay Area waters are listed in the SFB Basin Plan. The SUMC Sites discharge into San Francisquito Creek, which flows into the San Francisco Bay South. San Francisquito Creek and San Francisco Bay South are listed as impaired for certain pollutants and the CWA thus requires development of limits (TMDL) to the amount of these pollutants that can be discharged to San Francisquito Creek and the San Francisco Bay South.

Porter-Cologne Water Quality Control Act. The Porter-Cologne Water Quality Control Act establishes the SWRCB and each RWQCB as the principal State agencies for coordinating and controlling water quality in California. Specifically, the Porter-Cologne Act authorizes the SWRCB to adopt, review, and revise policies for all waters of the State (including both surface and groundwaters) and directs the RWQCBs to develop regional Basin Plans. Section 13170 of the California Water Code authorizes the SWRCB to adopt water quality control plans on its own initiative.

The San Francisco Bay RWQCB has the authority to implement water quality protection standards through the issuance of permits for discharges to waters in its jurisdiction. Water quality objectives for the San Francisco Bay and its tributaries are specified in The San Francisco Bay Basin Water Quality Control Plan (SFB Basin Plan) prepared by the RWQCB in compliance with the federal CWA and the State Porter-Cologne Act. The principal elements of the SFB Basin Plan are a statement of beneficial water uses protected under the plan; water quality objectives necessary to protect the designated beneficial water uses; and strategies and time schedules for achieving the water quality objectives. Together, narrative and numerical objectives define the level of water quality that shall be maintained in the region. In instances where water quality is better than that prescribed by the objectives, the State Antidegradation Policy applies (State Board Resolution 68-16: Statement of Policy with Respect to Maintaining High Quality of Waters in California). This policy is aimed at protecting relatively uncontaminated aquatic systems where they exist and preventing further degradation. The State Antidegradation Policy is consistent with the federal Antidegradation Policy, as interpreted by the SWRCB in State Board Order No. 86-17.

The water quality objectives are achieved primarily through the establishment and enforcement of waste discharge requirements. Because the SUMC Sites are in the San Francisco RWQCB's jurisdiction, all discharges to surface water or groundwater are subject to the SFB Basin Plan requirements.

Waste Discharge Requirements. All discharges of waste to waters of the State are subject to regulation under the Porter-Cologne Act. This includes both point and nonpoint source discharges. Non-point source discharges are regulated under Waste Discharge Requirements (WDRs), waivers of WDRs, a basin plan prohibition, or some combination of these administrative tools. Discharges of waste directly to State waters would be subject to an individual NPDES permit, which serves as a WDR. The SUMC Project is subject to the Municipal NPDES Permit and the Construction General Permit, which both serve as WDRs as well. The SUMC Project may be subject to an individual WDR or NPDES permit if construction dewatering is required.

The RWQCBs have primary responsibility for issuing WDRs. The RWQCBs may issue individual WDRs to cover individual discharges or general WDRs to cover a category of discharges. WDRs may include effluent limitations or other requirements that are designed to implement applicable water quality control plans, including designated beneficial uses and the water quality objectives established to protect those uses and prevent the creation of nuisance conditions. Violations of WDRs may be addressed by issuing Cleanup and Abatement Orders (CAOs) or Cease and Desist Orders (CDOs), assessing administrative civil liability, or seeking imposition of judicial civil liability or judicial injunctive relief.

NPDES General Construction Activity Stormwater Permit (Construction General Permit). The SWRCB permits all regulated construction activities under NPDES General Permit for Storm Water Discharges Associated with Construction Activity (Order No. 2009-0009-DWQ, NPDES No. CAR000002), adopted September 2, 2009. Every construction project that disturbs one or more acres of land surface or that are part of a common plan of development or sale that disturbs more than one acre of land surface would require coverage under this Construction General Permit. To obtain coverage under this Construction General Permit, the landowner or other applicable entity must file Permit Registration Documents (PRDs) prior to the commencement of construction activity, which include a Notice of Intent (NOI), Storm Water Pollution Prevention Plan (SWPPP), and other documents required by the Construction General Permit, and mail the appropriate permit fee to the State Water Board. Every regulated construction project, including those that are already covered under the old permit (Water Quality Order No. 98-08-DWQ), would have to get coverage under this current Construction General Permit by July 1, 2010 – this would require a new SWPPP in accordance with revised permit. Because the Project would cumulatively disturb more than one acre, construction of the Project would be subject to this Construction General Permit requirements.

Construction activities subject to the Construction General Permit include clearing, grading, and disturbances to the ground, such as stockpiling or excavation, that result in soil disturbances of at least one acre of total land area. The SWPPP has two major objectives: (1) to help identify the sources of sediment and other pollutants that affect the quality of stormwater discharges; and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater as well as non-stormwater discharges. BMPs are intended to reduce impacts to the Maximum Extent Practicable (MEP), which is a standard created by Congress to allow regulators the flexibility necessary to tailor programs to the site-specific nature of municipal stormwater discharges. Reducing impacts to the MEP generally relies on BMPs that emphasize pollution prevention and source control, with additional structural controls as needed.

This current Construction General Permit differs from Order No. 99-08-DWQ in the following significant ways:

- Rainfall Erosivity Waiver: this General Permit includes the option allowing a small construction site (>1 and <5 acres) to self-certify if the rainfall erosivity value (R value) for their project's given location and time frame compute to be less than or equal to 5.
- Technology-based Numeric Action Levels (NALs): the General Permit includes NALs for pH and turbidity for Risk Level 2 projects.
- Technology-based Numeric Effluent Limitations (NELs): this General Permit contains NELs for pH during any construction phase where there is a high risk of pH discharge and turbidity for all discharges in Risk Level 3. The daily average NEL for turbidity is set at 500 NTU to represent the minimum technology that sites need to employ (to meet the traditional Best Available Technology Economically Achievable (BAT)/ Best Conventional Pollutant Control Technology (BCT) standard and the traditional, numeric receiving water limitations for turbidity.

- Risk-based Permitting Approach: this General Permit establishes three levels of risk possible for a construction site. Risk is calculated in two parts: 1) Project Sediment Risk, and 2) Receiving Water Risk.
- Minimum Requirements Specified: this General Permit specifies more minimum BMPs and requirements that were previously only required as elements of the SWPPP or were suggested by guidance.
- Project Site Soil Characteristics Monitoring and Reporting: this General Permit provides the option for dischargers to monitor and report the soil characteristics at their project location. The primary purpose of this requirement is to provide better risk determination and eventually better program evaluation.
- Effluent Monitoring and Reporting: this General Permit requires effluent monitoring and reporting for pH and turbidity in stormwater discharges. The purpose of this monitoring is to be used to determine compliance with the NELs and evaluate whether NALs included in this General Permit are exceeded.
- Receiving Water Monitoring and Reporting: this General Permit requires some Risk Level 3 dischargers to monitor receiving waters and conduct bioassessments.
- Post-Construction Storm Water Performance Standards: this General Permit specifies runoff reduction requirements for all sites not covered by a Phase I or Phase II Municipal Separate Storm Sewer System (MS4) NPDES permit, to avoid, minimize, and/or mitigate post-construction storm water runoff impacts.
- Rain Event Action Plan: this General Permit requires certain sites to develop and implement a Rain Event Action Plan (REAP) that must be designed to protect all exposed portions of the site within 48 hours prior to any likely precipitation event.
- Annual Reporting: this General Permit requires all projects that are enrolled for more than one continuous three-month period to submit information and annually certify that their site is in compliance with these requirements. The primary purpose of this requirement is to provide information needed for overall program evaluation and pubic information.
- Certification/Training Requirements for Key Project Personnel: this General Permit requires that key personnel (e.g., SWPPP preparers, inspectors, etc.) have specific training or certifications to ensure their level of knowledge and skills are adequate to ensure their ability to design and evaluate project specifications that will comply with General Permit requirements.
- Linear Underground/Overhead Projects: this General Permit includes requirements for all Linear Underground/Overhead Projects (LUPs).

Risk levels are based on a matrix of project sediment risk and receiving water risk.

- Sediment risk is based on estimated soil loss, as calculated by the Revised Universal Soil Loss Equation (RUSLE) where: soil loss of less than 15 tons/acre is considered low risk; soil loss between 15 and 75 is medium risk; and, Soil loss over 75 acres is considered high risk. Receiving water risk is based on whether a project drains to a sediment-sensitive waterbody.

- A sediment-sensitive waterbody is either on the most recent 303d list for waterbodies impaired for sediment; has a USEPA-approved Total Maximum Daily Load implementation plan for sediment; or has the beneficial uses of cold freshwater habitat, fish spawning, and fish migration.
- There are three levels of risk; Risk Level 1 projects will be subject to minimum BMP and visual monitoring requirements; Risk Level 2 projects will be subject to NALs and some additional monitoring requirements; and Risk Level 3 projects will be subject to NELs and more rigorous monitoring requirements such as receiving water monitoring and in some cases bioassessment. Discharge to sediment-sensitive waterbody is automatically at least a Risk Level 2.

Because the SUMC Project discharges to San Francisquito Creek that has been listed as impaired by sediment (2006 303(d) list), it would automatically be classified as either a Risk Level 2 or 3 project, depending upon the calculated erosion potential.

TMDLs – State Application. States are required to assess waters for impairment every two years and develop TMDLs for waterbodies listed as impaired on the 303(d) list, approved by the U.S. EPA. The current approved 303(d) list is the 2006 list, which was approved by the U.S. EPA in June 27, 2007. The 303(d) list includes the pollutant(s) contributing to impairment, sources of impairment, and a completion date for development of TMDLs. In California, the SWRCB has interpreted State law to require that implementation be addressed when TMDLs are incorporated into Basin Plans.

Regional Regulations

San Francisco Bay Basin (Region 2) Water Quality Control Plan (SFB Basin Plan). The San Francisco RWQCB implements a number of federal and State laws, the most important of which are the State Porter-Cologne Water Quality Control Act and the federal CWA. Discharges from the SUMC Sites to surface and ground waters are subject to the SFB Basin Plan requirements including both narrative and numeric water quality objectives.

Designated beneficial uses and associated water quality objectives have been established for San Francisquito Creek, San Francisco Bay South, and the Santa Clara Subbasin in the 2004 SFB Basin Plan prepared by the SFRWQCB, in compliance with the federal CWA and the State Porter-Cologne Water Quality Control Act. The SFB Basin Plan has designated existing and potential beneficial uses for San Francisquito Creek and the San Francisco Bay South.[91] Designated beneficial uses for San Francisquito Creek include cold freshwater habitat; fish migration and spawning; warm freshwater habitat; and wildlife habitat. Potential beneficial uses are water contact and noncontact water

[91] California Regional Water Quality Control Board, San Francisco Bay Region. *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)*. Table 201 Existing and Potential Beneficial Uses of Water Bodies in the San Francisco Bay Region. January 18, 2007.

recreation.[92] The San Francisco Bay South beneficial uses include industrial service supply; ocean, commercial, and sport fishing; estuarine habitat; fish migration; presence of rare and endangered species; wildlife habitat; water contact and nonwater contact recreation; and navigation. Fish spawning also is identified as a potential beneficial use. Designated beneficial uses for the Santa Clara Subbasin are listed in the SFB Basin Plan and include municipal and domestic supply; industrial process supply, industrial service supply, and agriculture.[93]

Because the Project's construction would extend through 2021, discharges from the SUMC Project to San Francisquito Creek or the San Francisco Bay South would be subject to the existing Urban Creeks Pesticide Toxicity TMDL, and San Francisco Bay Mercury TMDLs. On June 22, 2007, SFRWQCB staff released a proposed Basin Plan amendment and supporting staff report incorporating a TMDL for PCBs in all segments of San Francisco Bay. This TMDL has not yet been approved by the SWRCB. The San Francisquito Creek Sediment TMDL was scheduled for completion in 2008;[94] however, it has not yet been completed. TMDLs for the rest of the listed pollutants in San Francisquito Creek and the San Francisco Bay South are scheduled for completion by 2019.[95] Additionally, San Francisquito Creek has been proposed for requiring a trash TMDL.[96] Because construction would extend through 2018, the SUMC Project may be subject to TMDLs for all the other pollutants on the 2006 303(d) list for these water bodies.

Urban Creeks Pesticide Toxicity TMDL. The SFB Basin Plan amendment incorporating a TMDL and water quality attainment strategy for diazinon and pesticide-related toxicity in the Bay Area's urban creeks has been approved by the SWRCB, the Office of Administrative Law, and the U.S. EPA. It was adopted by the RWQCB on November 16, 2005 (Final Resolution #R2-2005-0063). Although the U.S. EPA phased out urban diazinon applications at the end of 2004, other pesticides may now pose potential water quality and sediment quality concerns because they are used as diazinon replacements and because pesticide regulatory programs, as currently implemented, allow pesticides to be used in ways that threaten water quality.

The numeric targets interpret the applicable narrative objectives in terms of quantitatively measurable water quality parameters. This target shall be met at all urban creek locations, including those near storm drain outfalls where urban runoff enters receiving waters. The diazinon concentration target is

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92 California Regional Water Quality Control Board, San Francisco Bay Region. *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)*. Table 2-1 Existing and Potential Beneficial Uses of Water Bodies in the San Francisco Bay Region. January 18, 2007.

93 California Regional Water Quality Control Board, San Francisco Bay Region. *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)*. Table 2-2 Existing and Potential Beneficial Uses of Groundwater in Identified Basins. January 18, 2007.

94 San Francisco Bay Regional Water Quality Control Board, *2006 CWA Section 303(d) List of Water Quality Limited Segments, San Francisco Bay Region*. U.S. EPA. Approved June 27, 2007. p. 25. http://www.waterboards.ca.gov/tmdl/docs/303dlists2006/final/r2_final303dlist.pdf. accessed October 9, 2007.

95 San Francisco Bay Regional Water Quality Control Board, *2006 CWA Section 303(d) List of Water Quality Limited Segments, San Francisco Bay Region*. U.S. EPA Approved June 27, 2007. p. 24-25. http://www.waterboards.ca.gov/tmdl/docs/303dlists2006/final/r2_final303dlist.pdf. accessed October 9, 2007.

96 San Francisco Bay Regional Water Quality Control Board, February 11, 2009.

as follows: diazinon concentrations in urban creeks shall not exceed 100 nanograms per liter (ng/l) as a one-hour average. The target addresses both acute and chronic diazinon-related toxicity.

NPDES permits for urban runoff management agencies and similar entities responsible for controlling urban runoff shall require implementation of BMPs and control measures for urban pesticides. Requirements in each NPDES permit issued or reissued and applicable for the term of the permit shall be based on an updated assessment of control measures intended to reduce pesticides in urban runoff. Control measures implemented by urban runoff management agencies and other entities (except construction and industrial sites) shall reduce pesticides in urban runoff to the maximum extent practicable. If these requirements prove inadequate to meet the targets and allocations, the SWRCB will require additional control measures or call for additional actions by others until the targets and allocations are attained.

San Francisco Bay Mercury TMDL. A regional mercury TMDL was prepared and approved by the RWQCB in 2004. On July 17, 2007, the SWRCB approved this TMDL as a Basin Plan Amendment (SWRCB Resolution No. 2007-0045). To achieve the human health and wildlife targets and to attain water quality standards, the Bay-wide suspended sediment mercury concentration target is 0.2 milligrams of mercury per kilogram of dry sediment. The human health target is a fish tissue mercury concentration (0.2 milligrams of mercury per kilogram of fish tissue).

The year 2003 estimate of total mercury inputs to the San Francisco Bay is about 1,220 kilograms per year (kg/yr). The Bay would attain applicable water quality standards for mercury when the overall mercury load is reduced to the TMDL (700 kg/yr) and mercury methylation control measures are implemented. The Santa Clara Valley Urban Runoff Pollution Prevention Program allocation is 23 kg/year and the load reduction is 21 kg/yr. The City of Palo Alto load allocation is 0.38 kg/yr and the City interim and final load allocation is 0.31 kg/yr (0.07 kg/yr load reduction).

The wasteload allocations are implemented through the NPDES stormwater permits issued to urban runoff management agencies. The NPDES permits for urban runoff management agencies require the implementation of BMPs and control measures designed to achieve the allocations or accomplish the load reductions derived from the allocations. In addition to controlling mercury loads, BMPs or control measures shall include actions to reduce mercury-related risks to humans and wildlife.

California Regional Water Quality Control Board San Francisco Bay Region Municipal Regional Stormwater NPDES Permit (Municipal Regional Permit). The Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) is an association of 13 cities and towns in the Santa Clara Valley, together with Santa Clara County and the Santa Clara Valley Water District (Santa Clara Permittees). The Santa Clara Permittees, along with the Contra Costa Permittees, San Mateo Permittees, Alameda Permittees, Fairfield-Suisun Permittees, and Vallejo Permittees are all permitted under Phase I for municipal stormwater and urban runoff discharges under NPDES Permit No. CAS612008, Order No. Order R2-2009-0074, adopted October 14, 2009. One of the primary objectives of the regulations for pollutant dischargers is the reduction of pollutants in urban stormwater through the use of structural and nonstructural BMPs. The Municipal Regional Permit requires the Permittees, including the City of Palo Alto and unincorporated areas of Santa Clara County, to addresses eight general control measures associated with construction and operational activities, including (1) public education and outreach; (2) public participation/involvement; (3) illicit discharge detection and elimination; (4) construction site stormwater runoff control for sites greater than 1 acre; (5) post-construction stormwater management in new development and redevelopment; and (6) pollution prevention/good housekeeping for municipal operations, (7) water quality monitoring; and (8) implementation of controls to meet TMDLs. These control measures are implemented through the use of BMPs.

Regulated Projects, as defined in the Municipal Regional Permit (Provision C.3.b.), are required to implement Low Impact Development (LID) source control BMPs, site design BMPs, and stormwater treatment BMPs, onsite or at a joint stormwater treatment facility in accordance with Provisions C.3.c and C.3.d, unless the Provision C.3.e alternate compliance options are evoked. Regulated Projects must provide permanent/post-construction treatment controls for stormwater according to specific calculations. Regulated Projects include development or redevelopment projects, such as public projects, that create or replace 10,000 square feet and greater of impervious surfaces. If redevelopment results in an alteration of more than 50 percent of the existing impervious surfaces, permanent BMPs must be implemented to treat runoff from the entire project site. The SUMC Project would create or replace more than 10,000 square feet of impervious surfaces and likely alter more than 50 percent of the existing impervious surfaces. Therefore the SUMC Project would be a Regulated Project and likely subject to requiring water quality BMPs for the entire SUMC Sites.

- Low Impact Development (LID) (C.3.c). The goal of LID is to reduce runoff and mimic a site's predevelopment hydrology by minimizing disturbed areas and impervious cover and then infiltrating, storing, detaining, evapotranspiring, and/or biotreating stormwater runoff close to its source. LID employs principles such as preserving and recreating natural landscape features and minimizing imperviousness to create functional and appealing site drainage that treats stormwater as a resource, rather than a waste product. All Regulated Projects must comply with minimum LID requirements.

  In accordance with the Municipal Regional Permit Provision C.3.c.i. Low Impact Development (LID), as a Regulated Project, the SUMC Project would have to comply with the following minimum LID requirements, unless all discretionary permits have been obtained by December 1, 2011:

  (1) Source Control Requirements. All Regulated Projects must implement source control measures onsite that at a minimum, shall include the following:

    (a) Minimization of stormwater pollutants of concern in urban runoff through measures that may include plumbing of the following discharges to the sanitary sewer, subject to the local sanitary sewer agency's authority and standards:

      - Discharges from indoor floor mat/equipment/hood filter wash racks or covered outdoor wash racks for restaurants;
      - Dumpster drips from covered trash, food waste and compactor enclosures;

- Discharges from covered outdoor wash areas for vehicles, equipment, and accessories;
- Swimming pool water, if discharge to onsite vegetated areas is not a feasible option; and
- Fire sprinkler test water, if discharge to onsite vegetated areas is not a feasible option;

(b) Properly designed covers, drains, and storage precautions for outdoor material storage areas, loading docks, repair/maintenance bays, and fueling areas;

(c) Properly designed trash storage areas;

(d) Landscaping that minimizes irrigation and runoff, promotes surface infiltration, minimizes the use of pesticides and fertilizers, and incorporates other appropriate sustainable landscaping practices and programs such as Bay-Friendly Landscaping;

(e) Efficient irrigation systems; and

(f) Storm drain system stenciling or signage.

(2) Site Design and Stormwater Treatment Requirements.

(a) Each Regulated Project shall be required to implement at least the following design strategies onsite:

(i) Limit disturbance of natural water bodies and drainage systems; minimize compaction of highly permeable soils; protect slopes and channels; and minimize impacts from stormwater and urban runoff on the biological integrity of natural drainage systems and water bodies;

(ii) Conserve natural areas, including existing trees, other vegetation, and soils;

(iii) Minimize impervious surfaces;

(iv) Minimize disturbances to natural drainages; and

(v) Minimize stormwater runoff by implementing one or more of the following site design measures:

- Direct roof runoff into cisterns or rain barrels for reuse.
- Direct roof runoff onto vegetated areas.
- Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas.
- Direct runoff from driveways and/or uncovered parking lots onto vegetated areas.
- Construct sidewalks, walkways, and/or patios with permeable surfaces.

- Construct driveways, bike lanes, and/or uncovered parking lots with permeable surfaces.

(b) Each Regulated Project must treat 100 percent of the amount of runoff identified in Provision C.3.d for the Regulated Project's drainage area with LID treatment measures onsite or with LID treatment measures at a joint stormwater treatment facility.

(i) LID treatment measures are harvesting and re-use, infiltration, evapotranspiration, or biotreatment.

(ii) A properly engineered and maintained biotreatment system may be considered only if it is infeasible to implement harvesting and re-use, infiltration, or evapotranspiration at a project site.

(iii) Infeasibility to implement harvesting and re-use, infiltration, or evapotranspiration at a project site may result from conditions including the following:

- Locations where seasonal high groundwater would be within 10 feet of the base of the LID treatment measure.
- Locations within 100 feet of a groundwater well used for drinking water.
- Development sites where pollutant mobilization in the soil or groundwater is a documented concern.
- Locations with potential geotechnical hazards.
- Smart growth and infill or redevelopment sites where the density and/or nature of the project would create significant difficulty for compliance with the onsite volume retention requirement.
- Locations with tight clay soils that significantly limit the infiltration of stormwater.

(vi) Biotreatment systems shall be designed to have a surface area no smaller than what is required to accommodate a 5 inches per hour stormwater runoff surface loading rate.

(vii) Green roofs may be considered biotreatment systems that treat roof runoff only if they meet certain minimum specifications submitted by the Permittees and approved by the RWQCB.

- Numeric Sizing Criteria for Stormwater Treatment Systems (C.3.d). Stormwater treatment measures must be numerically sized in accordance with criteria identified under Provision C.3.d. The permittees must also verify that infiltration devices are designed and installed such that they would not cause or contribute to the degradation of groundwater quality at project sites. An infiltration device is any structure that is deeper than wide and designed to infiltrate stormwater into the subsurface and, as designed, bypass the natural groundwater protection afforded by surface soil. Specific requirements are specified in Provision C.3.d.iv.(2).

- Hydromodification Management (C.3.g). For projects where increased flow and/or volume is likely to cause increased erosion of creek beds and banks, silt pollutant generation, or other impacts to beneficial uses, NPDES permit provisions require managing such increases in peak runoff flow and increased runoff volume. A Hydromodification Management (HM) Project is a Regulated Project that creates and/or replaces one acre or more of impervious surface and are not specifically excluded within the requirements of Attachments B–F of the Municipal Regional Permit. HM Projects are subject to the HM Standard such that stormwater discharges from HM Projects shall not cause an increase in the erosion potential of the receiving stream over the pre-project (existing) condition. A project that does not increase impervious surface area over the pre-project condition is not an HM Project. The SUMC Sites are located within an HM exempt area on the County HM map and the SUMC Project would not increase impervious area over the pre-project condition. Therefore, the SUMC Project is not an HM Project subject to the HM Standard or HM controls.

Additionally, this Municipal Regional Permit incorporates requirements for TMDLs and other pollutant source load reductions within the San Francisco Bay Region including: Pesticides Toxicity Control (C.9.), Trash Load Reduction (C.10.), Mercury Controls (C.11.), Polychlorinated Biphenyls (PCBs) Controls (C.12.), Copper Controls (C.13.), Polybrominated Diphenyl Ethers (PBDE), Legacy Pesticides and Selenium (C.14.).

Santa Clara Valley Water District (SCVWD). The SCVWD reviews plans for land development projects near streams for proposed on-site drainage systems, wastewater disposal systems, and potable water supply, as well as for all new or upgraded facilities that may be required off site in the City of Palo Alto or County as a result of the development (see further explanation under NPDES permit, above). The SCVWD reviews projects for conformance with SCVWD flood control design criteria, stream maintenance and protection plans, and groundwater protection programs. The SCVWD coordinates its efforts with federal, State, other Santa Clara County and City agencies such as FEMA, San Francisco RWQCB, and the Department of Environmental Health, to promote health and safety through the effective management of water resources. Groundwater in the basin is managed through the Groundwater Management Plan (2001).

City of Palo Alto Comprehensive Plan. The applicable policies are addressed in Section 2, Project Description, and Section 3.2, Land Use.

City of Palo Alto Municipal Code. Three chapters of the Municipal Code containing directives related to the quality and quantity of off-site water discharge are in Title 16 – Building Regulations: Chapter 16.09 – *Sewer Use Ordinance*, Chapter 16.11 – *Stormwater Pollution Prevention*, and Chapter 16.28 - *Excavations, Grading, and Fills*. These chapters are explained in more detail below.

- *Sewer Use Ordinance*. The overall goal of Chapter 16.09 is to prevent/control pollution and protect/foster human health and the environment. The specific purpose is to prevent the discharge of any pollutant into the sewer system, the storm drain system, or surface waters, which would obstruct or damage the collection system; interfere with, inhibit or disrupt the Palo Alto Regional Water Quality Control Plant, its treatment processes, operations, or sludge processes, use or disposal; pass through the treatment system and contribute to violations of the regulatory requirements placed upon the plant; or result in harm to or threaten to deteriorate human health or the environment.

- *Stormwater Pollution Prevention*. Chapter 16.11 is necessary to protect the health and safety of the residents of Palo Alto and the surrounding region from water quality degradation caused by stormwater runoff. Chapter 16.11 is implemented in a manner consistent with the requirements of the San Francisco RWQCB and is supplemental to the requirements of Chapter 16.09 with respect to stormwater.
- *Excavations, Grading, and Fills*. The City's erosion and sediment control ordinance is contained in Chapter 16.28, *Excavations, Grading, and Fills*, of the Municipal Code. The Projects would require a *Grading and Excavation Permit*. All land-disturbing or land-filling activities or soil storage must be undertaken in a manner designed to reduce surface runoff, erosion, and sedimentation to a minimum amount. An interim erosion and sediment control plan and SWPPP are required and must contain descriptions of surface runoff and erosion control measures to be implemented. The final erosion and sediment control plan and SWPPP must include a description of permanent control measures to improve the quality of stormwater runoff from the sites.
- *Palo Alto Regional Water Quality Control Plan Enforcement Response Plan*. Stanford University has, in a written contract, agreed to comply with the Palo Alto Sewer Use Ordinance and the federal (EPA) Pretreatment Standards, even though most of the campus lies outside of the City of Palo Alto limits in an unincorporated area of Santa Clara County. Therefore, the same procedures are used for enforcement on the Stanford Campus as are used for industrial facilities.

City of Palo Alto Urban Runoff Management Plan. The City of Palo Alto Urban Runoff Management Plan (URMP), revised June 4, 2007, includes performance standards for meeting requirements of the Municipal NPDES Permit. The SUMC Project is a Group 1 Project[97] subject to the URMP requirements for construction and operation performance standards. These are described in more detail in the impact analysis.

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[97] The SUMC Project is a Significant Redevelopment project, and as such, is a Group 1 project. Where there is an increase or replacement of more than 50 percent of the impervious surface of a previously existing development, and the existing development was not subject to stormwater treatment measures, the entire project site must be included in the treatment measure design.

Impacts and Mitigation Measures

Significance Criteria

Based on significance thresholds determined by the City of Palo Alto, the SUMC Project would result in a significant drainage or water quality impact if it would:

- Substantially impede or redirect flood flows through placement of structures in the 100-year flood hazard area;
- Substantially degrade or deplete groundwater resources or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level;
- Substantially increase the rate, volume, or flow duration of stormwater runoff or alter the existing drainage pattern or the site or area, including altering the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site, including increased in-stream erosion;
- Significantly increase the rate, volume, or flow duration of stormwater runoff in a manner which would result in new or increased flooding on- or off-site, or exceedance of the capacity of existing or planned stormwater drainage systems in local streams;
- Provide substantial additional sources of pollutants associated with urban runoff or otherwise substantially degrade surface or groundwater quality;
- Expose people or structures to a significant risk or loss, injury or death involving flooding by placing housing or other development in a 100-year flood hazard area or a levee or dam failure inundation area;
- Result in stream bank instability; or
- Violate any water quality standards or waste discharge requirements.

Environmental Analysis

HW-1. Flood Risk and Flood Flows. The SUMC Project would have no impact on flood risk or flood flows. (NI)

The SUMC Sites are not in a 100-year flood hazard area and, therefore, placement of structures on the SUMC Sites would not impede or redirect flood flows. There would be no impact.

HW-2. Groundwater Recharge and Local Water Table. The SUMC Project would have a less-than-significant impact on groundwater recharge and the local groundwater table level. (LTS)

Construction. The SUMC Project could affect the local groundwater table levels if groundwater dewatering were implemented for construction of underground structures.

Additionally, the SUMC Project could affect groundwater recharge if more impervious surfaces are created such that substantial infiltration of rain and runoff is prevented.

Local Groundwater Table Levels. During construction of the SUMC Project, construction dewatering may be necessary for construction of underground parking and any deep building foundations. This construction dewatering may temporarily affect the local, perched groundwater table. Underground parking structures would extend about four levels below grade (about 41 feet bgs). As noted in the Setting, the design local groundwater table[98] is recommended to be about 30 feet bgs at the Main SUMC Site. Groundwater levels fluctuate depending upon local climate conditions. Water may also pond in excavated pits and trenches during the wet season because of slow permeability soils. In accordance with the Public Works policy adopted in 2008, the Public Works Department does not generally allow groundwater dewatering during the wet season (November through March).

The Public Works Department only allows dewatering of excavations using drawdown well systems.[99] Open pit groundwater dewatering[100] is not allowed and dewatering is only permitted from April through October. The contractor must determine the depth to groundwater immediately prior to excavation by using a piezometer, or by drilling an exploratory hole if the deepest excavation will be within 3 feet of the highest anticipated groundwater level. If groundwater is within 3 feet of the deepest excavation, a drawdown well dewatering system must be used. The Public Works Department may require the extracted groundwater to be tested for contaminants prior to initial discharge and at intervals during dewatering. If testing is required, the contractor must retain an independent testing firm to test the discharge water for the contaminants specified by the Public Works Department, and submit the results to the Public Works Department. The Public Works Department reviews and approves dewatering plans as part of a Street Work Permit. The applicant can include a dewatering plan in the building permit plan set in order to obtain approval of the plan during the building permit review, but the contractor would still be required to obtain a Street Work Permit prior to dewatering and excavation. Construction of the SUMC Project would have to comply with the Public Works Department groundwater dewatering requirements, if dewatering is necessary. Consequently, potential effects of groundwater dewatering would not be substantial and would be temporary and impacts would be less than significant.

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98 The 'design' local groundwater table depth is the depth to groundwater used for designing building structures based on evidence from geotechnical reports and other sources. Groundwater levels may seasonally, yearly, and spatially fluctuate; groundwater depth is not a constant or necessarily known throughout the entire project site. However, the buildings and structures must be appropriately designed and built for groundwater contact/saturated media conditions if there is a potential for that to occur. The depth at which groundwater is expected to occur is the 'design' groundwater table depth.

99 Drawdown wells are installed around the perimeter of the excavation and pump water out of the shallow aquifer to lower the level of the groundwater so the foundation can be constructed without groundwater filling the excavation.

100 Open pit dewatering systems use in-pit sumps to collect groundwater inflow and pit-wall runoff and seepage.

Groundwater Recharge. During construction, the balance between pervious and impervious land surfaces[101] would repeatedly change. Consequently, there is a potential for a temporary increase in impervious land surfaces and therefore, temporary reduction in groundwater recharge. During much of the construction period, there would be more pervious land surfaces than under existing conditions. At SUMC Project completion, impervious land surface would increase slightly (1 acre, or less than two percent). During a limited time when the new SHC hospital building and FIM1 are complete, and the 1959 Hospital Building complex has not yet been demolished and restored to pervious surfaces, there could be a brief period when impervious land surfaces on the Main SUMC Site would be greater than under existing conditions. However, the SUMC Sites are not in a significant groundwater recharge area.[102] A thick, laterally-extensive layer of bay deposits, consisting of undifferentiated clay interbedded with some lenses of coarse-grained alluvium, act as a confining layer separating the shallow (water table) aquifer from the deep aquifer in the SUMC Sites and vicinity.[103] This confining layer extends under the SUMC Sites.[104] Most of the groundwater recharge in the SUMC Sites vicinity is from flow in San Francisquito Creek or areas to the west of the SUMC Sites. These areas would not be altered during construction of the SUMC Project and they would continue to replenish potential temporary groundwater losses. Therefore, the potential slight change in the amount of impervious land surfaces would not be expected to have a substantial effect on groundwater recharge. Impacts on groundwater recharge during construction would be less than significant.

Operation. The SUMC Project could affect local groundwater table levels if permanent groundwater dewatering is implemented for underground structures. Additionally, the SUMC Project could affect groundwater recharge if more impervious land surfaces are created such that substantial infiltration of rain and runoff is prevented. No new groundwater wells would be created as part of the SUMC Project and no groundwater use during SUMC Project operation is anticipated; water supplies are provided by the City of Palo Alto and consist of surface water resources (see Section 3.14, Utilities, for more details).

Local Groundwater Table Levels. Underground parking structures would extend to four levels below grade (over 41 feet bgs). As noted in the Existing Conditions section, the design groundwater level for the Main SUMC Site is recommended to be 30 feet bgs. At the Hoover Pavilion Site, groundwater levels are estimated to be between 38 to 53 feet bgs. As mentioned in Section 3.10, Geology, Soils, and Seismicity, foundation drains are not recommended for

101 'Land surface' refers to the footprint area of structures and landscaping. While green roofs would be considered a pervious surface for runoff reduction, green roofs would not be available for groundwater recharge as would pervious land surfaces.

102 EIP Associates. City of Palo Alto/Stanford Development Agreement and Lease EIR. Figure 3.12-2: Watersheds and Ground Recharge Areas. March 2005.

103 Loren F. Metzger. *Streamflow Gains and Losses along San Francisquito Creek and Characterization of Surface-Water and Ground-Water Quality, Southern San Mateo and Northern Santa Clara Counties, California, 1996-1997.* US Geological Survey Water-Resources Investigation Report 02-4078. 2002. p. 11.

104 Santa Clara Valley Water District. *Santa Clara Valley Groundwater Subbasins* GIS data. December 15, 2003. available for download at: http://arcview.valleywater.org/download/index.asp

deep structures. Additionally, the Public Works Department would not allow a perforated pipe drainage system to be installed behind the below-grade parking structure walls or under the slabs. Instead, implementation of underground parking structures and other deep foundations would require flood proofing where they may extend below the groundwater table or design groundwater depth. Therefore, groundwater dewatering during the operation phase would not occur and operation of the SUMC Project would have no direct impact on the local groundwater table.

Groundwater Recharge. As explained above, the SUMC Sites are not in a significant groundwater recharge area and a confining layer separates the surface water table groundwater from the deep groundwater aquifer in the vicinity. The existing SUMC Sites consist of about 27 percent pervious land surfaces available for groundwater recharge and buildout would result in about 26 percent pervious land surfaces available for recharge, or about one percent less pervious land surfaces with implementation of the SUMC Project. Therefore, the SUMC Project overall would not substantially increase the amount of impervious land surfaces that could impede groundwater recharge after construction. It follows then that there would be a less-than-significant impact from operation of the SUMC Project on groundwater recharge.

HW-3. Groundwater Quality. The SUMC Project could have a significant impact on groundwater quality during construction. (S)

During construction, impervious surfaces (e.g., parking lots and buildings) would be removed and pervious surfaces exposed to rainfall and runoff waters. Without controls, infiltrating rainfall could pick up existing pollutants in the underlying soils or pollutants associated with construction activities (e.g., spills and leaks) and carry these materials to the local groundwater table. As mentioned in the Existing Conditions subsection, soils at the SUMC Sites are not highly permeable and there is a confining layer between the upper (perched) water table and the lower groundwater aquifer underlying the SUMC Sites.

Prior to the beginning of construction activities, a stormwater pollution prevention plan (SWPPP) is required per Municipal Code Section 16.09.117 and the Construction General Permit. The SWPPP includes requirements for: describing spill controls and waste management; storing materials and equipment to ensure that spills or leaks do not enter the storm drain system or surface waters; implementation of approved local plans; prohibiting certain construction practices that might cause or contribute to polluted runoff; implementing equipment maintenance schedules and procedures to minimize pollutants from leaks and equipment wear; and other non-stormwater management controls. Dischargers are required to inspect their construction sites before and after storms to identify stormwater discharge associated with construction activity and to identify and implement controls where necessary. These BMPs and other practices are designed to minimize stormwater contact with and transport of potential pollutants to water resources, including groundwater. Additionally, Section 16.09.117 requires a spill response plan for hazardous waste and materials and uncontained construction materials during construction activities; a stormwater pollution prevention plan; and prior approval for any discharge of pumped water. Prevention and clean up of spills during construction would protect groundwater quality by limiting the potential for infiltrating rainfall and stormwater runoff from picking up spilled pollutants and carrying them to groundwater through the exposed soils. Implementation of these regulatory requirements would generally reduce most construction pollutants' impacts on groundwater quality to non-substantial levels.

However, in the limited areas on the SUMC Sites where soil contamination has occurred (at 701 and 703 Welch Road and at the Hoover Pavilion site), if contaminated soils remained on the SUMC Sites during construction, exposure of those soils to rainfall runoff or runon and subsequent infiltration could contribute to migration of these pollutants to groundwater. However, as discussed in Section 3.12, Hazardous Materials, the SUMC Project sponsors intend to remove all contaminated soil from these sites prior to SUMC Project construction.

The Hoover Pavilion Site also has a history of groundwater contamination from diesel fuel, but recent testing shows the contamination is below regulatory thresholds and Stanford University has requested a closure agreement from County DEH. (See Section 3.12, Hazardous Materials.) Under the proposed agreement, there would be no requirement to prevent rainfall from infiltrating on the site. Accordingly, impacts on groundwater quality from rainfall runoff or runon would be less than significant.

The presence of polluted soil or groundwater underlying the majority of the Main SUMC Site is not expected, but the potential for contaminated areas from historic uses still exists. The Phase 1 reports summarized in Section 3.12, Hazardous Materials, indicate no evidence of hazardous materials accidents or spills at the Main SUMC Site locations evaluated. However, these Phase 1 reports are limited in scope and do not address the entire Main SUMC Site; therefore, the potential for exposure and transport of historic soil pollutants by infiltrating rainfall or runoff is still a concern for the Main SUMC Site and impacts on groundwater quality could be significant.

MITIGATION MEASURE. Mitigation Measure HW-3.1, below, would reduce the SUMC Project's impact on groundwater quality to a less-than-significant level. (LTS)

HW-3.1 *Develop a Work Plan for any Unknown Contaminated Sites.* During construction, if suspected contaminated soil, undocumented underground tanks, hazardous materials pipelines, or other evidence of potential hazardous materials are discovered, construction activities shall cease and the SUMC Project sponsors shall prepare a workplan to determine the potential risk to human and ecological health. The workplan shall be prepared by a Registered Environmental Assessor and in compliance with the Department of Toxic Substances Control (DTSC) guidelines and the National Oil and Hazardous Substances Contingency Plan (the "National Contingency Plan" [NCP]).

The SUMC Project sponsors, or their representative, shall be responsible for submitting the workplan for the DTSC's review and approval prior to implementing field activities. The workplan must include all information necessary for implementing field work. The workplan shall include a Site Safety Plan (SSP) and a Sampling Work Plan (SWP). The SSP must be submitted to the DTSC in conjunction with the submittal of the SWP. The objective of the SSP is to ensure protection of the investigative team as well as the general public during sampling activities.

If risk to human or ecological health is identified, the SUMC Project sponsors shall prepare and implement a Removal Action Workplan (SB 1706 Stats. 1994, Chapter 441) (non-emergency removal action or remedial action at a hazardous substance release site which is projected to cost less than $1,000,000) that is consistent with the NCP.

HW-4. Stormwater Runoff and Erosion. The SUMC Project would have a less-than-significant impact on stormwater runoff and erosion. (LTS)

Construction. The SUMC Project would include construction activities such as excavation and trenching for foundations, underground garages, and utilities; soil compaction and site grading; and demolition of structures and surface parking, all of which would temporarily disturb soils and alter the SUMC Sites drainage patterns. Disturbed soils are susceptible to high rates of erosion from wind and rain, resulting in potential sediment transport from the construction site.

On-Site Erosion. Exposure of previously covered soils during building and parking lot demolition, road work and realignment, and utility excavation could lead to increased on-site erosion and off-site sediment transport. Much of the exposed surfaces during construction of the SUMC Project would be below-grade, and therefore, would not be susceptible to off-site sediment transport. Additionally, the RWQCB, City of Palo Alto Municipal Code (Chapter 16.28), Construction General Permit, and City of Palo Alto URMP require erosion and sediment controls for construction projects with more than one acre of land disturbance. These requirements include preparation of a SWPPP, with both construction and permanent erosion and sediment controls.

The SWPPP includes a description of the construction erosion and sediment controls and control of post-construction sediment and erosion control measures and maintenance responsibilities to be implemented. Typical SWPPP construction BMPs include, but are not necessarily limited to: scheduling or limiting activities to certain times of year in order to minimize the potential for disturbed surfaces to be exposed to rainfall erosion during the wet season or wind erosion during the dry season; prohibiting certain construction practices that might contribute to off-site sediment transport; implementing a monitoring program to ensure that sediments do not leave the construction site; implementing other management practices to prevent or reduce pollution, such as using temporary mulching, seeding, or other suitable stabilization measures to protect uncovered soils; installing traps, filters, or other devices at drop inlets to prevent contaminants, including sediment, from entering storm drains; and using barriers, such as straw bales or plastic, to minimize the amount of uncontrolled runoff that could enter drains or surface water. Dischargers are required to inspect their construction sites before and after storms to identify stormwater discharge associated with construction activity and to identify and implement controls where necessary.

The new Construction General Permit requires certain minimum BMPs be included in the SWPPP and implemented. Because San Francisquito Creek is listed (303(d)) as impaired by sediment, the SUMC Project would be automatically a Risk Level of 2 or 3 project, depending upon the SUMC Sites' erosion potential. As such, in addition to the minimum specific required BMPs, construction activities would be subject to NALs or NELs for turbidity and pH, require effluent monitoring for turbidity and pH, and preparation and implementation of a Rain Event Action Plan to minimize potential off-site discharges of sediment.

The City's erosion and sediment control ordinance is contained in Municipal Code Chapter 16.28. All land-disturbing or land-filling activities or soil storage must be undertaken in a manner designed to minimize surface runoff, erosion, and sedimentation. An interim erosion and sediment control plan and SWPPP are required and must contain descriptions of surface runoff and erosion control measures to be implemented.

Additionally, the City of Palo Alto URMP includes performance standards for meeting requirements of the Municipal NPDES Permit. These include:

- For development of projects with significant erosion potential and planned construction activity during the wet season, the City of Palo Alto ensures, through a construction inspection program, that erosion and/or sediment control measures are implemented in accordance with local ordinances and project conditions of approval and maintained as needed during construction.
- The City of Palo Alto inspects construction sites for adequacy of stormwater quality control measures at least once per month for active sites, or more frequently based on the size of the project, site conditions, precipitation, and the project's potential impact on stormwater quality. All construction sites greater than one acre are inspected at least once before, during, and after construction.
- Prior to the beginning of the wet season each year, the City of Palo Alto inspects all sites requiring erosion and/or sediment control plans to ensure that measures have been taken to minimize erosion and discharges of sediment from disturbed areas.
- The City shall require developers of projects that disturb more than one acre of land area to demonstrate coverage under the Construction General Permit (C.3.a.iii.).
- The City shall require developers of projects with potential for significant erosion and planned construction activities during the wet season (October 1 through April 15) to prepare and implement an effective erosion and/or sediment control plan by the start of the wet season (C.3.a.iv.).
- Enforcement, training, and outreach provisions.

Standard operating procedures in the URMP include Architectural Review for stormwater controls, and Building Permit review during which Public Works staff impose conditions of approval related to grading and drainage issues (including construction stage and permanent stormwater controls), and a standard maintenance agreement to be signed by the owners of Group 1 projects[105] to ensure long-term operations and maintenance of permanent stormwater controls.

The SUMC Project would have to comply with these existing regulations and implementation of these requirements would prevent substantial on-site erosion by requiring erosion and sediment controls. Construction site inspection by the City, as required by the UWMP, would ensure that appropriate erosion and sediment control BMPs are implemented and functioning. Therefore, potential changes in drainage patterns and stormwater runoff at the SUMC Sites during construction would have a less-than-significant impact related to on-site erosion.

Off-Site Erosion. Off-site erosion and sedimentation could occur if stormwater runoff was conveyed over off-site unstabilized soil surfaces or to a susceptible creek or channel where higher erosive forces associated with increased flow rates could contribute to off-site erosion, including stream bed and bank erosion. All stormwater from the SUMC Site is conveyed through a local or City-owned storm drainage system and discharged into San Francisquito Creek; stormwater runoff would not be expected to flow over unstabilized, off-site soil surfaces. Therefore, there would be no impact related to increased stormwater runoff over off-site unstabilized soil surfaces.

Operation. Similar to construction, operation of the SUMC Project could cause or contribute to stormwater runoff and erosion if disturbed surfaces are not stabilized and if changes in drainage patterns result in more runoff that could affect San Francisquito Creek stream bed and bank erosion.

On-Site Erosion. The SUMC Project would be required to meet: the City of Palo Alto Municipal Code Chapter 16.11 (Stormwater Pollution) and Chapter 16.28 (Erosion and Sediment Control); the Construction General Permit (SWPPP); and the RWQCB's revised provision C.3 for storm water regulations that apply to land development projects that create or replace 10,000 square feet of impervious surface. These regulations would require that the SUMC Project incorporate a set of permanent site design measures, source controls, and treatment controls that serve to protect storm water quality, including permanent erosion and sediment transport controls. The SUMC Project sponsors would be required to calculate, develop, and incorporate permanent stormwater pollution prevention measures (preferably

105 As defined previously, Group 1 projects include Significant Redevelopment projects. The SUMC Project is a Significant Redevelopment project because it would result in addition or replacement which combined total 43,560 square feet or more of impervious surface on such an already developed site, and as such, is a Group 1 project. Other Group 1 projects include commercial, industrial, or residential developments that create one acre (43,560 square feet) or more of impervious surface, including roof area, sidewalks, and streets, roads, highways, and freeways that are under the Dischargers' jurisdiction and that create one acre (43,560 square feet) or more of new impervious surface.

landscape-based treatment controls such as bioswales, filter strips, and permeable pavers rather than mechanical measures that require long-term maintenance) to treat a specified percentage of site runoff. The SUMC Project sponsors must designate a party to maintain the control measures for the life of the improvements and must enter into a maintenance agreement with the City. The maintenance agreement must be in the form of a covenant running with the land. The agreement must provide access to the extent allowable by law for representatives or agents of the City for the purposes of verification of proper operation and maintenance of specific C.3 measures. Additionally, in accordance with the City's erosion and sediment control ordinance (Municipal Code Chapter 16.28), the final erosion and sediment control plan and SWPPP must include a description of permanent control measures to improve the quality of stormwater runoff from the sites. These existing regulatory requirements would serve to minimize the potential for erosion and sediment transport from the SUMC Project by stabilizing disturbed surfaces and by implementing stormwater quality BMPs to prevent sediment transport.

The SUMC Project would also be subject to the Regional Municipal Permit conditions, including implementation of LID practices (Provision C.3.c). LID is a stormwater management strategy that emphasizes conservation and the use of onsite natural features integrated with engineered, small-scale treatment and hydrologic controls to more closely reflect predevelopment conditions, and minimize the need for large sub-regional and regional treatment control measures. Implementation of Provision C.3.c. would further reduce potential erosion and sediment transport. Therefore, the SUMC Project impacts on on-site erosion would be less than significant.

Off-Site Erosion. Off-site erosion and sedimentation could occur if stormwater runoff were conveyed over off-site unstabilized soil surfaces or to a susceptible creek or channel where higher erosive forces associated with increased flow rates could contribute to off-site erosion, including stream bed and bank erosion. Surface runoff from the SUMC Site during operation of the SUMC Project would continue to be collected in a local stormwater drain system and the City of Palo Alto stormwater drain system that discharges to San Francisquito Creek. As such, the on-site stormwater drain system would not be substantially altered with implementation of the SUMC Project and the off-site stormwater drain system would not be altered. Therefore, there would be no impact related to increased stormwater runoff over off-site unstabilized soil surfaces.

The SUMC Site surface is currently about 27 percent pervious land surfaces with about 3 percent of green roofs. Implementation of the SUMC Project would replace existing buildings and surface parking lots with new buildings, underground parking, and a new parking structure, and ultimately create about 26 percent pervious land surfaces and about 11 percent of green roofs.[106] Green roofs can detain 60 to 100 percent of precipitation, depending upon the

[106] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 4, Figure 4-8b.

substrate and size of storm event.[107] The increased amount of pervious surfaces (land surface plus green roof area; a 7 percent total increase in pervious surfaces) would reduce the amount of stormwater runoff from the SUMC Project compared to existing conditions. Because there would be no net-increase in directly-connected impervious surfaces and the SUMC Sites are within an area designated as exempt from HM controls on the County HM map, the SUMC Project would be exempt from the HM stormwater controls requirements; a no-net-increase-in-directly-connected-impervious-area condition is considered to be sufficient to determine that there would be no increase in runoff rates, volume, or flow duration (maintenance of the pre-existing hydrograph) for the small (less than two-year) to medium (10-year) storm events. Because the pre-development hydrograph would be maintained, post-construction conditions under the SUMC Project would not substantially increase off-site bed or bank erosion or sedimentation in San Francisquito Creek.

The Public Works Department requires that the applicant's engineer provide storm drain flow and detention calculations, including pre-project and post-project conditions. The calculations must be signed and stamped by a registered civil engineer. The applicant may be required by the Public Works Department to provide stormwater detention on-site to lessen the SUMC Project's impact on City storm drains. Additionally, a Grading and Excavation Permit would be required for the SUMC Project. The SUMC Project plans must include a final grading and drainage plans prepared by a licensed professional. This plan must show the existing and proposed spot elevations or contours of the site and demonstrate the proper conveyance of storm water to the nearest adequate municipal storm drainage system. Existing drainage patterns, including accommodation of runoff from adjacent properties, must be maintained. Downspouts and site drainage features must be shown on this plan. Furthermore, the Public Works Department encourages the developer to keep stormwater on site, as much as feasible, by directing runoff to landscaped and other pervious areas on the site. As such, it can be ensured that post-development runoff does not exceed existing conditions and there would be no impact on off-site bed or bank erosion in San Francisquito Creek.

HW-5. Flooding and Stormwater Conveyance Capacity. The SUMC Project would have a less-than-significant impact on flooding and stormwater conveyance capacity. (LTS)

Construction. During construction of the SUMC Project, there may be an increase in the runoff rate for small to medium sized storm events (less than 2-year through 10-year storm event) because of potential for increases in impervious surfaces during the brief period when the new SHC hospital building and FIM 1 are complete and the 1959 Hospital Building complex has not yet been demolished. However, as mentioned in the Existing Conditions section, increased imperviousness often has little effect on flows during extreme events (e.g., greater than the 10-year flood flow events) because, during these events, rainfall saturates even natural soils, rendering them effectively impervious. Additionally, the reach of San

[107] N.D. VanWoert, D. B. Rowe, J. A. Andresen, C. L. Rugh, R. T. Fernandez, and L. Xiao. 2005. *Green Roof Stormwater Retention: Effects of Roof Surface, Slope, and Media Depth*. J. Environ. Qual. 34:1036–1044. Available at: http://jeq.scijournals.org/cgi/reprint/34/3/1036.pdf

Francisquito Creek to which the SUMC Project discharges to is not impaired for flood flows and the 100-year flood event is contained entirely within its banks through this section. Furthermore, groundwater dewatering during the wet season (November through March), if necessary, would not be allowed and would therefore not cause or contribute to flooding or stormwater conveyance capacity exceedences. Therefore, construction impacts associated with the SUMC Project on flooding and stormwater conveyance would be less than significant.

Operation. The SUMC Project plans must include a final grading and drainage plan prepared by a licensed professional. This plan must show the existing and proposed spot elevations or contours of the site and demonstrate the proper conveyance of storm water to the nearest adequate municipal storm drainage system. Existing drainage patterns, including accommodation of runoff from adjacent properties, must be maintained. Downspouts and site drainage features must be shown on this plan. Furthermore, the Public Works Department encourages the developer to keep stormwater on site, as much as feasible, by directing runoff to landscaped and other pervious areas on the site. The SUMC Project would not substantially alter site topography or the local storm drain system. Consequently, operation of the SUMC Project would have no impact on flooding and stormwater conveyance capacity.

HW-6. Streambank Instability. The SUMC Project would have a less-than-significant impact on streambank instability. (LTS)

The SUMC Project could affect streambank instability if construction directly disturbs streambanks and/or riparian vegetation, or if construction or operation result in higher flow rates, volume, or duration of flows that could cause or contribute to stream bed or bank erosion. The SUMC Project would not involve any construction activities in or near the bank of the San Francisquito Creek that could directly impact streambank stability. As explained under Impact HW-4, the SUMC Project could, however, increase the amount, rate, or duration of runoff from the SUMC Sites at times during the 12-year construction period, but this condition would be temporary and brief and potential construction impacts would be less than significant. Following buildout, the SUMC Project would reduce the amount of directly-connected impervious area by about 7 percent. As such, operation of the SUMC Project would have no impact on streambank instability during operation.

HW-7. Degradation of Surface Water Quality. The SUMC Project would have a less-than-significant impact on degradation of surface water quality. (LTS)

Construction. The SUMC Project would include construction activities such as excavation and trenching for foundations and utilities, soil compaction, and site grading, all of which would temporarily disturb soils. Disturbed soils are susceptible to high rates of erosion from wind and rain, resulting in potential sediment transport from the construction site. Erosion and sedimentation affects water quality through interference with photosynthesis, oxygen exchange, and the respiration, growth, and reproduction of aquatic species. Additionally, other pollutants, such as nutrients, trace metals, and hydrocarbons, can attach to sediment and be transported downstream, which could contribute to the degradation of surface water quality.

Impact HW-4 addresses the potential effects of the SUMC Project on erosion and sediment transport and existing regulatory requirements that prevent substantial erosion and sediment transport. The potential for the SUMC Project to affect groundwater quality is addressed in Impact HW-3.

The delivery, handling, and storage of construction materials and wastes, as well as the use of construction equipment, could introduce a risk for stormwater contamination that could affect water quality during construction of the SUMC Project. Spills or leaks from heavy equipment and machinery can result in oil and grease contamination, and some hydrocarbon compound pollution associated with oil and grease can be toxic to aquatic organisms at low concentrations. Staging areas or building sites can be the source of pollution because of the use of paints, solvents, cleaning agents, and metals during construction. The effects associated with metals in stormwater include toxicity to aquatic organisms, such as bioaccumulation, and the potential contamination of drinking supplies. Pesticide use (including herbicides, fungicides, and rodenticides), often associated with site preparation work, is another potential source of stormwater contamination. Larger pollutants, such as trash, debris, and organic matter, are additional pollutants that could be associated with construction activities. Effects include health hazards and aquatic ecosystem damage associated with bacteria, viruses, and vectors.

Construction of the SUMC Project would be subject to existing regulations that include the City of Palo Alto Municipal Code (Title 16 – *Building Regulations*: Chapter 16.09 – *Sewer Use Ordinance*, Chapter 16.11 – *Stormwater Pollution Prevention*, and Chapter 16.28 - *Excavations, Grading and Fills*), the Construction General Permit, and the Municipal Regional Permit (City of Palo Alto URMP).

The Palo Alto Municipal Code, the URMP, and Construction General Permit require a SWPPP. The SWPPP must include specific BMPs that address source control, and specific BMPs that address specific erosion and sediment control. The SWPPP includes a description of: (1) the site; (2) erosion and sediment controls; (3) means of waste disposal; (4) implementation of approved local plans; (5) control of post-construction sediment and erosion control measures and maintenance responsibilities; and (6) non-stormwater management controls. Dischargers are required to inspect their construction sites before and after storms to identify stormwater discharge associated with construction activity and to identify and implement controls where necessary.

The SWPPP is designed to reduce the potential for pollutants in stormwater runoff to reach receiving waters. Typical construction BMPs include, but are not necessarily limited to: scheduling or limiting activities to certain times of year to minimize pollutants and soil exposure to stormwater runoff; prohibiting certain construction practices that could cause or contribute to pollutants in stormwater runoff (e.g., sediment tracking, destabilizing surfaces by disturbance of vegetation); implementing equipment maintenance schedules and procedures to reduce pollutants associated with equipment wear and leaks; implementing a monitoring program to ensure effective prevention of off-site transport and implementation of BMPs;

implementing other management practices to prevent or reduce pollution, such as using temporary mulching, seeding, or other suitable stabilization measures to protect uncovered soils; storing materials and equipment to ensure that spills or leaks do not enter the storm drain system or surface waters; developing and implementing a spill prevention and cleanup plan to quickly clean up pollutants if spills should occur; installing traps, filters, or other devices at drop inlets to prevent contaminants from entering storm drains; and using barriers, such as straw bales or plastic, to minimize the amount of uncontrolled runoff and associated pollutants that could enter storm drains or surface water.

As noted above, the SUMC Project would automatically be classified as a Risk Level 2 or 3 project, depending upon the SUMC Sites' erosion potential. Certain BMPs that were only required to be considered under the previous permit, but not necessarily implemented in the SWPPP, would now be required as part of the construction SWPPP. These would include BMPs for construction materials and waste management; vehicle storage and management; landscape materials; an assessment and creation of a list of potential pollutant sources; identification of any areas of the site where additional BMPs are necessary; measures to control all non-storm water discharges during construction; erosion and sediment controls; run on and runoff controls and inspection, maintenance, and repairs; a Rain Event Action Plan; and monitoring and reporting requirements.

Additionally, Chapter 16.09 of the Municipal Code requires a spill response plan for hazardous waste and materials and uncontained construction materials at construction sites, for all projects equal to or greater than one acre of disturbed soil, and prior approval for any discharge of pumped water. These existing regulations would serve to reduce the potential for pollutants in stormwater runoff and reduce discharges of pollutants to surface water and groundwater resources.

The URMP ensures that construction inspection occurs in a timely manner and Section 16.11.030 of the Municipal Code ensures that all construction plans are approved by the City Engineer. Additionally, standard operating procedures in the URMP include Architectural Review for stormwater controls, and Building Permit review during which Public Works staff impose conditions of approval related to grading and drainage issues (including construction phase and permanent stormwater controls). Consequently, the potential for pollutant introductions to stormwater and off-site transport to receiving waters during construction activities is minimized.

Degradation of water quality could occur if polluted groundwater from construction dewatering activities is discharged to surface waters or the storm drain system. If construction dewatering is required, the Public Works Department may require the water to be tested for contaminants prior to initial discharge and at intervals during dewatering. If testing is required, the contractor must retain an independent testing firm to test the discharge water for the contaminants specified by the Public Works Department and submit the results to the Public Works Department. The Public Works Department reviews and approves dewatering plans as part of a Permit for Construction in the Public Street ("street work permit"). Furthermore, any discharge of extracted groundwater would be subject to the Construction General Permit or individual WDR/NPDES permit conditions as determined by the RWQCB. Consequently, potential effects of groundwater dewatering discharges would not be substantial and would be temporary.

These existing regulations, along with the Municipal Regional Permit requirement for Construction Site Controls (including inspection and enforcement by the Permittees), would serve to protect surface water from potential pollutants associated with construction of the SUMC Project. In light of these regulations, potential construction impacts on surface water quality degradation would be less than significant.

Operation. The type of stormwater pollutants and their concentrations in runoff water vary with surrounding land uses, topography, and amount of impervious cover, as well as intensity and frequency of irrigation or rainfall. During the operational phase of the SUMC Project, the major source of pollution in stormwater runoff that could cause or contribute to surface water quality degradation would be contaminants that have accumulated on rooftops and other impervious surfaces, such as parking lots and pedestrian walkways. Rainfall washes the accumulated pollutants off surfaces and carries them through the local and City storm drain system to San Francisquito Creek. The type and amount of pollutants in stormwater runoff are therefore affected by both the amount of impervious surfaces and the type of land use that could generate pollutants. Operation of the SUMC Project could cause or contribute to surface water quality degradation if hazardous materials are discharged to the sanitary sewer system without adequate pretreatment.

Discharge to Sanitary Sewer System. Pollutants that could cause or contribute to water quality degradation through the sanitary sewer system are effectively controlled by existing regulations. As described previously, Stanford University has, in a written contract, agreed to comply with the Palo Alto Sewer Use Ordinance and the federal (EPA) Pretreatment Standards. Therefore, the same procedures are used for enforcement on the Stanford Campus as are used for industrial facilities in reducing pollutants in sanitary wastewater. Stanford University has a Hazardous Materials Management Plan to prevent environmental risk and exposure to hazardous materials used in health services and operations (see Section 3.12, Hazardous Materials, for more information). These existing regulations and requirements would prevent substantial introduction of hazardous pollutants to the sanitary sewer system. Impacts associated with discharges of hazardous materials to the sanitary sewer system would therefore be less than significant.

Stormwater Runoff. Pollutants associated with the operational phase of the SUMC Project would include nutrients, oil and grease, metals, organics, pesticides, and gross pollutants (including bacteria). Nutrients that may be present in post-construction stormwater include nitrogen and phosphorous resulting from fertilizers applied to landscaping, degradation of organic material (e.g., leaves on streets and sidewalks), and atmospheric deposition. Excess nutrients can impact water quality by promoting excessive and/or a rapid growth of aquatic vegetation, which reduces water clarity and results in oxygen depletion. Oil and grease can enter stormwater from vehicle leaks, traffic, and maintenance activities. Metals can collect on impervious surfaces through atmospheric deposition and machine (e.g., cars) wear, which are then washed off to the storm drain system during storm events. Metals can enter stormwater runoff if there is a direct interaction between bare metal surfaces and stormwater (e.g., bare metal roofs, gutters, downspouts, and other structures, if used). Pesticides can enter stormwater after application on landscaping areas of the SUMC Project and are often toxic to aquatic organisms; some pesticides can bioaccumulate in larger species such as birds and fish. However, several existing regulations and design conditions would limit the SUMC Project's potential effects on degradation of surface water quality. Additionally, the SUMC Project would not substantially alter the type of land use compared to existing conditions (except for adding green roofs) and therefore, the general type and amount of pollutants that can be expected in stormwater runoff.

The San Francisco Bay and San Francisquito Creek are currently listed as impaired by pesticides, sedimentation/siltation, certain heavy metals, and other constituents. Any additional contributions of these constituents to San Francisquito Creek or the San Francisco Bay could be considered significant. However, TMDLs have been developed for mercury and diazinon and are being developed for the rest of the pollutants by 2018. The SUMC Project would have to comply with any existing TMDLs, which would reduce potential impacts from these pollutants by preventing contributions from surface runoff or sewage disposal above allocated loads that are considered to not contribute to violations of water quality standards. Additionally, other existing regulations would reduce the potential for these pollutants in stormwater runoff from the SUMC Sites. The SUMC Project would be subject to Provision C.3 of the Municipal Regional Permit, the City of Palo Alto URMP, General Construction Permit (SWPPP), and City of Palo Alto Municipal Code, which require incorporation of permanent stormwater quality BMPs and LID requirements, to the maximum extent practicable. Specific minimum BMPs for source control and stormwater treatment are also required, as described under Applicable Plans and Regulations, Municipal Regional Permit. Stormwater quality BMPs would reduce the potential for introduction of pollutants in stormwater runoff, as well as treat stormwater runoff to remove pollutants.

Reducing the amount of impervious surface and providing detention/retention reduces the total amount of pollutants that can be carried to receiving waters in runoff because the total amount of runoff is reduced. As mentioned in the Existing Conditions section, in urban areas such as the City of Palo Alto, the stormwater pollution potential is most highly related to the amount of runoff.[108] Site design measures have been incorporated into the SUMC Project that would reduce the overall amount of impervious surfaces by about 7 percent and increase the amount of green roofs by about 6 acres (9 percent of the SUMC Sites), which would reduce the amount of runoff, and hence, stormwater pollution potential.

108 Santa Clara Basin Watershed Management Initiative. Watershed Management Plan: *Volume I Watershed Characteristics Report Unabridged 2003 Revision.* Chapter 4 Land Use in the Santa Clara Basin. p. 4-13. Available at www.valleywater.org/_wmi/related_report/wcr2003r.cfm.

Municipal Code Section 16.09.106 prohibits the discharge of any domestic, industrial, or hazardous waste into storm drains, gutters, creeks, or the San Francisco Bay and requires a spill response plan to clean up materials that may be deposited on surfaces exposed to rainfall and stormwater runoff. These requirements reduce the potential for direct discharge of waste and hazardous materials into the storm drain system and San Francisquito Creek. Furthermore, all refuse areas are required to be in covered areas designed to prevent water run-on to the area and runoff from the area, fuel dispensing area requirements, and loading dock drainage requirements. These practices prevent stormwater runoff contact with areas that are likely to contain pollutants and off-site transport of polluted runoff water. Limiting the amount of pollutants generated, discharged, and susceptible to contact with stormwater runoff reduces the amount of pollutants that can be transported to receiving waters and cause or contribute to water quality degradation.

City of Palo Alto Municipal Code Section 16.11.030 requires permanent stormwater pollution prevention measures that reduce the water quality impacts of stormwater runoff from the entire site for the life of the project. Because the SUMC Project is a Significant Redevelopment project that is expected to replace more than 50 percent of the impervious surfaces of a previously existing development, and the existing development was not subject to stormwater treatment measures, the entire SUMC Project must be included in the treatment measure design, not just the redeveloped areas. Consequently, not only would runoff from the redeveloped areas be treated to reduce the amount of pollutants in stormwater runoff, but runoff from the rest of the SUMC Sites would be treated. This would result in a lower potential for water quality degradation from the SUMC Project compared to existing conditions. Furthermore, stormwater treatment measures proposed as part of a project's permanent stormwater pollution prevention measures must be designed in accordance with the hydraulic sizing criteria detailed in Municipal Code Section 16.11.030. This ensures that such devices are designed to adequately treat stormwater runoff and to sufficiently remove pollutants from stormwater runoff.

All plans and construction are subject to inspection and approval by the City Engineer, which ensures that selected BMPs are adequate for the expected pollutants in stormwater runoff from the SUMC Sites. Architectural Review and Building Permit review and conditions of approval ensure that the SUMC Project incorporates sufficient stormwater quality BMPs. Furthermore, because no final building or occupancy permit shall be issued without the written certification of the City Engineer that the requirements of Chapter 16.11 have been satisfied, planned BMPs would be effectively implemented.

Long-term operations and maintenance of BMPs is required by the URMP and Municipal Code (Section 16.11.040). As a condition of approval, the City Engineer may require the owner of a development project or significant redevelopment project to establish a self-monitoring and reporting program to ensure all permanent stormwater pollution prevention measures are in compliance with the provisions of Chapter 16.11 (Section 16.11.050). Therefore, the long-term effectiveness of implemented BMPs is ensured.

The SUMC Project would not substantially change the type of land use or surface topography and would not increase the amount of impervious cover. Therefore, the type and concentration of pollutants in stormwater would not be substantially different from existing conditions, without controls. Regardless, existing regulations would still require stormwater quality BMPs to prevent pollutant introduction to stormwater and to treat polluted stormwater from the SUMC Sites. Also, as described in Impact HW-4, post-construction conditions under the SUMC Project would not increase the amount of stormwater runoff because it would increase the amount of pervious land surface area by 7 percent and add 6 more acres (9 percent of the SUMC Sites) of green roofs. Therefore, SUMC Project characteristics and existing regulatory requirements would ensure that impacts of the SUMC Project on stormwater degradation of surface water quality would be less than significant.

HW-8. Dam Failure Inundation. The SUMC Project would have a less-than-significant impact regarding dam failure inundation. (LTS)

The SUMC Sites are not in an area subject to risk of a 100-year storm event flood or levee failure; however, it is in a dam inundation area in the event of failure of the Searsville Dam. Existing conditions include the same land uses as proposed and already expose people and property to risk from a dam failure. The SUMC Project would, however, increase the number of people with potential exposure to dam inundation because it would increase the on-site floor area and number of patients, employees, and patient visitors at the SUMC Sites.

The Comprehensive Plan includes an emergency management policy to minimize exposure to all hazards through emergency management planning (Policy N-55). The City of Palo Alto conducts emergency preparedness on an on-going basis and includes specific provisions for pre-emergency planning and post-disaster recovery. The City of Palo Alto has an Emergency Plan to inform and protect citizens against emergencies such as dam failure inundation. Consequently, the risk to the SUMC Project from dam failure inundation would be less than significant.

HW-9. Violation of Any Water Quality Standards or Waste Discharge Requirements (WDRs). The SUMC Project would have a less-than-significant impact regarding water quality standards or WDRs. (LTS)

Applicable WDRs include the Municipal Regional Permit, the Construction General Permit, and any individual WDR or NPDES permit associated with construction dewatering (if required). If construction dewatering is minimal, discharges may be covered under the Construction General Permit. If substantial construction dewatering is required, the SUMC Project sponsor would be required to file a Report of Waste Discharge and obtain a WDR permit or waiver of a WDR from the RWQCB, if dewatering water would be disposed of on the land surface. If construction dewatering would discharge directly to San Francisquito Creek or the storm drain system (if permitted by the City of Palo Alto), an NPDES permit application would need to be filed and an NPDES permit would need to be obtained from the RWQCB. Applicable Water Quality Standards are listed in the Basin Plan.

The Municipal Regional Permit and Construction General Permit were prepared to implement requirements for protecting surface water and groundwater quality and to ensure that water quality standards are met. The City has incorporated certain requirements of the Municipal Regional Permit and Construction General Permit into the URMP and Municipal Code and enforces requirements through the permit review and approval processes. Additionally, the City ensures compliance with permit conditions through a construction inspection program, including a final inspection following construction for permanent stormwater quality and quantity (if necessary) controls. Furthermore, the City requires stormwater quality BMPs for the entire SUMC Site, not just the redeveloped areas because the SUMC Project would replace more than 50 percent of the existing impervious surfaces. Additionally, if construction dewatering is required, the City's Public Works Inspector is required to confirm that the dewatering system is installed per an approved Construction Dewatering Plan for discharge into the storm drain system. The Stormwater Investigator is required to confirm that BMP's are in place to ensure the quality of the water to be discharged. Consequently, these existing regulations and city requirements ensure that the SUMC Project would have a less than significant impact regarding violation of water quality standards or existing WDRs.

Cumulative Analysis

The context for the analysis of cumulative surface water quality and hydrology impacts is the San Francisquito Creek Watershed for surface water and the Santa Clara Subbasin for groundwater quality and hydrology impacts, including all cumulative growth therein. Those issues for which the SUMC Project would have no impact are not analyzed because the SUMC Project would have no potential to contribute to cumulative impacts. Cumulative development projects in the San Francisquito Creek Watershed and the Santa Clara Subbasin may result in cumulative effects on hydrology and water quality. For cumulative impacts on surface water, growth projections for jurisdictions within the San Francisquito Creek Watershed are applied and a list of reasonably foreseeable future projects within Palo Alto (see Appendix B of this EIR for the list of projects). The HST Project is also factored in. For cumulative impacts on groundwater, growth projections for jurisdictions in the Santa Clara Subbasin are applied and a list of projects in Palo Alto is factored in (Menlo Park is not in the Santa Clara Subbasin). The cumulative effects that could be significant are analyzed below, based on projections of 2025 cumulative growth compared to 2005 and 2010.[109]

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[109] Data for Mountain View, Los Altos Hills, Los Altos, Cupertino, Sunnyvale, Santa Clara, San Jose, Milpitas, Los Gatos, Monte Sereno, Morgan Hills, Saratoga, Campbell, and Palo Alto for the Santa Clara Subbasin and Palo Alto, East Palo Alto, Menlo Park, Woodside, and Portola Valley for the San Francisquito Creek watershed: Association of Bay Area Governments. Forecasts for the San Francisco Bay Area to the Year 2030: Projections 2005, Association of Bay Area Governments.

HW-10. Cumulative Groundwater Recharge and Local Water Table. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative considerable impact on groundwater recharge and the local groundwater table. (LTS)

Many of the developable areas within the Santa Clara Subbasin are already nearly built out.[110]

Direct Effects. As mentioned in the Existing Conditions discussion, excessive reliance on groundwater for water supply uses in the past has resulted in lowering of the groundwater table and subsequent land subsidence. The SCVWD now manages groundwater and surface water supplies to protect groundwater resources and to maximize water supply reliability. More than half of the SCVWD water supplies are surface water sources. Use of groundwater in the Santa Clara Subbasin is currently off-set by the SCVWD through artificial recharge in addition to natural recharge. Therefore, future growth and potential direct cumulative impacts on groundwater levels would be less than significant.

Recharge Potential. As discussed under Existing Conditions, natural recharge occurs principally as infiltration from streambeds and direct percolation of precipitation that falls on the basin floor in areas with high recharge potential. Consequently, changes in overlying land surface hydrology could alter groundwater recharge rates by increasing the amount of impervious surface cover or by increasing stormwater runoff so that rainfall does not percolate to groundwater. Natural groundwater recharge from direct precipitation can occur in the unconfined groundwater subbasin region.[111] None of the listed near-term projects within the City of Palo Alto, or the HST project, are located over the unconfined Santa Clara Subbasin; no foreseeable planned development is located within a high groundwater recharge area. Comparison of the unconfined aquifer regions with HMP buildout map[112] indicates that the potential recharge areas of the Santa Clara Subbasin are already primarily 90 percent built out. However, some areas within the potential groundwater recharge regions are still not built out and future development could increase impervious surfaces within the area with a subsequent loss in groundwater recharge potential.

The SCVWD Capital Improvement Plan includes projects for increasing groundwater recharge potential, water conservation, and water reuse to ensure adequate water supplies without diminishing resources.[113]

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110 Santa Clara Valley Urban Runoff Pollution Prevention Program. 2006. Hydromodification Management Plan. Available at: http://www.scvurppp-w2k.com/hmp_maps.htm, Santa Clara County.

111 Santa Clara Valley Water District. *Santa Clara Valley Groundwater Subbasins* GIS data. December 15, 2003. available for download at: http://arcview.valleywater.org/download/index.asp.

112 Santa Clara Valley Water District. Hydromodification Management Plan Final Report 5. *Hydromodification Control Standard and Performance Criteria*. April 21, 2005. p. 5-12.

113 Santa Clara Valley Water District. 2007/2008 Capital Improvement Program. Available at: http://www.valleywater.org/Water/_Capital_Improvement_Program/2007-2008_program/index.shtm.

Management of groundwater resources by the SCVWD would continue to serve to protect groundwater resources, incorporate artificial recharge to offset groundwater losses, and maximize water supply reliability within the subbasin. Additionally, the Municipal Regional Permit requires HM stormwater controls, such as infiltration or detention, for areas where increased runoff from creation of more impervious surfaces would potentially degrade stream channels. Furthermore, future development would undergo the environmental review process that would determine if potential effects on groundwater recharge would be substantial and identify mitigation measures to minimize impacts, where necessary. Therefore, it is unlikely that there would be a cumulative substantial modification in the amount of runoff and hence, a decrease in groundwater recharge potential. Consequently, potential cumulative impacts on groundwater recharge would be less than significant.

HW-11. Cumulative Groundwater Quality Impacts. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative impact on groundwater quality. (LTS)

Groundwater quality within the Santa Clara Basin is considered to be very good (see the Existing Setting of this section). Therefore, although this is an important water resource, it is not already degraded or in imminent risk of substantial degradation.

Most of the Santa Clara Subbasin is a confined aquifer,[114] which would limit the potential for infiltrating pollutants to reach the underlying groundwater supply aquifer. Undeveloped areas of the Santa Clara Subbasin would not be expected to have contaminated soils or groundwater that could cause or contribute to degradation of groundwater quality during construction of future development. Redevelopment of existing developed areas over the confined aquifer could expose contaminated soils to rainfall runoff and infiltration; however, potential migration of pollutants to groundwater would be impeded by the confining layers. Redevelopment in potential groundwater recharge areas may expose contaminated soils and groundwater to precipitation and runoff that could contribute to migration of pollutants into the shallow groundwater, as described for the SUMC Project. Only one listed future project, 3401 Hillview, is potentially located above the unconfined aquifer zone and all significant redevelopment would be subject to the environmental review process to identify project-specific risks and mitigation, if necessary, to groundwater quality and contaminated groundwater migration. Additionally, the existing Santa Clara Valley Urban Runoff Pollution Prevention Program, Municipal Regional Permit, local codes and regulations, limitations on infiltration BMPs where groundwater would be susceptible to contamination, and implementation of construction BMPs (SWPPP) would reduce the potential for spill and hazardous material contamination of groundwater resources and mitigation of contaminated soils during construction activities. Consequently, future development in the Santa Clara Subbasin would be protected from contamination, would not expose contaminated soils or groundwater to

[114] Santa Clara Valley Water District. *Santa Clara Valley Groundwater Subbasins* GIS data. December 15, 2003. Available for download at: http://arcview.valleywater.org/download/index.asp.

infiltrating or runoff waters and would therefore not substantially degrade groundwater quality. As such, cumulative impacts on groundwater quality would be less than significant.

HW-12. Cumulative Stormwater Runoff and Erosion. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative impact on stormwater runoff and erosion. (LTS)

Population growth within the San Francisquito Creek Watershed is expected to increase by about 8.5 to 12.6 percent. The largest changes are expected to occur within the City of Palo Alto, although 2 to 3 percent of population growth would occur in the less developed Woodside and Portola Valley. Population, household, and job growth would likely result in a combination of infill, redevelopment, and new development within the watershed; however, many of the developable areas within the watershed are already nearly built out.[115]

All of the near-term projects in cities of Menlo Park and Palo Alto are located within areas requiring HM controls or in areas where hydrograph modification would not contribute to stream bed or bank erosion (HM control exempt areas).[116] Reasonably foreseeable probable future planned development would primarily result in replacement of existing land uses with similar land uses. However, some vacant parcels are planned for development of residential, recreation, institutional, and retail land uses. The majority of foreseeable development within the City of Palo Alto and along El Camino Real in Menlo Park would occur in areas that are already 90 percent built out.[117] Additionally, the HST project is located in an HM control exempt areas because it is in catchments draining to hardened channels and/or tidal areas or catchments and subwatersheds greater than or equal to 65 percent impervious surfaces, and as such, development within these areas would have little effect on off-site channel erosion.[118]

Stormwater runoff and erosion within the San Francisquito Creek watershed are subject to existing regulatory requirements (Municipal Regional Permit, Construction General Permit, as well as local municipal codes), which include both construction phase and permanent erosion and sediment controls that prevent substantial erosion and sediment transport from development within the San Francisquito Creek watershed. Additionally, all of the jurisdictions in the San Francisquito watershed regulate activities that can cause erosion and sedimentation through their municipal codes. The stormwater ordinances adopted by all of the stakeholders ensure

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[115] Santa Clara Valley Urban Runoff Pollution Prevention Program. 2006. Hydromodification Management Plan. Available at: http://www.scvurppp-w2k.com/hmp_maps.htm.

[116] Santa Clara Valley Urban Runoff Pollution Prevention Program. 2006. Classification of Subwatershed and Catchment Areas for Determining Applicability of HMP Requirements. Available at: http://www.scvurppp-w2k.com/hmp_maps.htm, Santa Clara County.

[117] Santa Clara Valley Urban Runoff Pollution Prevention Program. 2006. Classification of Subwatershed and Catchment Areas for Determining Applicability of HMP Requirements. Available at: http://www.scvurppp-w2k.com/hmp_maps.htm, Santa Clara County.

[118] California Regional Water Quality Control Board San Francisco Bay Region. 2009. Municipal Regional Stormwater NPDES Permit Order R2-2009-0074 NPDES Permit No. CAS612008, Attachment E Provision C.3.g. San Mateo Permittees Hydromodification Management Requirements and Attachment F Provision C.3.g. Santa Clara Permittees Hydromodification Management Requirements. Adopted October 14, 2009.

legal authority to control erosion and sediment transport. Furthermore, new development and redevelopment within the watershed would be subject HM controls in accordance with the Municipal Regional Permit.[119] These existing regulations require stormwater controls where post-development site runoff may contribute to increased stream bed or bank erosion by increasing the amount of impervious surfaces or otherwise increasing the rate, volume, or duration of stormwater runoff to an erosion-susceptible creek or channel. Additionally, most cumulative development would not likely occur over such a long time frame that substantial interim changes in impervious surfaces would be present. Consequently, potential cumulative stormwater runoff and erosion impacts would be less than significant.

HW-13. Cumulative Flooding and Stormwater Conveyance. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative impact on stormwater runoff and erosion. (LTS)

Continued growth and development within the San Francisquito Creek Watershed could increase the amount of impervious areas. However, as discussed earlier, most of the foreseeable projects within the cities of Menlo Park and the City of Palo Alto are primarily infill and re-development and would not substantially alter the amount of impervious surfaces within the watershed. As discussed under Impact HW-12, if the amount of impervious surfaces is increased, stormwater runoff controls would be required to ensure that runoff does not exceed existing rates for less than two-year through 10-year storm event for areas subject to HM controls. Other areas are already mostly impervious surfaces and redevelopment would not substantially alter the amount of impervious surface cover and hence, stormwater runoff. Furthermore, as discussed under Impact HW-5, increased imperviousness in urban areas often has little effect on flows during extreme events (e.g., 100-year flood flow events) because during these events, rainfall saturates even natural soils, rendering them effectively impervious. Therefore, potential effects of cumulative development and growth in the San Francisquito Creek on flooding and stormwater conveyance would be less than significant.

HW-14. Streambank Instability. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative impact on streambank instability. (LTS)

As discussed under Impact HW-12, new development and redevelopment within the watershed would be subject to either the San Mateo or Santa Clara Permittees' Hydromodification Management Requirements in accordance with the Municipal Regional Permit. These Permittees require stormwater HM controls where post-development site runoff may contribute to increased stream bed or bank erosion (streambank instability). The San Mateo or Santa Clara Permittees' HM control requirements are very similar regarding erosion, flow, and

[119] California Regional Water Quality Control Board San Francisco Bay Region. 2009. Municipal Regional Stormwater NPDES Permit Order R2-2009-0074 NPDES Permit No. CAS612008, Attachment E Provision C.3.g. San Mateo Permittees Hydromodification Management Requirements and Attachment F Provision C.3.g. Santa Clara Permittees Hydromodification Management Requirements. Adopted October 14, 2009.

sediment BMPs for significant new and redevelopment. As mentioned above, all foreseeable development in the City of Menlo Park and the City of Palo Alto, including the HST project, would occur within areas subject to HM controls or be located in watersheds that are exempt from requiring HM controls, and therefore, are not subject to stream bed or bank erosion from development or redevelopment.

Additionally, the San Francisquito Creek Watershed Council coordinates stewardship of the San Francisquito Creek and its surrounding land to restore habitat, monitor water quality and observe creek trends, raise awareness about the watershed, and provide policy support for local governments to keep the creek healthy and safe. Representatives from public agencies, local governments, community organizations, and individual citizens make up the Steering Committee. This oversight of San Francisquito Creek and coordination with stakeholders and policy makers further serve to protect and/or restore San Francisquito Creek from potential hydrograph modification impacts, as well as other impacts to its form and/or function.

In order to address community concerns regarding flooding and environmental preservation on San Francisquito Creek, the City has worked with neighboring jurisdictions to create the San Francisquito Creek Joint Powers Authority (JPA), an agency empowered to protect and maintain the 14-mile San Francisquito Creek and its 45 square-mile watershed. The JPA was created through the adoption of a joint powers agreement by the member agencies in order to:

- To facilitate and perform bank stabilization, channel clearing, and other creek maintenance;
- To plan flood control measures for the San Francisquito Creek watershed;
- To take actions necessary to preserve and enhance environmental values and instream uses of San Francisquito Creek; and
- To coordinate emergency mitigation and response activities relating to San Francisquito Creek.

Nearly all of the jurisdictions within the San Francisquito Creek Watershed have strong policies calling for the protection of natural resources, including trees, riparian corridors, and watercourses. The general plans of Portola Valley and Woodside list preservation of the natural beauty and landforms as primary goals. Both towns' design guidelines also stress the protection of drainage swales, streams, slopes, trees and plant communities. Woodside, Palo Alto, Menlo Park, and Santa Clara County have adopted general plan policies to protect riparian corridors by creating buffers and the City of Woodside has implemented that policy in its zoning ordinance. Portola Valley has created a Creekside Corridor Committee to study recommendations for establishing regulations and policies along creeks. Menlo Park also is planning to revise its Grading and Drainage Site and Design Guidelines or standard Conditions of Approval to promote the benefits of buffer zones and creek setbacks and restrict or prohibit structures and impervious surface within a specified distance from the top of the creek bank.

In Santa Clara County, the SCVWD has authority to regulate certain activities near streams. On October 24, 2006, the SCVWD adopted a new Water Resources Protection Ordinance that governs and requires permits for activities that encroach on District land or facilities. The County and local municipalities continue to exercise their own land use authority and incorporate review of streamside activities into their existing land development approval and permitting processes.

Consequently, compliance with existing regulations and requirements would protect streambank stability and cumulative streambank instability impacts would be less than significant.

HW-15. Degradation of Surface Water Quality. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative impact on degradation of surface water quality. (LTS)

Please see the discussion for Impact HW-7. Future development within the watershed would include construction activities such as excavation and trenching for foundations and utilities, soil compaction and site grading, all of which would temporarily disturb soils. Disturbed soils and any associated pollutants are susceptible to high rates of erosion from wind and rain, resulting in potential sediment transport from the construction site. Additionally, the delivery, handling, and storage of construction materials and wastes, as well as the use of construction equipment, could also introduce a risk for stormwater contamination that could impact water quality. Following construction, the major source of pollution in stormwater runoff would be contaminants that have accumulated on rooftops and other impervious surfaces, such as parking lots and pedestrian walkways.

Construction activities and development within the watershed would be subject to existing regulations that include the SFB Basin Plan, Construction General Permit, the Municipal NPDES Permits (San Mateo County Water Pollution Prevention Program and Santa Clara Valley Urban Runoff Pollution Prevention Program), Municipal Regional Permit, and existing municipal codes. These existing regulations would serve to protect surface water from potential pollutants associated with construction and potential cumulative construction impacts on surface water quality would be less than significant.

The San Francisco Bay and San Francisquito Creek are listed as impaired by pesticides, sedimentation/siltation, certain heavy metals, and other constituents. Therefore, any additional contributions of these constituents to San Francisquito Creek or the San Francisco Bay could be deemed potentially significant. However, TMDLs have been developed for mercury and diazinon and are being developed for the rest of the pollutants by 2018. All projects within the watershed that discharge to the San Francisco Bay would have to comply with any existing TMDLs, which would reduce potential impacts from these pollutants. Furthermore, the impaired waters list is revisited every two years and updated as necessary. Continued monitoring and assessment serves to identify new impairments and evaluate the effectiveness of programs for protecting water quality.

Additionally, new or redevelopment projects within the San Francisquito Creek watershed would have to undergo the environmental review process and local permit application process and have to comply with the San Mateo County Water Pollution Prevention Program or the Santa Clara Valley Urban Runoff Pollution Prevention Program for post-construction water quality management. The Municipal Regional Permit would also require pollutant source control and project design requirements (i.e., LID) that would further reduce the potential for pollutants in stormwater runoff and degradation of surface water quality. Therefore, existing regulations and requirements would protect surface water quality and cumulative water quality degradation impacts would be less than significant.

HW-16. Dam Failure Inundation. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative impact regarding dam failure inundation. (LTS)

The Association of Bay Area Governments (ABAG) Dam Failure Inundation map shows the areas subject to dam failure inundation within the San Francisquito Creek Watershed. Most of the areas subject to dam failure inundation are already developed areas, except for areas adjacent to stream and tributary corridors. Development of areas adjacent to stream and tributary corridors would be subject to regulations and requirements associated with streambank instability protection and riparian habitat protection. Additional development or re-development within already developed areas subject to dam failure inundation would not substantially increase impacts associated with dam failure inundation; existing risks and exposure to dam failure inundation would not be greatly increased.

The federal Disaster Mitigation Act of 2000 (DMA 2000) requires that cities, counties, and special districts have a Local Hazard Mitigation Plan to be eligible to receive FEMA hazard mitigation funds. To assist local governments in meeting this requirement, ABAG received a grant from FEMA through the California Governor's Office of Emergency Services to prepare a multi-jurisdictional plan that fulfills the requirements of DMA 2000. The Plan and ABAG Annex were adopted by ABAG's Executive Board on March 17, 2005. As a participant in the ABAG multi-jurisdictional planning process, staff from the cities of Menlo Park and Palo Alto helped in the development and review of the comprehensive list of mitigation strategies in the overall multi-jurisdictional plan. The Emergency Operations Coordinator, within the City of Menlo Park Police Department, ensures that monitoring of the Menlo Park Annex occurs. The City of Palo Alto's Manager's Office ensures that monitoring of the Palo Alto Annex occurs. Additionally, ABAG ensures that the overall multi-jurisdictional plan is monitored and updated on an on-going basis.

No City of Menlo Park critical facilities are located within a dam failure inundation area.[120] Furthermore, the Palo Alto Comprehensive Plan includes an emergency management policy to minimize exposure to all hazards through emergency management planning (Policy N-55). The City of Palo Alto conducts emergency preparedness on an on-going basis and includes specific provisions for pre-emergency planning and post-disaster recovery. The City of Palo Alto has

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[120] ABAG Local Hazard Mitigation Plan Annex, City of Menlo Park Available at: http://quake.abag.ca.gov/mitigation/MenloPark-Annex.pdf FEMA Approved April 20, 2007.

an Emergency Plan to inform and protect citizens against emergencies such as dam failure inundation. Consequently, these existing mechanisms would ensure that cumulative impacts associated with dam failure inundation would remain less than significant.

HW-17. Violation of Any Water Quality Standards or Waste Discharge Requirements (WDRs). The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less-than-significant cumulative impact on violation of water quality standards and WDRs. (LTS)

Please see the discussion for Impact HW-9. Applicable WDRs include the Municipal Regional Permit, the Construction General Permit, the Industrial General Permit (where applicable), and any individual WDR or NPDES permit associated with construction dewatering (if required). If construction dewatering is minimal, discharges may be covered under the Construction General Permit. Applicable Water Quality Standards are listed in the Basin Plan and incorporated TMDLs. The Municipal Regional Permit and Construction General Permit were prepared to implement requirements for protecting surface water and groundwater quality and to ensure that water quality standards are met. Municipalities within San Mateo and Santa Clara Counties have incorporated requirements of the Municipal Regional Permit and Construction General Permit into their Municipal Codes and enforce these requirements through permit review and approval processes. Furthermore, the Municipal Regional Permit requires HM controls for projects within San Mateo and Santa Clara counties that may cause or contribute to increased bed or bank erosion. Additionally, development within the San Francisquito Creek Watershed and Santa Clara Subbasin would have to undergo the environmental review process that would identify potential project-specific impacts and mitigation such that overall development would not cause or contribute to substantial violations of water quality standards or waste discharge requirements and cumulative impacts would be less than significant.

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3.12 HAZARDOUS MATERIALS

Introduction

This section provides an analysis of the potential for the SUMC Project to expose persons or the environment to hazardous materials. Potential environmental impacts can be associated with the potential disturbance of contaminated soils or groundwater, if present in or near the SUMC Sites, as well as risk of spills from increased future use, disposal, and transport of hazardous materials and hazardous wastes associated with project construction or operation. Specific topics presented in this section include the types of hazardous materials that would be handled and hazardous wastes that would be generated, known on-site contamination from historic uses, the regulatory setting applicable to such activities, and applicable health and safety policies and procedures. The information in this section was extracted from Phase I and II Environmental Site Assessments (ESAs) prepared for properties within the campus, an Environmental Data Resources, Inc. (EDR) report, application materials provided by the SUMC Project sponsors, and information provided from regulatory agencies.

Issues identified in letters responding to the NOP and in written and oral comments received during the Planning and Transportation Commission and City Council scoping meetings for the SUMC Project were considered in preparing this analysis. Comments relevant to hazardous materials included those from the Department of Toxic Substances Control (DTSC) and the Santa Clara Valley Water District (SCVWD). SCVWD identified several historic fuel leak sites associated with underground storage tanks in the Hoover Pavilion Site and requested that these sites be evaluated. On July 1, 2004, SCVWD transferred the fuel leak Local Oversight Program (LOP) to the Santa Clara County (County) Department of Environmental Health (DEH). The County DEH has been supervising completion of steps toward site closure.[1] A discussion of fuel leak sites is included in the Existing Conditions discussion. DTSC requested that the properties' historic uses be described, and based upon that information, sampling be conducted to determine whether effects associated with remediation activities will need to be addressed in the EIR. Phase I and Phase II ESAs, which include the results of sampling, monitoring, and testing, have been submitted for certain properties within the SUMC Sites. DTSC also requested that, if remediation would be performed, the EIR include a discussion of potential air and health impacts associated with excavation activities, and risk of upset should there be an accident at the site. These concerns are addressed in this section, and Mitigation Measure HW-3.1 in Section 3.11, Hydrology, addresses risk of upset or exposure to hazardous materials during any remediation. Section 3.5, Air Quality, provides further discussions of air quality issues associated with construction activity on the project sites, and Section 3.11, Hydrology, provides further discussions of water quality issues associated with the potential for groundwater contamination.

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[1] Santa Clara Valley Water District. Letter Regarding Oversight Program Case Transfer: Stanford University Medical Center, 211 Quarry Road, Unincorporated 94304, SCVWDID-06S3W03H02. January 28, 2005. And Santa Clara County DEH. Letter Regarding Fuel Leak Investigation at Stanford University Medical Center, 211 Quarry Road, Palo A lot, Case No. 11-079, SCVWDID #06S3W03H02f.

Existing Conditions

Public health concerns addressed in this section and associated with the SUMC Project generally fall into four categories:

- *Hazardous Materials*. Hazardous materials include non-radioactive chemicals and products that may be harmful if improperly released to the environment or improperly handled by people. These include a broad spectrum of products, including pesticides, petroleum fuel products, paints and other coatings, and common household materials such as cleansers and other cleaning products. Hazardous materials also include radioactive, biohazardous, and medical materials. A more detailed definition of hazardous materials is provided under Classification of Hazardous Materials, below.
- *Hazardous Waste*. Hazardous wastes are produced when hazardous materials are used or discarded, and may be produced by manufacturing or other processes. A more detailed definition of hazardous waste is provided under Classification of Hazardous Materials below.
- *Contaminated Soil and Groundwater*. Contaminated soil and groundwater usually results from land uses that previously released hazardous materials or hazardous wastes into the soil, groundwater, or sewer systems. Leaking underground storage tanks (USTs) and sumps are common causes of such contaminated conditions, as are historic industrial activities that routinely spilled or disposed of hazardous materials or hazardous wastes into the soil or groundwater. Current and historical sources of soil and groundwater contamination in the SUMC Sites are described later in this section.
- *Hazardous Building Components*. The SUMC Project would involve building demolition and handling of hazardous building components. Examples of hazardous building components include asbestos-containing materials (ACMs), asbestos-containing building materials (ACBMs), electric transformers containing polychlorinated biphenyls (PCBs), USTs and aboveground storage tanks (ASTs), and lead-based paint. Applicable federal, State, and local legal requirements exist that relate to the safe maintenance and removal of these materials and are discussed later in this section.

Classification of Hazardous Materials. The term “hazardous material” is defined in different ways for different regulatory programs. For purposes of this EIR, the definition of “hazardous material” is the same as that in California Health and Safety Code Section 25501:

> …any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment.

Hazardous materials can be categorized as hazardous, non-radioactive chemical materials, radioactive materials, and biohazardous materials. For hazardous, non-radioactive chemical materials, the above definition is typically adequate. Radioactive and biohazardous materials are further defined as follows:

- *Radioactive materials* contain atoms with unstable nuclei that spontaneously emit ionizing radiation to increase their stability.
- *Biohazardous materials* include materials containing certain infectious agents (microorganisms, bacteria, molds, parasites, viruses) that normally cause or significantly contribute to increased human mortality or organisms capable of being communicated by invading and multiplying in body tissues.

Types of hazardous materials found in medical facilities include chemotherapy reagents and other pharmaceuticals; chemicals used to sterilize equipment; formaldehyde for specimen preservation; and solvents, oxidizers, corrosives, and stains used in clinical laboratories. Radioactive materials generally contain radioactive atoms; however, x-ray equipment (which does not involve any radioactive substances) is also regulated as radioactive material. Facilities maintenance activities, which occur at the SUMC Sites, require various common hazardous materials, including cleaners (which may include solvents and corrosives, in addition to soaps and detergents); paints; pesticides and herbicides; fuels (e.g., diesel); and oils and lubricants.

"Hazardous waste" is a subset of hazardous materials. For the purposes of this EIR, the definition of hazardous waste is essentially the same as that in California Health and Safety Code Section 25117, and in California Code of Regulations (CCR), Title 22 Section 66261.3. Hazardous wastes are wastes that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may either cause, or significantly contribute to, an increase in mortality or an increase in serious illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Hazardous wastes can generally be grouped into three categories, including hazardous chemical waste, radioactive waste, and medical waste. These three categories are further defined below:

- *Hazardous chemical wastes* are generally residuals of hazardous chemicals applied to various uses. Hazardous chemical waste can include residuals from mercury, photography liquids, photography solids, flammable liquids, aerosols, and laboratory solvents and chemicals.
- *Radioactive wastes* are radioactive materials that are discarded (including wastes in storage) or abandoned.
- *Medical waste* includes both biohazardous wastes (byproducts of biohazardous materials) and sharps (devices capable of cutting or piercing, such as hypodermic needles, razor blades, and broken glass) resulting from the diagnosis, treatment, or immunization of human beings, or research pertaining to these activities.

Surrounding Areas

Historic Uses and Storage of Hazardous Materials. Phase I and Phase II ESAs were performed on several portions of the SUMC Sites, and an EDR database search was conducted to further understand site conditions as they relate to historic hazardous materials use and storage. All Phase I ESAs were conducted in general accordance with the processes described in the American Society for Testing and Materials (ASTM) E1527-00 standard, entitled *Standards Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM guidelines).

Several facilities located in the SUMC Sites and surrounding area were listed as generators of hazardous materials. There are potential leakages of petroleum from former supply lines; potential for chemical contamination in soil and/or groundwater near, beneath, and around historical site features; potential for mercury and lead to leak into the soil and groundwater; and asbestos-containing materials. In addition, there are six USTs within the SUMC Sites and surrounding area (four within the Hoover Pavilion Site, and two just outside both SUMC Sites). The two USTs outside the Hoover Pavilion Site are at the former the Mobil Gas Station and Chevron Gas Station sites on Arboretum Drive and Quarry Road and are closed cases. At the Hoover Pavilion Site, two of the four USTs are still open cases with the County DEH. The remaining two had Palo Alto Fire Department (PAFD) oversight for closure, but the regulatory closure status is not known.

Fuel Leak Sites. USTs are known to have been used in a variety of settings for the purpose of storing petroleum hydrocarbons and waste oils within and just outside the SUMC Sites. Pursuant to SCVWD Ordinance 83-2, Section 6.1,[2] the SCVWD implements its statutory role in protecting the water supply by prohibiting the pollution of its water supplies, whether in surface streams, reservoirs, or conduits of any kind, or of groundwater, by any direct or indirect means.

The County DEH addresses the protection of water resources through the Local Oversight Program (LOP). The LOP addresses the protection of the County's water resources, specifically groundwater basins (i.e., Leaking Underground Storage Tank [LUST] cleanup program). Formerly managed by the SCVWD, the LOP was transferred to the County DEH in July 2004. For the purposes of this CEQA review and in response to the NOP comments received from the SCVWD, additional data maintained by the County DEH were reviewed to further assess the status of reported fuel leaks in the vicinity of the SUMC Sites.[3] These LUSTs are identified and described in more detail below in the SUMC Sites discussion and in the Applicable Plans and Regulations subsection.

SUMC Sites

Existing Use and Storage of Hazardous Materials. Slight amounts of commercial hazardous materials are used for daily operations throughout the SUMC Sites, including the use of paints, solvents, metals, fuels, oils, and pesticides. In most circumstances, the potential risks posed by

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2 Santa Clara Valley Water District, NOP Stanford University Medical Center Facilities Renewal and Replacement Project, and Simon Properties-Stanford Shopping Center Expansion, September 28, 2007.

3 Santa Clara County LUSTOP website: http://lustop.sccgov.org/, accessed November 29, 2007.

hazardous materials use and storage are primarily local and, therefore, limited to the immediate vicinity of such use. However, there are several buildings located within the SUMC Sites that were constructed before 1953 and thus may contain asbestos.

Hazardous materials in larger quantities have been and are currently handled and stored at the SUMC Sites. These materials include flammable gas and liquids, non-flammable and non-toxic gas, oxidizers, and corrosive and toxic materials. If handled and stored incorrectly, these chemicals, radioactive materials, and biohazardous materials can pose both physical and health risks. The potential hazards due to the existing use and storage of hazardous materials at the SUMC Sites are discussed in further detail below.

The SUMC has a Hazardous Material Business plan on file with the PAFD, and the plan would meet applicable regulations prior to demolition and redevelopment of relevant facilities. The current types and amounts of hazardous chemicals existing at the Main SUMC Site are shown in Table 3.12-1. This table provides a summary of the listing of on-site hazardous chemicals from the SUMC Project application.[4] As shown in the table, facilities at the Main SUMC Site currently handle hazardous materials including flammable gas and liquids, non-flammable and non-toxic gas, oxidizers, and corrosive and toxic materials. In addition to the materials described in the table, facilities maintenance activities require various common hazardous materials, including cleaners (which may include solvents and corrosives, in addition to soaps and detergents); paints; pesticides and herbicides; fuels (e.g., diesel); and oils and lubricants.

The hazards posed by chemicals, radioactive materials, and biohazardous materials vary. Some chemicals can pose physical hazards (e.g., chemical burns) or health hazards (e.g., poisoning), including potential acute or chronic illnesses. Acute illness is known as an illness with an abrupt onset and short course, whereas a chronic illness is a long standing illness.[5] The properties and health effects of different chemicals are unique to each chemical and depend on the extent to which an individual is exposed. Exposure to biohazardous materials can cause a range of illnesses, depending on the infectious agent encountered. Some infections can result in short-term discomfort (e.g., mild symptoms that can easily be treated or go away by themselves), while others can result in serious effects (e.g., dangerous disruptions of life functions). Some chronic diseases may or may not be curable or treatable. Some diseases may be communicable. In all of the above cases, the risks posed by the hazardous materials depend on the potential for exposure.

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4 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 7, Table 7-1.

5 Medical Dictionary. Webster New World. Acute and Chronic Illness, definition. http://www.medterms.com/script/main/art.asp?articlekey=2731. Accessed November 28, 2008.

Table 3.12-1[a,b,c]
Existing Amounts of Hazardous Chemicals at the Main SUMC Site

		Existing Amount On-site		
Type of Material	**Examples**	**Solids (pounds)**	**Liquids (gallons)**	**Gases (cubic feet)**
Explosive, Mass Explosion	Spray paint and other aerosols, acetylene, propane, some refrigerant gases	0.28	0.00	0.00
Explosive, Minor Blast	Spray paint and other aerosols, acetylene, propane, some refrigerant gases	0.02	0.00	0.00
Flammable Gas	Spray paint and other aerosols, acetylene, propane	102	0.00	6,651
Non-Flammable, Non-Toxic Gas and Oxidizers	Aerosols, carbon dioxide (CO_2), most refrigerant gases, nitrous oxide, oxygen, liquid oxygen	3,058	1,535	158,783
Flammable Liquids	Gasoline, fuel oil isopropanol, acetone, ether, other solvents	0.00	2,879	0.00
Flammable Solid	Lead acid batteries, cycloexylamine - formula 48, chloromethoyisothiazolin, magnesium, nitrocellulose	269	0.06	0.00
Spontaneously Combustible	Zep formula 300, Freon 12 and 22, glutaraldehyde, phosphorus	5.57	0.03	0.00
Water Reactive Flammable	Aluminum powder, calcium carbide, calcium, lithium, magnesium powder, sodium hydride	3.74	0.05	0.00
Oxidizer	chlorate, permanganate, inorganic peroxide, or a nitrate	147	164	0.00
Organic Peroxide	Benzyl peroxide, hydrogen peroxide, acetyl acetone peroxide	1.07	30.2	0.00
Radioactive	Isotopes, uranium hexafluoride	0.87	0.00	0.00
Corrosive Materials	Lead acid batteries, cycloexylamine - formula 48, chloromethoyisothiazolin	375	749	0.00
Toxic Materials (solid or liquid)	Zep formula 300, Freon 12 and 22, glutaraldehyde, mercury, lead	726	442	0.00
Other Miscellaneous Hazards	Dry ice, asbestos, PCBs, polymeric beads, wheel chairs/electric vehicles	5,176	527	0.00
Moderately Toxic	Phenol, ammonia	0.00	2.00	0.00
Slightly Toxic	Cleaning solvents, ethyl acetate, ethanol,	0.00	31.0	0.00
Flammable	Solvents, varnish, ammonia	0.00	31.0	0.00

Table 3.12-1[a,b,c]
Existing Amounts of Hazardous Chemicals at the Main SUMC Site

Type of Material	Examples	Existing Amount On-site: Solids (pounds)	Existing Amount On-site: Liquids (gallons)	Existing Amount On-site: Gases (cubic feet)
Combustible	Aerosols, oxidizers	136	218	0.00
Suspect Carcinogen/Mutagen	Acephate, benomyl, carbaryl	0.00	33.0	0.00
Halogenated Solvent	Trichloroethylene, perchloroethylene, methylene chloride, carbon tetrachloride, methyl chloroform, methyl iodide, ethylene dibromide	0.00	2.00	0.00
Skin Irritant	Strong acids (hydrochloric, sulfuric, and nitric acids), solvents (paint remover, alcohol), and caustics (sodium hydroxide, potassium hydroxide)	0.00	121	0.00
Hepatotoxin	Carbon tetrachloride, dimethylformamide, pesticides, solvents	0.00	2.00	0.00
Nephrotoxin	Heavy metals, carbon tetrachloride	0.00	2.00	0.00
Neurotoxin	Venoms, nerve agents	0.00	2.00	0.00
Lung Irritant	Ozone, smoke, chemical fumes, dust, other air pollution	0.00	121	0.00
Eye Irritant	Ozone, nitrogen dioxide, formaldehyde, smoke, dust, volatile organic compounds (VOCs)	0.00	121	0.00
California Prop. 65 Carcinogen	Chloroform, carbon tetrachloride, beryllium compounds, benzene, endrine, ethyl bromide, formaldehyde, lithium citrate, lovastatin, mercury compounds	0.00	2.00	0.00

Source: SUMC, 2010.

Notes:

a. Some chemicals fall into more than one category; therefore, the columns presented here cannot be added to derive actual totals.

b. This table provides a reasonable rough estimate of the materials that would be located at the SUMC; however, due to the continuing advancements in technology, the list of needed chemicals and quantities may change in the time between this estimate and the opening of the SUMC Project.

c. This table provides a summarized version of that provided in the listing of on-site hazardous materials from the SUMC project application.

During the course of patient care and facility maintenance operations at the SUMC Sites, the SUMC applicants use various materials, some of which pose potential hazards. For example, clinical laboratories use potentially hazardous chemicals to analyze patient blood and urine samples. Radioactive materials are used to treat certain kinds of cancer. Various patient diagnosis and treatment activities involve potentially biohazardous materials (infectious agents). Hazardous materials use often results in byproducts that must be handled and disposed of as hazardous wastes.

The hospitals and clinics at the SUMC Sites also administer radiopharmaceutical materials (radioactive material) to patients for both diagnostics and therapeutic purposes.[6] Table 3.12-2 through Table 3.12-4 list the existing radioactive material at the SUMC Sites. Most materials listed in Table 3.12-2 are administered in the Nuclear Medicine Department at the Main SUMC Site and patients are free to leave the facility after they have been given the treatment. Certain therapy procedures require that a patient be housed on-site for a few days before being allowed to leave either hospital facility (SHC or LPCH). In all cases, the half-lives[7] of the radiopharmaceuticals are relatively short. No radioactive waste from Table 3.12-2 sources is generated since the radiopharmaceutical materials are allowed to decay for ten half-lives and then disposed as non-radioactive. Table 3.12-3 lists the longer half-life radioactive materials used by the School of Medicine. Additionally, six isotopes are used in the Nuclear Medicine Department to calibrate instruments (Table 3.12-4). All radioactive material use at the SUMC Sites, including disposal practices, is governed by Stanford University's Radioactive Material License with the State.

Table 3.12-2
Existing Radiopharmaceutical Radioactive Material at SUMC Sites

Isotope	Monthly Average (mCi)[a]	Half Life (hours)
F-18	4,704.0	1.83
1-123	111.9	13.2
Tc99m	21,058.0	6
In-Ill	68.7	67.37
Tl-201	15.3	73.1
1-131	438.8	192.96
Ga-67	0.3	78.26
P-32	0.2	342.77
Y-90	16.0	3.19

Source: SUMC, 2010.

Note:

a. Millicurie (mCi): A unit of radioactivity equivalent to 0.001 curies.

6 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 7.

7 The radioactive half-life for a given radioisotope is the time for half the radioactive nuclei in any sample to undergo radioactive decay. After two half-lives, there would be one fourth the original sample, after three half-lives one eighth the original sample, and so forth.

Table 3.12-3
Existing Radioactive Material Use by the School of Medicine at SUMC Sites

Isotope	Approved Level (mCi)[a]	Current Annual Usage (mCi)[a]	Half-life
C-14	40.00	0.33	5,730 years
H-3	722.00	17.54	12.3 years
I-125	36.00	29.53	60.1 days
P-32	189.00	115.32	14.3 days
S-35	378.00	16.38	87.4 days
U-238	0.30	0.01	4.5x 10^9 years
Cr-51	10.00	0.00	27.7 days
I-131	0.01	0.00	8.01 days
P-33	18.00	0.00	25.4 days
Tc99m	1.00	0.00	6 hours

Source: SUMC, 2010.

Note:

a. Millicurie (mCi): A unit of radioactivity equivalent to 0.001 curies.

Table 3.12-4
Existing Radioactive Material Sealed Sources at SUMC Sites

Isotope	mCi on Hand (mCi)[a]	Typical Use
Gd-153	less than 200	PET Scanner attenuation sources
Ge-68	less than 200	PET Scanner attenuation sources
Co-57	less than 100	Dose Calibrator Check Sources and SPECT Camera Flood Sources
Cs-137	less than 1	Dose Calibrator Check Sources
Eu-152	less than 1	Dose Calibrator Check Sources
Ba-133	less than 1	Dose Calibrator Check Sources

Source: SUMC, 2010.

Note:

a. Millicurie (mCi): A unit of radioactivity equivalent to 0.001 curies.

In addition to radioactive material used at the hospitals and clinics at the SUMC Sites, an irradiator is located in the existing School of Medicine buildings. It contains 2,000 curies of Cs-137 that is in the form of an encapsulated, sealed source. It is anticipated that this irradiator would be replaced within the new FIMs buildings.

701 Welch Road. On June 7, 2006, a Phase I ESA was prepared by Aquifer Sciences, Inc. for the 701 Welch Road site to determine current environmental conditions at that site.[8] Based on aerial photographs reviewed for that report, as of 1939, the site appeared to be part of a large farm or pasture lands. This condition remained unchanged until 1957-61, when the existing buildings were constructed. The existing buildings consist of three office buildings (Building A, B, and C) and a small storage building (Building D). The office buildings, which have been used primarily as medical offices, were constructed in the late 1950s and early 1960s. The buildings have been renovated several times since their original construction, including the addition of an elevator tower in 2001.[9] The buildings are surrounded by asphalt-paved parking, landscaping, and related improvements. Access to Building B to perform the Phase 1 investigation was not permitted.

The Phase I ESA for 701 Welch Road made the following recommendations:

- Inspection of Building B, the Addiction Research Foundation, should be performed to better understand the small-quantity generator status of this facility. A small quantity generator is any facility that generates less than 100 kilograms of hazardous waste per month.
- Based on the age of the buildings, it is possible that asbestos-containing materials could be present. Prior to demolition, an asbestos survey should be conducted.

An addendum Report to the Phase I ESA was completed by Aquifer Sciences, Inc. on August 14, 2006 to further document current environmental conditions at 701 Welch Road.[10] At the time of the inspection on June 28, 2006, access was allowed to perform environmental inspection at Building B.

The Addendum Report concluded that there were several environmental concerns regarding the use, handling, and disposal of chemicals at Building B. The Addendum Report also recommended that a Phase II ESA be performed, which could possibly include sampling and analysis of soil, groundwater, wastewater, and residues on surfaces such as laboratory countertops, fume hoods, sinks, sumps, floors, and drain lines.

703 Welch Road. On June 1, 2006, a Phase I ESA was performed by Aquifer Sciences, Inc. for the 703 Welch Road site to determine current environmental conditions at that site.[11] The Phase I ESA

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8 Aquifer Sciences, Inc., *Phase I Environmental Assessment*, 701 Welch Road, Palo Alto, California, June 7, 2006.

9 Based on further research conducted by Annette Walton, Stanford Environmental Manager, an elevator tower was installed in 2001 to meet ADA requirements and that no elevator existed prior to this.

10 Aquifer Sciences, Inc., Addendum Report to Phase I Environmental Assessment, Building B, 701 Welch Road, Palo Alto, California, August 14, 2006.

11 Aquifer Sciences, Inc., *Phase I Environmental Assessment,* 703 Welch Road, Palo Alto, California, June 1, 2006.

included a review of aerial photographs which revealed that, as of 1939, the site appeared to be part of a large farm or pasture lands. A 1965 aerial photograph showed the current building that occupies the site.

The site currently contains an office building, constructed in 1958 that has been used primarily over the years as dental offices. The building has been renovated several times since the original construction, including a second-floor addition built in 1963. In 1993, a new hydraulic-lift elevator and equipment room were installed. The building is surrounded by asphalt-paved parking areas, landscaping, and related improvements.

Dentists typically use metals in the preparation of amalgam. To prevent these chemicals from being discharged into wastewater, amalgam separators are required. The building contains four amalgam separators in four basement areas to filter out the metals from the dentists' offices. Wastewater from each separator is conveyed to a sump that, in turn, discharges the wastewater onto either the landscaping or pavement at four locations outside the building.

The Phase I ESA made the following recommendations:

- A more thorough inspection should be made of each of the four amalgam separators.
- Water samples should be taken from each of the four sumps and analyzed for amalgam constituents: mercury, silver, tin, copper, and zinc.
- Based on the age of the building, it is possible that asbestos containing materials are present at the site. Prior to any demolition activities an asbestos survey should be prepared.
- Prior to building demolition, the sink piping (P-traps) and other surfaces should be tested for the presence of metals and other chemicals. If chemicals are detected, proper cleaning and/or disposal of piping, equipment, and other materials may be necessary.
- When the building is demolished, the soil beneath the elevator shaft should be inspected. If there is any sign of a hydraulic fluid release, a soil sample should be collected for laboratory analysis. The soil sample should be analyzed for PCBs. If PCBs or hydraulic fluid is present in the soil sample, the extent of the release should be defined. Soil containing PCBs or hydraulic fluid should be excavated and transported to a regulated landfill for disposal.

A Phase II Soil and Wastewater Quality Evaluation was published for the 703 Welch Road site (also completed by Aquifer Sciences, Inc.) on July 19, 2006.[12] The Phase II was conducted on June 2, 2006 and a comprehensive investigation completed on June 24, 2006. The objective of this assessment was to evaluate the sediment and soil quality in the vicinity of four basement areas where wastewater from amalgam separator systems has been discharged outside the buildings and onto the lawns, the landscaping, or pavement, and to collect wastewater from each separator to determine water quality.

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12 Aquifer Sciences, Inc., *Phase II Soil and Wastewater Quality Evaluation,* 703 Welch Road, Palo Alto, California, July 19, 2006.

On June 2, 2006, shallow soil and sediment samples were collected at four discharge points outside the building in proximity to the amalgam separator discharge points and one sample from an unaffected area to represent background conditions. Four wastewater samples were also analyzed.

The surface samples were identified as S1 and S4 and collected at grade; the soil samples were designated S2 and S3 and collected at 1 foot below ground surface (bgs). The background sample was designated as S5. The water samples were collected from the separator system and identified as VW1 through VW4. All the soil and sediment samples were analyzed for amalgam constituents: copper, mercury, silver, tin, and zinc by EPA method 6020A. The four wastewater samples were also analyzed for the amalgam constituents by EPA Method E200.8.

Soil samples were also compared to residential and commercial Environmental Screening Levels (ESLs) established by the San Francisco Bay Regional Water Quality Control Board (RWQCB) for soils. In addition, the soil samples were compared to the Total Threshold Limit Concentration (TTLC) values and Soluble Threshold Limit Concentration (STLC) values established by the State to provide concentration limits for the classification of hazardous substances. As a rule-of-thumb, samples that contain metals at concentrations exceeding the numerical value of 10 times the STLC should be analyzed for soluble concentrations. The results of the initial investigation are provided below:

- Copper concentrations in the soil samples ranged from 44 milligrams per kilogram (mg/kg) to 350 mg/kg; only one sample (S3) exceeded the commercial/industrial ESL for copper (230 mg/kg). None of the samples contained copper at concentrations exceeding the TTLC value of 2,500 mg/kg, but sample S3 did exceed 10 times the STLC value of 250 milligrams per liter (mg/L).
- Mercury concentrations in the soil samples ranged from 18 mg/kg to 1,500 mg/kg; all samples exceeded the commercial/industrial ESL for mercury (10 mg/kg). The background sample (S5) contained mercury at 18 mg/kg and sample S2 contained mercury at 19 mg/kg; the remaining samples were elevated compared to the background concentration. Samples S1, S3, and S4 contained mercury at concentrations exceeding the TTLC value of 20 mg/kg, and all samples exceeded 10 times the STLC value of 2.0 mg/L.
- Silver concentrations in the soil samples ranged from 4.7 mg/kg to 1,100 mg/kg; three samples (S1, S2 and S4) exceeded the commercial/industrial ESL for silver (40 mg/kg). The background sample (S5) contained silver at 4.7 mg/kg and sample S2 contained mercury at 14 mg/kg; the remaining samples were elevated compared to the background concentration. Sample S1 contained silver at a concentration exceeding the TTLC value of 500 mg/kg, and three samples (S1, S3, and S4) exceeded 10 times the STLC value of 50 mg/L.
- Tin concentrations in the soil samples ranged from 4.7 mg/kg to 370 mg/kg. There is no commercial/industrial ESL for tin. The background sample (S5) contained tin at 4.7 mg/kg and tin was not detected in sample S2; the remaining samples were elevated compared to the background concentration. No TTLC or STLC values have been established for tin.
- Zinc concentrations in the soil samples ranged from 160 mg/kg to 810 mg/kg; three samples (S1, S3 and S4) exceeded the commercial/industrial ESL for zinc (600 mg/kg). The

background sample (S5) contained zinc at 160 mg/kg and sample S2 contained zinc at 250 mg/kg; the remaining samples were elevated compared to the background concentration. None of the samples contained zinc at concentrations exceeding the TTLC value of 5,000 mg/kg or the STLC value of 2,500 mg/L.

Wastewater samples were also compared to ESLs established by the San Francisco Bay RWQCB for groundwater. The results of the initial investigation are provided below:

- Copper concentrations in the wastewater samples ranged from 450 micrograms per liter (μg/L) to 2,500 μg/L; all samples exceeded the ESL for copper in groundwater (3.1 μg/L).
- Mercury concentrations in the wastewater samples ranged from 14 μg/L to 1,400 μg/L; all samples exceeded the ESL for mercury in groundwater (0.012 μg/L).
- Silver concentrations in the wastewater samples ranged from 12 μg/L to 1,100 μg/L; all samples exceeded the ESL for silver in groundwater (0.19 μg/L).
- Tin concentrations in the wastewater samples ranged from 23 μg/L to 1,200 μg/L. There is no ESL for tin in groundwater.
- Zinc concentrations in the wastewater samples ranged from 390 μg/L to 3,000 μg/L; all samples exceeded the ESL for zinc in groundwater (81 μg/L).

On June 24, 2006, Aquifer Sciences, Inc. performed a comprehensive sampling program to investigate the lateral and vertical extent of the metals found in shallow soil in the vicinity of the four basement areas on June 2, 2006. A total of 22 boring locations were selected and drilled to a depth ranging from 9 to 20 feet bgs. In all, 73 soil samples were collected for laboratory analysis. Groundwater was not encountered in any of the borings. The samples were analyzed for mercury, silver, and pH levels.

This follow-up investigation revealed that while elevated concentrations of metals were detected in shallow soil and sediment samples collected in the immediate vicinity of the wastewater discharge points, the area impacted was limited in lateral and vertical extent. Based on the analytical data, the areas impacted were limited in lateral extent to those areas immediately to the hose ends (a 4- to 9-square-foot area around each waste water discharge point). The analytical results show that the vertical impact to soil from each wastewater discharge point is limited in depth of the upper 2 feet outside the four basement areas. No significant metals concentrations were detected in soil samples collected adjacent to the floor sumps, with the exception of one sample (VS2-5), collected at a depth of 5 feet below the basement. It contained mercury at a concentration of 14 mg/kg, which exceeds the commercial/industrial ESL of 10 mg/kg.

The Phase II Soil and Wastewater Quality Evaluation made the following recommendations:

- Discontinue the practice of discharging wastewater from the amalgam separators to the landscaping or pavement.
- Reroute any water collecting in the floor sumps into the sanitary sewer system.

- If the building is demolished, inspect the sanitary sewer line for signs of leakage at joints and bends. If the sanitary sewer line is in poor condition or leakage has occurred, collect samples of the surrounding soil. Analyze the samples for mercury, silver, and pH levels to evaluate whether disposal of wastewater from the dental offices has impacted soil quality.

A Lead Survey and Evaluation was conducted for 703 Welch Road in June 2005.[13] The purpose of this screening survey was to detect the presence of lead-based paint (LBP)[14] or lead-containing paint (LCP)[15] on major building components throughout the site. One sample tested positive for LBP found on the exterior railing components. Nine samples tested positive for LCP. The report authors recommended more comprehensive lead inspection prior to significant disturbance of painted surfaces.

A Limited Asbestos Survey and Evaluation was conducted for 703 Welch Road by ProTech Consulting and Engineering in May 2006[16] to locate ACM and ACBM within the building. ACMs were discovered in wall and ceiling sheetrock, joint tape and compound, acoustical ceiling plaster and spray, sheetrock surfacing texture, and duct tape. The report recommended that any ACM that could be impacted during repairs, renovation, or demolition be removed prior to those destructive activities.

1101 Welch Road. A Phase I ESA was conducted by Geomatrix for 1101 Welch Road in February 1996.[17] Stanford University has owned the property at 1101 Welch Road since 1885. The property was leased to Medical Plaza, Inc. from 1957 to 1982, and Medical Plaza, Inc. built the medical buildings in the late 1950s. In 1982 the lease was reassigned to Medical Plaza Associates, and has subsequently been reassigned to SHC. The property contains three single-story buildings: Building A, Building B, and Building C. The area around the buildings is paved with asphalt and the landscaping is mature. The general uses of the buildings along with hazardous contents are described as follows:

- Building A: Contains a blood laboratory; no x-ray rooms or chemicals were present.
- Building B: Contains two blood laboratories, an x-ray room, and a dark room, as well as supporting offices. Offices contained paint, grout, wall finish, and paint-related chemicals. The dark room contained x-ray developing chemicals, photo processing chemicals, and silver repositories. A "Visible Laser Radiation Machine" was located in one office as well as liquid nitrogen, a cylinder of oxygen, and dermatology medication.
- Building C: Contains several offices with x-ray rooms and darkrooms. The dark rooms contained photo processing chemicals and byproducts containing silver. This building also contains a pharmacy.

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13 Protech Consulting and Engineering, *Lead Survey and Evaluation*, 703 Welch Road, Palo Alto, California, July 21, 2005.

14 Lead-based paint (LBP) contains a concentration of 1 milligram of lead per square centimeter (mg/cm^2) or greater.

15 Lead-containing paint (LCP) contains a concentration of less than 1 milligram per square centimeter (mg/cm^2) of lead.

16 Protech Consulting and Engineering, *Limited Asbestos Survey and Evaluation*, 703 Welch Road, Palo Alto, California, May 23, 2006.

17 Geomatrix Consultants, *Phase I Environmental Site Assessment,* 1101 Welch Road, Palo Alto, California, February 1996.

The 1101 Welch Road site also contains a transformer vault area including a heating equipment room, a cooling equipment room, and a power switch room. The vault area includes a locked biohazardous waste storage locker and the power switchboard room. The cooling system area includes a chemical storage area without secondary containment. It was noted in the Phase I ESA that the storm drain in this area should be sealed in order to prevent release of chemicals into the storm or sanitary sewer.

Several of the current and former x-ray rooms and dark rooms in the offices of the buildings were tested for the presence of lead in the walls and paint. Lead was detected in all of the areas tested, probably due to LBP. However, it is also possible that the walls are lead lined. No asbestos surveys or tests were conducted.

The Phase I ESA recommended the following:

- If painted walls are to be disturbed through construction renovation or maintenance activities, the Occupational Safety and Health Administration (OSHA) and Cal/OSHA worker safety protocol should be followed.
- All chemical waste stored on the property should be disposed of off-site.
- The chemicals stored in the cooling areas of Building C should be stored in a secondary containment area.
- The floor drain in the cooling equipment area of Building C should be sealed.
- Given that no hazardous waste spills or accidents have been reported and no underground storage tanks exist, a Phase II analysis is not recommended for this site.

Hoover Pavilion Site. On September 2007, a limited Phase I ESA was conducted by Geomatrix for the Hoover Pavilion Site, located at 211 and 215 Quarry Road.[18] The Phase I ESA[19] included a site reconnaissance, review of historical photographs and topographic maps, selected agency file review, review of regulatory databases, interviews of local government officials regarding the current regulatory status of the site, and interviews of personnel currently associated with the site.

According to the Phase I ESA, the aerial photographs and topographic maps indicate that the site appears to have been undeveloped, agricultural land until the late 1930s; on-site buildings first appear in photographs and maps in 1939. The surrounding land uses appear to have been commercial and residential since the 1940s, with the exception of Stanford University, which appears in photographs and maps as early as 1899. Buildings constructed prior to 1981 could have been built with hazardous materials such as asbestos, PCBs, lead, and mercury.

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18 Geomatrix, Phase I Environmental Site Assessment, Hoover Pavilion, September 2007.

19 The SUMC Project sponsors elected to not conduct the ESA according to ASTM E1527-05, which is updated relative to ASTM E1527-00 to include provisions of U.S.EPA All Appropriate Inquires (AAI) Final Rule (40 CFR 312), which took effect November 1, 2006. AAI is the prevailing standard for providing liability protection as an innocent landowner, a bona fide prospective purchaser, or a contiguous property owner under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA).

Historical uses and operations of the Hoover Pavilion Site include medical services, welding, spray-painting, printing/mimeography, and automobile body repairs and maintenance. The welding shop ceased operations and was dismantled in 1995 in accordance with PAFD procedures; the printing/mimeography operations ceased in the mid-1980s; and spray painting of miscellaneous items still occurs on an intermittent basis. As a result of these historical uses, the Phase I ESA identified certain site features that could impact environmental conditions at the site: two 2,200-gallon USTs (diesel); one 750-gallon UST (primarily diesel); one 350-gallon UST (waste oil); a boiler room with sump; and three oil-filtered transformers. The two 2,200-gallon USTs were emptied and closed in-place with neat cement slurry under a permit with the PAFD. The 750-gallon UST (which was installed in the 1960s under a permit with the PAFD) was removed in 1996, and the 350-gallon waste oil UST was emptied and closed in-place in 1987. According to interviews conducted as part of the Phase I ESA report, the boiler room and sump were closed in 2000, and the three oil-filled transformers were removed and replaced with dry type transformers in the mid-1990s.

Underground Storage Tanks. In 1940, two 2,200-gallon USTs were installed adjacent to what is now the south wing of the Hoover Pavilion (please refer to Figure 3.12-1). The tanks were known to contain both diesel fuel and fuel oil from the time of installation. In 1986, petroleum hydrocarbons were detected in the soil during a subsurface investigation conducted to ascertain closure options for the two 2,200-gallon diesel tanks. Hydrocarbon migration was identified from the tanks into the surrounding soil and groundwater, revealing a hydrocarbon plume consisting of degraded diesel and some type of heavier fuel oil. The tanks were emptied in 1987 and closed in place (for structural reasons) under a permit with the PAFD in 1996.[20] Product supply and return lines associated with the tanks, which extended from the USTs to a nearby boiler room and to a power substation to the west, were flushed and filled in place or capped in 1996.

Soon after the tanks were emptied, Stanford Health Services began conducting quarterly hydrocarbon monitoring. The May 1995 Hydrocarbon Investigation for the Hoover Pavilion Site recommended "natural attenuation" to control the migration of hydrocarbons.[21] The First Quarter 2001 Groundwater Monitoring Report confirmed that the plume of dissolved-phase hydrocarbons was relatively stable.[22] Groundwater was analyzed for concentrations of total petroleum hydrocarbons as diesel (TPH-D), volatile organic compounds (VOCs), and oxygenates. Samples detected TPH-D at 432 μg/L from the source well (MW-6), which is explained as a result of its location next to the source (the UST) and natural seasonal fluctuations of water levels. Water levels were recorded to range between 41 and 53 feet bgs. VOCs were also detected as trichlorofluoromethane (Freon-11); however, these concentrations were well below the State Maximum Contaminants Levels (MCL) for Freon-11 in drinking water, and did not represent a threat to groundwater quality. No oxygenates were detected in any of the wells.

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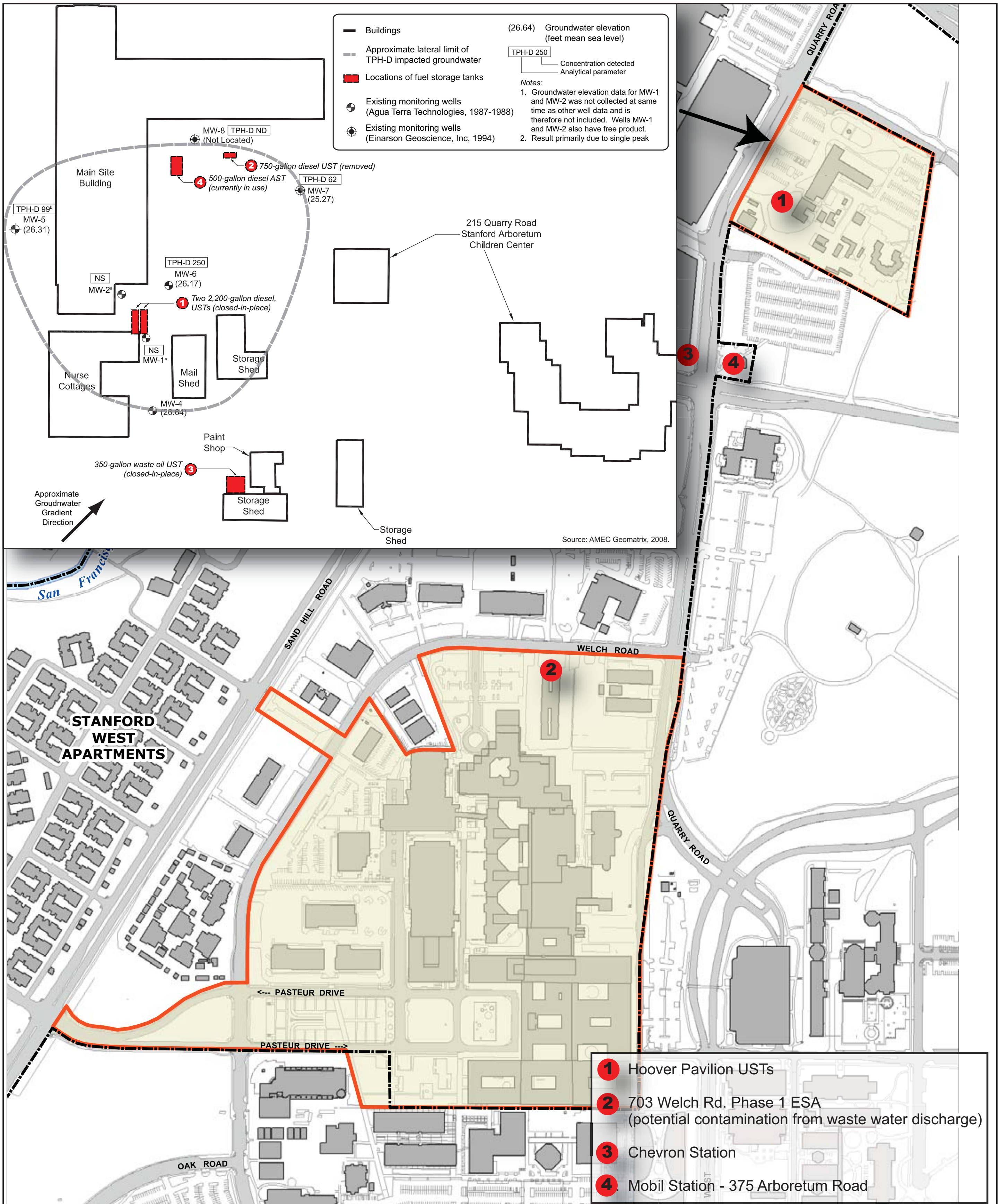
20 Aqua Terra Technologies, Underground Storage Tank Investigation, Hoover Pavilion, February 20, 1987.

21 Einarson Geoscience, Inc., *Hydrocarbon Investigation Report – Hoover Pavilion*, Stanford Health Services, May 1995.

22 Conor Pacific, First Quarter 2001 Groundwater Monitoring Results – Hoover Pavilion, April 2001.



***Source*: PBS&J, 2008.**

FIGURE 3.12-1
Location of Underground Storage Tanks in Project Vicinity

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Stanford University Medical Center Facilities Renewal and Replacement Project

A 750-gallon steel UST was installed in the 1960s on the Hoover Pavilion Site (see Figure 3.12-1), and was located adjacent to the loading dock behind the Hoover Pavilion Site. The tank was used as a diesel fuel storage tank for the emergency generator and the boiler room sump.[23] The tank remained in use as diesel fuel storage until 1996 when it, as well as most of its associated piping, was emptied and removed under a permit with the PAFD. Soil sampling was conducted after the tank was removed for TPH-D, benzene, toluene, ethyl benzene, and xylenes (collectively known as BTEX). TPH-D was detected (at concentrations ranging from 180 to 1,400 parts per million [ppm]); BTEX were not detected. The Phase I ESA states that it is likely that residual TPH-D remains in shallow soil beneath the old supply lines, which ran from the tank to the boiler sump and underneath the loading dock. No additional sampling was performed beneath the supply lines. The removal of this tank was overseen by the PAFD, and any further action regarding clean up with this tank would be done under the oversight of the County.

A 350-gallon waste oil tank was installed on the southwest corner of the property at the Hoover Pavilion Site near what is now a storage shed. This tank was associated with a former auto repair shop. Soil sampling conducted in 1986 identified petroleum hydrocarbons at 100 ppm. The tank was emptied and closed in place in 1987. Further analysis was conducted in 1994 to assess the soil condition under the UST, and results indicated minimal residual concentrations of tetracholoroethene, THP-D, chromium, nickel, and zinc. Case closure was requested for this tank in 1994; however, there is no record at SCVWD of the closure letter.[24]

Conclusions and Findings for the Limited Hoover Pavilion Phase I ESA. Based on the data reviewed, the Phase I ESA made the following conclusions:

- For the two 2,200-gallon USTs closed in place and leaking associated residual petroleum hydrocarbons remaining in subsurface media (soil and/or groundwater):
  - petroleum-impacted soils remain below ground surface in the vicinity of tanks;
  - free product likely is present in on-site monitoring wells;
  - while previous investigations have shown that impacts to subsurface media from these USTs is limited to within the Hoover Pavilion Site boundaries, the presence of free product in site wells leaves the site open from a regulatory perspective; and
  - besides passive free product removal, no other remedial actions have been implemented at the site.

23 Conor Pacific, First Quarter 2001 Groundwater Monitoring Results – Hoover Pavilion, April 2001.
24 Personal communication between Carolina Morgan, of PBS&J and Mamerto Jorvina of Santa Clara County Department of Health and Services regarding case ID 06S3W03H02f – Stanford University Medical Center at Hoover Pavilion (211 Quarry Road, Palo Alto, CA), February 15, 2008.

- The adequacy and completeness of the regulatory closure for the 750-gallon diesel UST and the 350-gallon UST is not known.

  - While it is known that the 750-gallon diesel tank was removed under permit by the PAFD, no documentation was found in any agency files to indicate a "No Further Action" certificate was submitted for this tank.

  - Case closure was recommended by a previous consultant for the closed-in-place 350-gallon UST; however, based on files available at the PAFD, it is not known whether a closure request was submitted and approved. This tank should be removed during future redevelopment activities with PAFD oversight.

  - It is known that polynuclear aromatic hydrocarbons are commonly associated with waste oil; however, these have not been tested in the vicinity of the 350-gallon waste UST.

- Potential leakage of petroleum from the former supply lines has not been investigated.

- Potential of chemical contamination in soil and/or groundwater near and beneath and around site features, including:

  - The dry storage shed adjacent to the Paint Shop, located on the southern part of the site has historically functioned has an auto body repair shop. However, the extent of operations at this location is not known.

  - The sump motor associated with the former boiler was fueled with diesel fuel from on-site USTs. It is possible that chemicals are present in soil near and beneath the former boiler sump motor.

  - Regarding the spray-painting operation, it is possible lead-based paints were used at some point, and consequently lead may have been expelled from the fume hood and deposited in the vicinity of the Paint Shop.

On March 12, 2008, the County DEH requested that quarterly monitoring of groundwater quality be reinstated so that the current levels of contamination in groundwater can be assessed. At this time, preliminary data has been submitted to the County DEH on groundwater testing for the two 2,200-gallon USTs located at 211 Quarry Road. As indicated by the County DEH, four groundwater samples were collected on August 18th and 19th, 2008, from four monitoring wells located within and in the immediate vicinity of the two tanks. Groundwater samples from MW-4, MW-5, MW-6 and MW-7 were tested for diesel range organics. The results indicated maximum levels of TPH-D at 180 μg/l (ppb) in MW-6, which is above the RWQCB water Environmental Screening Level (ESL)[25] and water quality objective of 100 μg/l for drinking water; however, it was below the ESL of 210 μg/l for non-drinking water groundwater.[26] All other samples were below 50 μg/l. Groundwater analysis also disclosed the presence of naphthalene at a concentration of 1 μg/l, well below the corresponding ESL for both drinking water and non-drinking water groundwater (17 μg/l and 24 μg/l, respectively).[27] SHC has completed the well sampling and assessed, insofar as was feasible, the volatility of the diesel compounds and the biodegradation factors. SHC also has conducted further soil vapor sampling. This analysis detected concentrations of VOCs that included styrene, dichloroethene (DCE), trichlororethene (TCA), tetrachloroethene (PCE), and Freon-11, which are not typically found in diesel fuel and likely are unrelated to the USTs. Still, concentrations of PCE were measured at 1.63 μg/l about 60 feet south of the two USTs, a concentration that exceeds the corresponding ESL of 0.41 μg/l.[28]

Fuel Leak Sites. USTs are known to have been used in a variety of settings for the purpose of storing petroleum hydrocarbons and waste oils within the SUMC Sites. Pursuant to SCVWD Ordinance 83-2, Section 6.1,[29] the SCVWD implements its statutory role in protecting the water supply by prohibiting the pollution of its water supplies, whether in surface streams, reservoirs, or conduits of any kind, or of groundwater, by any direct or indirect means. The Hoover Pavilion Site is the only site within the SUMC Sites known to have USTs on-site (as explained above under "Hoover Pavilion Site"). A summary description is below.

Stanford University Medical Center (Case # 06S3W03H02f - Open). This site is also known as the Hoover Pavilion Site, located at 211 Quarry Road. Four USTs have been reported in the Hoover

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25 The Environmental Screening Levels (ESLs) are considered to be conservative. Under most circumstances, and within the limitations described, the presence of a chemical in soil, soil gas or groundwater at concentrations below the corresponding ESL can be assumed to not pose a significant, longterm (chronic) threat to human health and the environment. Additional evaluation will generally be necessary at sites where a chemical is present at concentrations above the corresponding ESL. Active remediation may or may not be required depending on site-specific conditions and considerations. The Tier 1 ESLs presented in this section from the lookup tables are NOT regulatory cleanup standards. The presence of a chemical at concentrations in excess of an ESL does not necessarily indicate that adverse impacts to human health or the environment are occurring; this simply indicates that a potential for adverse risk may exist and that additional evaluation is warranted.

26 California Regional Water Quality Control Board San Francisco Bay Region, *Interim Final Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater,* Table C. Environmental Screening Levels (ESLs) Deep Soils (>3m bgs) Groundwater is a Current or Potential Source of Drinking Water and Table D. Environmental Screening Levels (ESLs) Deep Soils (>3m bgs) Groundwater is not a Current or Potential Source of Drinking Water, November 2007, Revised May 2008.

27 California Regional Water Quality Control Board San Francisco Bay Region, *Interim Final Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater,* Table C. Environmental Screening Levels (ESLs) Deep Soils (>3m bgs) Groundwater is a Current or Potential Source of Drinking Water and Table D. Environmental Screening Levels (ESLs) Deep Soils (>3m bgs) Groundwater is not a Current or Potential Source of Drinking Water, November 2007, Revised May 2008.

28 California Regional Water Quality Control Board San Francisco Bay Region, *Interim Final Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater*, Table E. Environmental Screening Levels (ESLs) Indoor Air and Soil Gas (Vapor Intrusion Concerns), Shallow Soil Gas Screening Levels, Residential Land Use, November 2007, Revised May 2008.

29 Santa Clara Valley Water District, NOP Stanford University Medical Center Facilities Renewal and Replacement Project, and Simon Properties-Stanford Shopping Center Expansion, September 28, 2007.

Pavilion Site: two 2,200-gallon USTs (diesel); one 750-gallon UST (primarily diesel); and one 350-gallon UST (waste oil). Please refer to the "Hoover Pavilion Site" section for further description.

Existing Hazardous Waste. Hazardous wastes have been and are currently generated by uses at the Main SUMC Sites. The current types and amounts of hazardous waste generated at the Main SUMC Site are shown in Table 3.12-5. This table provides a summary of the listing of on-site hazardous chemicals from the SUMC Project application.[30] Types of hazardous waste include flammable materials (e.g., solvents), corrosive materials (e.g., acids, bases), toxic materials (e.g., mercury, lead), reactive materials (e.g., aerosols, oxidizers), other hazardous liquids (e.g., oil and water, latex paints), and other hazardous solids (e.g., batteries, lights, ballast). As shown in the table, facilities at the Main SUMC Site currently generate about 61.4 tons of hazardous waste each year. The majority (94.3 percent) generated by the LPCH and SHC.

Table 3.12-5
Non-Biohazard Hazardous Waste Generated at the Main SUMC Site

Type of Waste	Examples	Approximate Volume (tons)
Flammable Materials	Solvents	19.5
Corrosive Materials	Acids, bases	0.5
Toxic Materials	Mercury, lead	0.5
Reactive Materials	Aerosols, oxidizers	0.15
Other Hazardous Liquids	Oil and Water, latex paints	40.0
Other Hazardous Solids	Batteries, lights, ballast	0.7
Total		***61.4***

Source: SUMC, 2010.

No radioactive waste is generated from radioactive hazardous materials listed in Table 3.12-2 since it is allowed to decay for ten half-lives and is then disposed as non-radioactive. This disposal method is specified in Stanford's Radioactive Material License with the State of California. Radioactive materials listed in Table 3.12-4 are normally returned to the manufacturer for recycling or disposal when sources are past their useful life, resulting in a very small quantity as waste. Disposal of all radioactive waste is in accordance with the Hazardous Materials & Waste Management Plan.

A Medical Waste Management Plan is followed by the SHC, the LPCH, and the SoM. This plan includes a comprehensive list of the types of medical waste generated and covers the collection and disposition of medical waste, emergency action plans, and a list of the required training for new employees. About 1,100 tons of biohazardous waste generated by the Main SUMC Site is treated on-site by steam sterilization and about 160 tons are transported to off-site, licensed disposal facilities for incineration (pathological waste, trace chemotherapy waste, pharmaceutical waste).

30 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 7.

Applicable Plans and Regulations

Hazardous materials handling and hazardous waste management are subject to laws and regulations at all levels of government as summarized below. The County Office of Emergency Services (OES)[31] and the PAFD implement and enforce federal, State, and local laws regarding hazardous materials management and emergency planning.[32] The County DEH is the Certified Unified Program Agency (CUPA) for the County of Santa Clara and the City of Palo Alto. The County DEH administers the Hazardous Waste Generator/Tiered Permitting Program (California Health and Safety Code Chapter 6.5), and the Risk Management Program (California Health and Safety Code Chapter 6.95).[33] The PAFD administers the California Fire Code (with local amendments), the Hazardous Materials Storage Ordinance, and the Toxic Gas Ordinance.[34] As a CUPA Participating Agency, the PAFD also administers the following State programs: the Hazardous Materials Business Plans (California Health and Safety Code Chapter 6.95), the Underground Storage Tank Program (California Health and Safety Code Chapter 6.7), and the Aboveground Petroleum Storage Tank Program (California Health and Safety Code Chapter 6.67).[35]

The County DEH protects the health of the community through the enforcement of environmental standards. The Hazardous Materials Compliance Division regulates the disposal and storage of hazardous materials both above and below ground.[36] The California Office of Statewide Health Planning and Development (OSHPD), the Palo Alto Building Division (PABD), and the PAFD implement and enforce State laws regarding building and fire safety.[37] Cal/OSHA and OSHA implement and enforce State and federal laws regarding worker safety. DTSC implements and enforces federal and State laws regarding hazardous waste handling. The Radiologic Health Branch of the California Department of Health Services (CDHS) implements and enforces State and federal laws regarding radioactive materials management. The CDHS Medical Waste Management Program and County Department of Environmental Protection implement and enforce State laws regarding medical waste handling.[38] The U.S. Department of Transportation (DOT), the U.S. Postal Service (USPS), the U.S. Environmental Protection Agency (EPA), the California Highway Patrol (CHP), the California Department of Transportation (Caltrans), and the DTSC implement and enforce State and federal laws regarding hazardous materials transportation. Bay Area Air Quality Management District (BAAQMD), Cal/OSHA, and DTSC implement and enforce state and federal laws regarding hazardous building components. San Francisco Bay RWQCB oversees the groundwater protection program throughout the County.

31 The Santa Clara County Office of Emergency Services website, http://www.sccgov.org/portal/ site/oes/, accessed November 26, 2007.
32 Palo Alto Fire Department, http://www.pafd.org/depts/fir/default.asp, accessed November 26, 2007.
33 UNIDOCS Home Page, http://www.unidocs.org/members/Palo_Alto_Fire.html, accessed November 26, 2007.
34 UNIDOCS Home Page, http://www.unidocs.org/members/Palo_Alto_Fire.html, accessed November 26, 2007.
35 UNIDOCS Home Page, http://www.unidocs.org/members/Palo_Alto_Fire.html, accessed November 26, 2007.
36 The County of Santa Clara, http://www.sccgov.org/, accessed November 26, 2007.
37 Palo Alto Fire Department, http://www.pafd.org/depts/pln/news/default.asp, accessed November 26, 2007.
38 UNIDOCS Home Page, http://www.unidocs.org/members/Palo_Alto_Fire.html, accessed November 26, 2007.

Hazardous Materials Management and Emergency Planning. State and federal laws require that hazardous materials be properly handled, used, stored, and disposed of, and, in the event that such materials are accidentally released, that appropriate measures are taken to prevent or to mitigate injury to human health or the environment. California's Hazardous Materials Release Response Plans and Inventory Law, sometimes called the "Business Plan Act," aims to minimize the potential for accidents involving hazardous materials and to facilitate an appropriate response to possible hazardous materials emergencies. Businesses, including hospitals, that use hazardous materials in quantities that exceed the state-established threshold quantities of 55 gallons for liquids, 500 pounds for solids, and 200 cubic feet at standard temperature and pressure for compressed gases, are required by law to create a Hazardous Materials Business Plan (HMBP). The HMBP is then submitted to the PAFD.[39]

In Santa Clara County, any amount of radioactive materials used or handled by a business requires an HMBP.[40] The HMBP requires inventories of those materials to be provided to designated emergency response agencies, a diagram illustrating where the materials are stored on-site, an emergency response plan, and annual training for the employees' safe use of the materials and safety procedures in the event of a release or threatened release of a hazardous material. If the quantity or type of hazardous materials involved exceeds the thresholds for a 'short form', a HMBP addendum must also be prepared. A HMBP addendum must include a spill prevention plan, an emergency response plan, a description of equipment type and location, an employee training plan, and a closure plan. HMBPs and addendums available for existing uses in the SUMC Sites are kept on file with the PAFD and the County Hazardous Materials Program. This information must be updated within 30 days of a substantial change in operations.[41]

The SUMC Project could increase hazardous materials use and hazardous waste generation due to increased site activity and development, and the range and volume of hazardous materials currently on the site would change due to the expansion of the SUMC. The SUMC has a HMBP on file with the PAFD. The requirement to prepare and maintain an HMBP ensures that the SUMC Project's use of hazardous materials would be within acceptable risk levels and, therefore, that the SUMC Project would not use or produce hazardous materials in a manner that poses substantial hazards to people or to the environment.

Building and Fire Safety. OSHPD enforces the 2007 California Building Code, 2003 Life Safety Code, and 2001 California Fire Code. The PABD and PAFD also enforce the California Building Code and California Fire Code, respectively. These laws specify management practices for flammable materials, including packaging and containment requirements. They also set forth appropriate construction standards (e.g., fire separations and fire suppression systems) depending on building occupancy classifications. The OSHPD, PABD, and PAFD also review proposed building design plans to ensure compliance with the Uniform Building Code and California Fire Code requirements. The new construction and expanded operations at the SUMC Sites would be subject to these requirements.

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39 UNIDOCS Home Page, http://www.unidocs.org/members/Palo_Alto_Fire.html, accessed November 26, 2007.
40 Palo Alto Fire Department website, www.pafd.org/news/displaynews.asp?NewsID=604&TargetID= 172, accessed November 26, 2007.
41 Shannon Ford, Palo Alto Fire Department, personal communication, November 26, 2007.

Worker Safety. Occupational safety standards exist in federal and State laws to minimize worker safety risks from both physical and chemical hazards in the workplace. Cal/OSHA is responsible for developing and enforcing workplace safety standards and assuring worker safety in the handling and use of hazardous materials. Among other requirements, Cal/OSHA obligates many businesses to prepare injury and illness prevention plans and chemical hygiene plans. Cal/OSHA's Hazard Communication Standard requires that workers be informed of the hazards associated with the materials they handle. For example, manufacturers are to appropriately label containers and employers are to make material safety data sheets available in the workplace and properly train workers in the use of hazardous materials.

OSHA's Bloodborne Pathogens Standard mandates the use of universal precautions in the handling of human blood and certain body fluids in the workplace. Each employer with employees who have potential occupational exposure to bloodborne pathogens must annually review and update their Exposure Control Plan. The Exposure Control Plan must implement precautions including providing hand washing facilities; forbidding bending, recapping, or removing contaminated needles or sharps; providing regulation of sharps disposal containers; forbidding the storage or consumption of food/drink, the application of cosmetics, or smoking in work areas where there is a likelihood of occupational exposure; prohibiting mouth suctioning of blood; transporting biohazardous materials according to regulation; provision of personal protective equipment at no cost to employees, including gloves, masks, eye protection, gowns, aprons, and other protective equipment; clean and sanitary maintenance of facilities; provision of the hepatitis B vaccine to employees with risk of occupational exposure; labeling of all containers holding regulated waste; and ensuring all employees participate in occupational exposure training. All of these safety standards and practices regarding workplace safety are contained in and implemented by individual businesses through their HMBPs and Addenda, as described above.

Hazardous Waste Handling. DTSC is authorized to enforce hazardous waste laws and regulations in California. Requirements place responsibility for proper hazardous waste disposal on hazardous waste generators for the lifetime of the hazardous waste, commonly referred to as cradle-to-grave.

All hazardous waste generators must certify that, at a minimum, they make a good faith effort to minimize their waste and use the waste management methods required by law. Hazardous waste laws and regulations are enforced locally by the County DEH.

Radioactive Materials Management. The Radiologic Health Branch of the CDHS administers the federal and State radiation control laws and regulations that govern the storage, use, and transportation of radioactive materials and the disposal of radioactive wastes. The Radiologic Health Branch licenses institutions that use radioactive materials and radiation-producing equipment, such as x-ray equipment. In order to maintain their licenses, institutions such as the facilities at the SUMC must meet training and radiation safety requirements and be subject to routine inspections.

Medical Waste Handling. The CDHS Medical Waste Management Program enforces the California Medical Waste Management Act and related regulations. Medical facilities that generate 200 or more pounds per month of medical waste in any month of a 12-month period are required to implement a

Medical Waste Management Plan, which acts as the Medical Waste Facility Permit application. A Medical Waste Management Plan must be filed with the County DEH, the enforcement and permitting agency, on forms provided by the County DEH, containing but not limited to the name, address, and type of business of the waste generator; the type and estimated monthly quantity of medical waste generated; the type and capacity of medical waste treatment facilities used on-site; the name and address of the registered hazardous waste hauling service; the name and address of the offsite medical waste treatment facility; an emergency action plan complying with CDHS regulations; and a statement certifying that the information provided is complete and accurate. The Medical Waste Management Plan is enforced through an annual certification completed by the medical waste generator and through annual inspections by the PAFD and/or the County DEH.

Medical waste and its disposal are generally regulated in the same manner as hazardous waste, except that special provisions apply to storage, disinfection, containment, and transportation. Medical waste must be stored in closed red bags marked "biohazard" and, when transported for disposal, placed inside hard-walled containers with lids. The law imposes a cradle-to-grave tracking system and a calibration and monitoring system for on-site treatment. Facilities that treat medical waste on-site must obtain a medical waste facility On-site Treatment Facility permit from the County DEH, which is subject to annual audits, and submit a Generator Registration Application (form DHS 8550). The medical waste facility On-site Treatment Facility permit application must contain, but is not limited to, the permit application form (DHS 8667); the capacity and time per operational cycle; the operations schedule; the amount of medical waste expected to be handled during the permit period; the process to be used to treat medical waste; the type of waste to be treated; measures which would prevent unauthorized waste from being treated at the facility; a description of radiation detection devices; a facility site plan depicting medical waste treatment locations; a map of the vicinity; a disclosure statement; a description of security procedures; the general operation plan; the emergency action plan; the training plan; the closure plan; and a description of the monitoring equipment and schedule. The permit is valid for five years, at which point it can be renewed. The County DEH would issue a medical waste facility On-site Treatment Facility permit upon evaluation, inspection, or records review of the application. The permit is issued within 180 days if the application is in substantial compliance with the California Medical Waste Management Act. The permit may condition the handling or treatment of medical waste to protect public health and safety.

The current SUMC Medical Waste Management Plan was revised in March 2007 and includes a comprehensive list of the types of medical waste generated, as well as information on the collection and disposal of medical waste, emergency action plans, and a list of required training regiments for all new employees. With implementation of the SUMC Project, the SUMC Project sponsors would continue to comply with and be subject to the plan.[42]

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42 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 7.

Hazardous Materials Transportation. The United States DOT has developed regulations pertaining to the transport of hazardous materials and hazardous wastes by all modes of transportation. Typical hospital operations could include hazardous materials transport by mail: USPS has developed additional regulations for the transport of hazardous materials by mail; DOT regulations specify packaging requirements for different types of materials; and the EPA has also promulgated regulations for the transport of hazardous wastes. These more stringent requirements include tracking shipments with manifests to ensure that wastes are delivered to their intended destinations. In California, CHP, Caltrans, and DTSC enforce federal hazardous materials transportation requirements. All transportation of hazardous materials to and from the SUMC Sites would be subject to these requirements.

Hazardous Building Components. Structural building components sometimes contain hazardous materials such as asbestos, PCBs, lead, and mercury. Demolition of buildings within the SUMC Sites that contain such materials could disturb these materials and thus expose workers, the public, and the environment to hazardous materials. These materials are subject to regulatory oversight, as described below.

Asbestos. Asbestos is regulated as a hazardous air pollutant and as a potential worker safety hazard. BAAQMD's *Regulation 11* and Cal/OSHA regulations restrict asbestos emissions from demolition and renovation activities and specify safe work practices to minimize the potential for release of asbestos fibers. These regulations prohibit emissions of asbestos from asbestos-related manufacturing, demolition, or construction activities; require medical examinations and monitoring of employees engaged in activities that could disturb asbestos; specify precautions and safe work practices that must be followed to minimize the potential for release of asbestos fibers; and require notice to federal and local government agencies prior to beginning renovation or demolition that could disturb asbestos. California requires licensing and certification through Cal/OSHA of contractors who conduct asbestos abatement activities.

PCBs. DTSC has classified PCBs as a hazardous waste when concentrations exceed 5 parts per million (ppm) in liquids or 50 ppm in non-liquids. Fluorescent light ballasts may contain PCBs, and if so, they are regulated as hazardous waste and must be transported and disposed of or incinerated as hazardous waste. Ballasts manufactured after January 1, 1978 should not contain PCBs and are required to have a label clearly stating that PCBs are not present.

Lead. Cal/OSHA standards establish a maximum safe exposure level for types of construction work where lead exposure may occur, including demolition of structures where materials containing lead are present; removal or encapsulation of materials containing lead; and new construction, alteration, repair, or renovation of structures with materials containing lead. Inspection, testing, and removal of lead-containing building materials must be performed by State-certified contractors who are required to comply with applicable health and safety and hazardous materials regulations. Typically, building materials with only lead-based paint attached are not considered hazardous waste unless the paint is chemically or physically removed from the building debris.

Mercury. Spent fluorescent light tubes, thermostats, and other electrical equipment contain heavy metals that, if disposed of in landfills, can leach into soil or groundwater. Lighting tubes typically contain concentrations of mercury that may exceed regulatory thresholds for hazardous waste and, as such, must be managed in accordance with hazardous waste regulations. Elemental mercury also can be found in many electrical switches, which also must be managed in accordance with hazardous waste regulations.

Emergency Response and Evacuation. Emergency response and evacuation in the City is directed by the Palo Alto Emergency Operations Plan (EOP), which identifies the City's emergency planning, organization, and response policies and procedures. The plan addresses how the City will respond to disaster emergencies, from preparation through recovery. The EOP establishes the policies and structure for City government management of emergencies and disasters and prescribes four phases of emergencies and disasters: Preparedness, Response, Recovery, and Mitigation/Prevention. It assigns responsibilities for actions and tasks that the City will take to help protect the safety of its citizens against natural, technological, and national security emergencies and disasters. In addition, the EOP provides Evacuation Routes maps from the City's Comprehensive Plan.[43]

Impacts and Mitigation Measures

Standards of Significance

Based on significance thresholds determined by the City of Palo Alto, the SUMC Project would result in a significant hazardous materials impact if it would:

- Create a significant hazard to the public or the environment as a result of the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- Construct a school on a property that is subject to hazards from hazardous materials contamination, emissions, or accidental release;
- Create a significant hazard to the public or the environment from existing hazardous materials contamination by exposing future occupants or users of the site to contamination either in excess of soil and groundwater cleanup goals developed for the site or from location on listed hazardous materials sites compiled pursuant to Government Code Section 65962.5;
- Expose people or structures to a significant risk of loss, injury, or death involving wildland fires;

[43] City of Palo Alto, Emergency Operations Plan, June 2007.

- Result in a safety hazard from a public airport for people residing or working within the project area; or
- Impair implementation of or physically interfere with an adopted emergency response or evacuation plan.

Methodology for Analysis

To assess the potential for the SUMC Project to involve the use, production, or disposal of materials in a manner that poses substantial hazards to people, the following analysis considers the pathways through which exposure to hazards could potentially occur, and evaluates the controls that would be placed on each of these pathways. Exposure pathways that would be controlled sufficiently to pose no substantial hazards are considered less-than-significant health and safety issues. This evaluation includes the review of previous ESAs, agency files, and hazardous materials reports that deal directly with facilities located within the SUMC Sites.

Exposure pathways are the means by which hazardous substances move through the environment from a source to a point of contact with people. A complete exposure pathway must have four parts: (1) a source of contamination, (2) a mechanism for transport of a substance from the source to the air, surface water, groundwater, or soil, (3) a point where people come in contact with contaminated air, surface water, groundwater, or soil, and (4) a route of entry into the body. Routes of entry can be eating or drinking contaminated materials, breathing contaminated air, or absorbing contaminants through the skin. Risks can be assessed when an exposure pathway is complete. If any part of an exposure pathway is absent, the pathway is said to be incomplete and no exposure or risk is possible. In some cases, although a pathway is complete, the likelihood that exposure will occur is very small.

Exposure pathways can exist under many different circumstances. Toxic substances can be released from a facility or source of contamination during normal, everyday operations or through leaks, spills, fires, or other accidents. Once released, contaminants can move or be transported through the environment by various means, including surface and groundwater flows.

Environmental Analysis

HM-1. Exposure from Hazardous Materials Use, Handling, and Disposal. The SUMC Project would not substantially increase exposure from hazardous materials use, handling, and disposal during operation. (LTS)

Impacts on Workers and Other Individuals On-Site. The existing and projected amounts of hazardous materials at the SUMC Sites are shown in Table 3.12-6. In addition to the materials described in the table, facilities maintenance activities require various common hazardous materials, including cleaners (which may include solvents and corrosives, in addition to soaps and detergents); paints; pesticides and herbicides; fuels (e.g., diesel); and oils and lubricants.

As shown in Table 3.12-6, the post-construction amounts of hazardous materials at the SUMC Sites would exceed the existing amounts of chemicals and hazardous materials currently

Table 3.12-6[a,b]
Existing and Projected Amounts of Hazardous Chemicals at the SUMC Sites

	Existing Amounts On-site			Projected Amount On-site		
Type of Material	Solids (pounds)	Liquids (gallons)	Gases (cubic feet)	Solids (pounds)	Liquids (gallons)	Gases (cubic feet)
Explosive, Mass Explosion	0.28	0.00	0.00	0.31	0.00	0.00
Explosive, Minor blast	0.02	0.00	0.00	0.02	0.00	0.00
Flammable Gas	102	0.00	6,651	113	0.00	8,305
Non-Flammable, Non-Toxic Gas	3,058	1535	158,783	3,914	1,719	183,024
Flammable Liquids	0.00	2,879	0.00	0.00	3,558	0.00
Flammable Solid	269	0.06	0.00	317	0.07	0.00
Spontaneously Combustible	5.57	0.03	0.00	6.24	0.03	0.00
Water Reactive Flammable	3.74	0.05	0.00	4.19	0.06	0.00
Oxidizers	147	164	0.00	165	190	0.00
Organic Peroxide	1.07	30.2	0.00	1.20	38.6	0.00
Radioactive	0.87	0.00	0.00	0.97	0.00	0.00
Corrosive Materials	375	749	0.00	449	941	0.00
Toxic Materials (solid or liquid)	726	442	0.00	830	554	0.00
Miscellaneous Hazards	5,176	527	0.00	5,797	591	0.00
Moderately Toxic	0.00	2.00	0.00	0.00	2.24	0.00
Slightly Toxic	0.00	31	0.00	0.00	34.7	0.00
Flammable	0.00	31	0.00	0.00	34.7	0.00
Combustible	136	218	0.00	153	244	0.00
Suspect Carcinogen/Mutagen	0.00	33	0.00	0.00	37	0.00
Halogenated Solvent	0.00	2.00	0.00	0.00	2.24	0.00
Skin Irritant	0.00	121	0.00	0.00	136	0.00
Hepotoxin	0.00	2.00	0.00	0.00	2.24	0.00
Nephrotoxin	0.00	2.00	0.00	0.00	2.24	0.00
Neurotoxin	0.00	2.00	0.00	0.00	2.24	0.00
Lung Irritant	0.00	121	0.00	0.00	136	0.00
Eye Irritant	0.00	121	0.00	0.00	136	0.00
California Prop. 65 Carcinogen	0.00	2.00	0.00	0.00	2.24	0.00

Source: SUMC, 2010.

Notes:

a. Some chemicals fall into more than one category; therefore, the columns presented here cannot be added to derive actual totals.

b. This table provides a reasonable estimate of the materials that will be located at SUMC facilities; however, because of the continuing advancements in technology, the list of needed chemicals and quantities may change in the time between this estimate and the opening and ongoing operation of SUMC Project facilities.

on-site. The amount of hazardous materials, as measured by weight, would increase by about 18 percent; the amount of hazardous materials measured by liquid volume would increase by about 19 percent; and the amount of hazardous material measured by gaseous volume would increase by about 9 percent. Overall, there would be a 12 to 30 percent increase in most hazardous materials used and stored on-site.

The risks posed by chemicals used at the SUMC Sites vary depending upon the particular chemical/biohazard. The properties and health effects of different chemicals are unique to each chemical and depend on the extent to which an individual is exposed and how that exposure occurs. As is currently the case, following occupation of the new buildings at the SUMC Sites, exposure to hazardous and biohazardous materials by physicians, staff, patients, and visitors could occur through activities associated with hazardous materials use, handling, storage, and accidental release.

Although the SUMC Project would increase the amount of these materials used or stored at the Main SUMC Site, their transport, storage, and use would be controlled in the same manner as under current conditions. The routes through which SUMC facility employees or others in the immediate vicinity could be exposed include inhalation, ingestion, contact, injection, and other accidents. Control measures to reduce or prevent exposure to hazardous chemical materials and radioactive materials currently exist explicitly in federal and State laws to minimize worker safety risks. Control measures to reduce or prevent exposure to biohazardous materials are incorporated in California law by reference in Sections 25115, 25117, and 25316 of the California Health and Safety Code. Examples of control measures to reduce the risk of exposure of on-site workers and other individuals are presented in Table 3.12-7. These control measures are consistent with occupational safety standards and standard industry practices. They respond to the materials and wastes handling regulations enforced by county, State, and federal agencies through required reporting procedures and site inspections (see Applicable Plans and Regulations, above). The SUMC Project sponsors are, and would continue to be, required by law to comply with the control measures established in the approved HMBPs, license to handle radiological materials, and Medical Waste Facility Permit.

The standard industry practices are established by guidelines from agencies such as the National Research Council and the U.S. Department of Health and Human Services, National Institutes of Health, and Centers for Disease Control. The guidelines are often indirectly required by laws and regulations that incorporate them by reference. The protective equipment and training required by law to be provided to SUMC facilities staff would further reduce potential exposure. The occupational exposure training and personal protective equipment required by OSHA's Bloodborne Pathogens Standard, the training required by the California Medical Waste Management Act, and the training required by California's Hazardous Materials Release Response Plans and Inventory Law all limit the exposure pathway for individuals on or near the SUMC Sites. Compliance with the regulations and industry standards would protect workers and other individuals on-site from exposure to hazardous materials.

Table 3.12-7
Exposure Pathways and Controls – Workers and Other Individuals On-site

Exposure Pathway	Examples of Control Measures
Inhalation (breathing a hazardous substance)	• Working with volatile materials in fume hoods[a] • Working with potentially aerosol-suspended biohazardous materials in biosafety cabinets[b] • Keeping containers closed when not in use • Wearing face masks or respirators, as necessary
Ingestion (swallowing a hazardous substance)	• Not eating or drinking near hazardous materials • Not storing food in refrigerators used for hazardous materials • Not smoking near hazardous materials • Washing hands and work areas
Contact (absorbing a hazardous substance through the skin or eyes)	• Wearing protective clothing and shoes, as necessary • Wearing eye protection (glasses or goggles), as necessary • Wearing gloves, as necessary • Washing hands and work areas • Working with radioactive materials behind shields
Injection (puncturing or cutting the skin with a contaminated object)	• Participating in awareness training • Keeping sharps (e.g. needles, knives, scissors) in puncture-resistant containers
Other Accidents	• Participating in emergency response training[c] • Maintaining emergency equipment (e.g., safety showers, emergency eye washes, first aid kits) • Providing appropriate lips on shelves where hazardous materials are stored and other restraints where necessary[d] • Segregating incompatible hazardous materials and storing flammable materials in fire-rated cabinets • Providing secondary containment for hazardous materials that are not in use • Calling the Palo Alto Fire Department and its Hazardous Materials Emergency Response Team, if necessary

Source: PBS&J, 2008.

Notes:

a. Fume hoods are cabinets with front-opening (usually sliding) glass doors connected to overhead exhaust fans that draw air from the room through the cabinet and expel it into the atmosphere through rooftop stacks.

b. Biosafety cabinets look similar to fume hoods. They filter aerosols and remove particles from the air, but do not necessarily exhaust the filtered air to the outdoors.

c. Training content and methods as required and described by California's Hazardous Materials Release Response Plans and Inventory Law, Cal/OSHA's Communication Standard, OSHA's Bloodborne Pathogens Standard, the licensing requirements of the Radiological Health Branch of the CDHS, the Medical Waste Management Act, and any other applicable laws or regulations.

d. All containers shall be stored using restraining wire or cord, or restraining edges, when open shelving is used.

The County OES regulates the management of hazardous materials, including its storage and use. The County OES inspects hazardous material sites and performs oversight functions pursuant to Division 20 of the State Health and Safety Code. The State Health and Safety Code defines hazardous materials, establishes threshold quantities for regulation, and lists businesses that are exempt from State requirements. All businesses, including hospitals, that use or store quantities that exceed the State's thresholds are required to file a HMBP with the County OES and the PAFD. Also, in Santa Clara County, an HMBP is required for sites that involve the use or handling of any quantity of radioactive material. The SUMC has an HMBP on file with the PAFD. Compliance with the Business Plan Act would ensure that project-related use of hazardous materials would be within acceptable risk levels because of the inventory, reporting, training, and emergency response plan requirements associated with the HMBP and oversight by the County OES. Therefore, project-related activities would not use or produce hazardous materials in a manner that poses substantial hazards to workers and other individuals on-site. As such, impacts from exposure from hazardous materials use, handling, and disposal on the community and the environment on-site would be less than significant.

Impacts on the Surrounding Community and Environment. The health and safety procedures that protect workers and other individuals in the immediate vicinity of hazardous materials would also protect the more distant community and environment. The pathways through which the community or the environment (e.g., local air quality and biota) could be exposed to hazardous materials include air emissions, transport of hazardous materials to or from the site, waste disposal, human contact, and accidents. Table 3.12-8 lists all of the primary means the SUMC Project sponsors would use to protect the community and the environment from exposure to hazardous materials, as required by law, such as California's Hazardous Materials Release Response Plans and Inventory Law, the 2007 California Building Code, the 2003 Life Safety Code, the 2001 California Fire Code, the San Francisco Bay RWQCB's groundwater protection program, Cal/OSHA's Hazard Communication Standard, OSHA's Bloodborne Pathogen Standard, hazardous waste laws and regulations, radiation control laws and regulations, the California Medical Waste Management Act, the DOT hazardous materials transportation regulations, the USPS hazardous materials transportation regulations, the EPA hazardous materials transportation regulations, and the BAAQMD and Cal/OSHA regulations restricting asbestos emissions and specifying safe work practices, as described in the Applicable Plans and Regulations section, above.

Table 3.12-8
Exposure Pathways and Controls – Community and Environment

Exposure Pathway	Examples of Control Measures
Air Emissions	• Using fume hood ventilation or alternative exhaust systems to dilute and subsequently disperse outgoing emissions[a]
Transport to and from the Site	• Following packaging requirements specified by the DOT, USPS, and the CDHS Radiologic Health Branch and Medical Waste Program • Identifying container contents with appropriate labels • Using licensed hazardous waste haulers • Documenting hazardous waste shipments
Waste Disposal	• Training workers[b] • Segregating wastes • Collecting hazardous waste for appropriate disposal • Diluting and treating wastewater from the site • Labeling trash cans • Following federal and State hazardous waste disposal regulations and procedures, including those for hazardous waste manifest documentation
Human Contact	• Identifying container contents with appropriate labels • Training workers[b] • Implementing standard hygiene practices (e.g., wearing protective clothing and gloves when necessary, leaving protective clothing at work, and washing hands and work areas)[c] • Implementing medical surveillance programs to monitor the health of those who work with certain biohazardous materials[c] • Monitoring the exposure of those who work with radioactive materials[c]
Accidents	• Providing emergency response training[b] • Maintaining emergency equipment (e.g., safety showers, emergency eye washes, first aid kits) • Calling the Palo Alto Fire Department and its Hazardous Materials Emergency Response Team, if necessary • Plugging floor drains or providing sumps in areas where relatively large quantities of hazardous waste may be handled[d] • Conducting facility inspections and preventative maintenance

Source: PBS&J, 2008.
Notes:

a. Fume hoods are cabinets with front-opening (usually sliding) glass doors connected to overhead exhaust fans that draw air from the cabinet and expel it into the atmosphere through rooftop stacks.

b. Training content and methods as required and described by California's Hazardous Materials Release Response Plans and Inventory Law, Cal/OSHA's Communication Standard, OSHA's Bloodborne Pathogens Standard, the licensing requirements of the Radiological Health Branch of the CDHS, the Medical Waste Management Act, and any other applicable laws or regulations.

c. These measures would prevent employees from transmitting hazardous materials to the community or into the environment.

d. Floor drains in generator rooms shall be equipped with removable plugs to prevent spills from entering the wastewater sewer. A sump located at the loading dock would minimize the potential for a hazardous materials release to the storm sewers.

The SUMC Project would increase hazardous materials usage and storage on the SUMC Sites. Increased usage and storage would increase risks of human and environmental exposure to hazardous materials. Table 3.12-6 provides the SUMC Project sponsors' estimates of the quantities of hazardous materials that would be stored at the SUMC Sites. In addition to the materials described in the table, facilities maintenance activities require various common hazardous materials, including cleaners (which may include solvents and corrosives, in addition to soaps and detergents); paints; pesticides and herbicides; fuels (e.g., diesel); and oils and lubricants. It is expected that storage of gases and liquids would generally be in small; individual containers of about 5 gallons or less except for diesel fuel storage tanks and compressed gas cylinders. As a result, the quantities anticipated at the SUMC Sites would be sufficiently small that they would fall well below the federal and California Accidental Release Prevention Program (CalARP) regulated State threshold quantities that would trigger the requirements for a Risk Management Plan. The SUMC Project would not be expected to increase the use of these materials to the point that would exceed the threshold quantities identified in Section 112(r)(5) of the federal Clean Air Act (40 CFR section 68.130). Aside from accidents possibly occurring on-site, accidents during waste transport to and from the SUMC Sites could expose the community and the environment to risks at some distance from the SUMC Sites. As projected by the SUMC Project sponsors, medical waste is expected to increase by 38 tons per year, or 24 percent.[44] Currently, the on-site functions transport an estimated 160 tons of waste per year. The amount of non-medical hazardous waste generated would increase by about 16.6 tons, or 27 percent.[45] As noted above, handling and transportation of hazardous materials and waste is highly regulated.

Hazardous waste transporters are subject to both U.S. Department of Transportation (DOT) and USEPA enforcement of the regulations. Consequently, the DOT and USEPA coordinate their efforts, especially at the regional level, to obtain compliance with both the RCRA and Hazardous Materials Transportation Act (HMTA) regulations. Under the authority of Resource Conservation and Recovery Act (RCRA), the USEPA regulates the transportation of hazardous wastes. The USEPA coordinates its transportation ordinances with the requirements of the HMTA and any statutes promulgated by the DOT pursuant to HMTA. The USEPA has set forth these standards applicable to transporters of hazardous wastes in 40 CFR 263. These USEPA standards incorporate and require compliance with the DOT provisions on labeling, marking, placarding, using proper containers, and reporting discharges. The USEPA's adoption of these DOT standards ensures consistency among the requirements and avoids establishing conflicting rules. The DOT's regulations are documented in 49 CFR 171-180 and implemented by the Research and Special Programs Administration (RSPA) within the DOT. In summary, the USEPA is directed by RCRA to establish certain standards for transporters of hazardous materials and to coordinate regulatory activities with the DOT.

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[44] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 7.

[45] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 7.

In accordance with USEPA regulations, a transporter must:

- Comply with the manifest system (a system that ensures the integrity of the shipment from the point of origin to its destination).
- Maintain the appropriate records (signed manifests) for three years.
- Take immediate action to protect human health and the environment (e.g., notify local authorities or initiate interim measures) in the case of a discharge.
- In the event of a hazardous waste discharge, notify the National Response Center and submit a report to the DOT Office of Hazardous Materials Regulations.
- Clean up any discharges to the environment and take any actions required by the appropriate government officials for mitigating the discharge effects on human health and environment.

Transporters of hazardous wastes must also adhere to all of the Federal Motor Carrier Safety Regulations which DOT has adopted under the Motor Carrier Safety Act of 1984. This Act specifies more requisites that apply to the transport vehicle and the driver. Among them are concise specifications for vehicle parts and accessories, such as lighting devices, brakes, glazing and windows, fuel systems, tires, and horns. Additional requirements concerning inspection, repair, and maintenance are enumerated. Special driving and parking rules which relate to hazardous materials transportation are also indicated. Standards for drivers identify minimum qualifications, including physical qualifications, background and character profiles, and pertinent examinations. Also included among these rules are testing requirements for alcohol and controlled substances such as marijuana, cocaine, opiates, amphetamines, and phencyclidine (PCP). Other regulations pertaining to drivers include standards for the driving of vehicles, stopping, fueling, the use of lamps, the reporting of accidents, and the monitoring of a driver's hours of service.

These existing regulations would ensure that the increase in hazardous waste materials would not substantially increase exposure to the community and surrounding environment. Furthermore, in the event of an accident or spill, the SUMC Project would implement its required emergency response plan (as part of the HMBP) in coordination with the PAFD (see Section 3.14, Public Service, for an analysis of SUMC Project impacts on PAFD services).

Hazardous Materials Use and Storage Summary. The SUMC Project would increase the on-site use and handling, disposal, and transport of hazardous materials relative to existing conditions. Regulations such as California's Hazardous Materials Release Response Plans and Inventory Law; the 2007 California Building Code, the 2003 Life Safety Code, the 2001 California Fire Code; the San Francisco Bay RWQCB's groundwater protection program; Cal/OSHA's Hazard Communication Standard; OSHA's Bloodborne Pathogen Standard; hazardous waste laws and regulations; radiation control laws and regulations; the California Medical Waste Management Act; the DOT hazardous materials transportation regulations; the USPS hazardous materials transportation regulations; the EPA hazardous materials transportation regulations; and the BAAQMD and Cal/OSHA regulations restricting emissions and specifying safe work practices would require implementation of the controls summarized in Table 3.12-7 and Table 3.12-8. These mechanisms would minimize the potential for exposure to adverse health or safety effects. Therefore, the SUMC Project would not involve the use, disposal, or transport of materials in a manner that poses substantial hazards to people, animal, or plant populations. Furthermore, the SUMC Project would implement its required emergency response plan (as part of the HMBP) in coordination with the PAFD (see Section 3.14, Public Service, for an analysis of SUMC Project impacts on PAFD services). For these reasons, the SUMC Project would not result in a significant environmental impact related to the increased use, transport, handling, and disposal of hazardous materials.

HM-2. Demolition and Construction-Related Hazardous Materials Disturbance. The SUMC Project could release hazardous materials in existing buildings. (S)

The SUMC Project would require demolition of about 1.2 million square feet of existing buildings, some of which date back to 1953. Because it was common building practice to use materials containing asbestos, PCBs, lead, and mercury in structures built prior to 1981, demolition of the existing buildings (which were built prior to 1981) could disturb these hazardous building materials and, without control measures, the hazardous materials could cause adverse health or safety effects to construction workers, the public, and/or the environment.

If hazardous materials were found upon inspection at levels that require special handling (i.e., any building material containing 0.1 percent asbestos, paint that contains more than 5,000 parts per million of lead, or any building materials known or suspected to contain any amount of PCBs or mercury), the SUMC Project sponsors must manage these materials as required by law and according to federal and State regulations and guidelines, including those of DTSC, BAAQMD, Cal/OSHA, Santa Clara County OES, and any other agency with jurisdiction over these hazardous materials, as described below.

Asbestos poses health hazards only when inhaled; therefore, friable (easily crumbled) asbestos is potentially hazardous if not encapsulated. Non-friable asbestos or encapsulated asbestos does not pose substantial health risks. During building demolition, asbestos fibers (if any are present) could be disturbed, released into the air, and inhaled by construction workers or the public unless proper precautions are taken. There could be asbestos containing materials in these buildings, and though currently those materials are inert, they could be released to the air during demolition activities, subsequently exposing site workers.

BAAQMD's *Regulation 11 – Hazardous Pollutants, Rule 2 – Asbestos Demolition, Renovation, and Manufacturing* establishes an allowable asbestos emissions threshold from asbestos-related demolition or construction activities, and specifies precautions and safe work practices to be followed in order to minimize the potential release of asbestos fibers. A detailed written plan or notification of demolition must be submitted to the Air Pollution Control Officer (APCO) at least 10 business days before the commencement of demolition. This plan must include contact information for the person who conducted the asbestos survey, including the surveyor's applicable Cal/OSHA certification number; a description of demolition methods, work practices, and engineering controls; the amount of regulated-asbestos containing material to be removed; certification that at least one person trained as required by the BAAQMD will supervise the removal described, with the information posted on the SUMC Sites for inspection by the APCO; the waste transporting service to be used; and the site where the waste will be disposed. The APCO at the BAAQMD enforces the regulation through inspection and testing to determine compliance, citations for non-compliance, and through identification of misdemeanors requiring fines or jail sentencing. The purpose of the BAAQMD's *Regulation 11* is to control emissions of asbestos to the atmosphere during demolition, renovation, milling, and manufacturing activities and establish appropriate waste disposal procedures to safeguard workers, the public, and the environment from asbestos emissions.

While compliance with these regulations would protect construction workers and the public from exposure to hazardous materials such as asbestos, potential impacts associated with asbestos could occur if an asbestos survey were not conducted prior to commencement of demolition activities to ensure that control measures are implemented. Thus, potential exposure to asbestos containing materials during building renovation and/or demolition is considered a significant impact.

Building components containing PCBs, lead, or mercury could be found in the buildings proposed to be demolished on the SUMC Sites. In sufficient concentrations, lead and mercury are regulated as hazardous wastes. PCBs, mercury, and lead are regulated under the federal Toxic Substances Control Act of 1976, and Cal/OSHA standards establish a maximum safe exposure level for types of construction work where lead exposure may occur, as described earlier in Applicable Plans and Regulations. Additionally, adherence to applicable health and safety requirements for these substances would ensure that potential exposure impacts from PCBs, lead, and/or mercury are less than significant.

Hazardous materials would be used in varying amounts during construction of the SUMC Project. Products and materials typically used during construction that could contain hazardous substances include paints, solvents, cements, glues, and fuels. As explained in under HM-1, compliance with existing federal, State, and local laws and regulations that are administered and enforced by the County DEH and the PAFD would ensure that potential exposure impacts related to disturbances of hazardous materials would be less than significant.

MITIGATION MEASURE. Implementation of the mitigation measure below would reduce impacts from exposure to asbestos containing materials to a less-than-significant level at the SUMC Sites by ensuring that all asbestos containing materials are identified and removed prior to structural modification and/or demolition. (LTS)

HM-2.1 *Conduct Asbestos Survey at the SUMC Sites.* Prior to building renovation and/or demolition, an asbestos survey shall be performed on all areas of the building anticipated to be demolished and/or renovated. This survey shall be performed by a licensed asbestos abatement contractor. In the event that asbestos is identified in the buildings proposed to be demolished and/or renovated, all asbestos containing materials shall be removed and appropriately disposed of by a licensed asbestos abatement contractor. A site health and safety plan, to ensure worker safety, in compliance with OSHA requirements (8 CCR 5208) shall be developed by the SUMC Project sponsors and in place prior to commencing renovation or demolition work on portions of buildings containing asbestos.

HM-3. Exposure to Contaminated Soil and/or Groundwater During Construction. The SUMC Project could expose construction personnel and public to existing contaminated groundwater and/or soil. (S)

Exposure to hazardous materials could cause various short-term or long-term health effects specific to each chemical present if exposure is of sufficient concentration and duration. Acute effects, which may result from a single exposure, could range from major to minor effects, such as nausea, vomiting, headache, or dizziness. Chronic exposure to hazardous materials could result in systemic damage or damage to specific organs, such as lungs, liver, or kidneys (related to exposure to benzene, a known carcinogen and a common additive to petroleum hydrocarbons). Construction workers would be at the greatest risk of exposure to contaminated soil or groundwater, particularly if the potential for hazardous materials in the soil or groundwater is not identified adequately.

As described previously in this section, four Phase I ESAs, one Phase II ESA, and additional soil vapor and groundwater sampling were completed in order to assess the conditions at the SUMC Sites and identify potential hazardous conditions within the SUMC Project boundary. Specifically, the Phase I ESAs were conducted for specific addresses/sites located within the SUMC Sites (a Phase II ESA was also completed for the 703 Welch Road Site – refer to Existing Conditions section for further information). These locations are:

- Site 1 - 701 Welch Road, in the Main SUMC Site
- Site 2 - 703 Welch Road, in the Main SUMC Site
- Site 3 - 1101 Welch Road, in the Main SUMC Site
- Site 4 – Hoover Pavilion Site

Site 1 - 701 Welch Road. The Phase I ESA Addendum Report for 701 Welch Road recommended a Phase II ESA be performed, which could possibly include sampling and analysis of soil, groundwater, wastewater, and residues on surfaces such as laboratories countertops, fume hoods, sinks, sumps, floors, and drain lines. Based on the age of the buildings, it is possible that asbestos-containing materials could be present. Prior to demolition, an asbestos survey should be conducted.

Site 2 - 703 Welch Road. The Phase I ESA for Site 2 (703 Welch Road) recommended a Phase II ESA to further investigate the soil and wastewater quality. The Phase II ESA concluded that the soil quality within a limited area (4- to 9-square-foot area) near each of four discharge points from the building had been affected by contaminated discharge of wastewater (from the amalgam separators) and recommended the discontinued practice of discharging wastewater from the amalgam separators to the landscape or garden. Such discharge activities were discontinued consistent with this recommendation. The Phase II ESA also recommended that, if the building is demolished, the sanitary sewer line should be inspected for signs of leakage at joints and bends. If the sanitary sewer line is in poor condition or leakage has occurred, collect samples of the surrounding soil. The soils samples should be analyzed for mercury, silver, and pH levels to evaluate whether disposal of wastewater from the dental offices has impacted soil quality.

The SUMC Project at this location would include subsurface excavation during construction activities of the new LPCH Building. If soils contaminated by discharge of wastewater from the amalgam separators were not removed prior to subsurface excavation, then construction workers could be exposed to these contaminated soils during excavation in these areas. This exposure would result in adverse health impacts; therefore, this is considered a significant impact. The SUMC Project sponsors plan to remove contaminated soils at this site prior to excavation activity; however, mitigation is identified to ensure monitoring of completion of site remediation.

Site 3 - 1101 Welch Road. The Phase I ESA for Site 3 reported no major evidence of hazardous materials accidents or spills, and therefore, did not recommended any further soil and/or groundwater testing.

Site 4 – Hoover Pavilion Site. The Phase I ESA for the Hoover Pavilion Site identified features that could potentially affect environmental conditions. These include: two 2,200-gallon USTs (diesel); one 750-gallon UST (primarily diesel); one 350-gallon waste oil UST; a boiler room with sumps; and three oil-filled transformers. The two 2,200-gallon USTs were emptied and closed in-place under a permit with the PAFD. The 750-gallon UST (which was installed in the 1960s under a permit with the PAFD) was removed in 1996, and the 350-gallon waste oil UST was emptied and closed in-place in 1987. According to interviews conducted as part of the Phase I ESA, the boiler room and sump were closed in 2000, and the three oil-filled transformers were removed and replaced with dry type transformers in the mid-1990s.

Quarterly groundwater monitoring was conducted at the Hoover Pavilion Site from 1989 to 2001. The groundwater monitoring reports indicated soil contamination of TPH-D below the site. Groundwater monitoring reports on record[46] concluded that the plume of dissolved-phase hydrocarbons in the diesel range is relatively stable. Per a request from the County DEH on March 2008, groundwater monitoring has now been reinstated at the Hoover Pavilion Site. The latest groundwater data (preliminary data), dated August 2008, indicates that the TPH-D contamination is below Santa Clara County's threshold of 1,000 μg/l. At the Hoover Pavilion

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46 Conor Pacific. 2001. First Quarter 2001 Groundwater Monitoring Report, Hoover Pavilion. April 15.

SITE, results indicated levels of petroleum hydrocarbons at 180 μg/l. Notwithstanding, continual monitoring is needed in order to fully monitor the status of the contamination. This case remains open.

There are several reports that document the aerial extent of contamination, the historic use and storage of hazardous materials and wastes at the Hoover Pavilion Site, and the potential for known soil and groundwater contamination to impact construction personnel and the public due to exposure to contaminated soil and/or groundwater during construction activities. Impacts associated with potential soil and groundwater contamination could be significant.

Undocumented Areas. Undocumented contamination could also be present on the SUMC Site in areas not addressed by a Phase I or Phase II report. During construction activities, contaminated soils or groundwater could be discovered and pose a risk of exposure to workers, the environment, and the community. Disturbance of contaminated soils or groundwater and exposure of persons would be a significant impact.

MITIGATION MEASURES. With implementation of Mitigation Measure HM-3.1 through HM-3.4, below, the significant impact on construction personnel and the public due to exposure to contaminated soil and/or groundwater at the SUMC Sites would be reduced to less-than-significant levels. In addition, Mitigation Measure HW-3.1 in Section 3.11, Hydrology, would require the SUMC Project sponsors to develop a work plan for any unknown contaminated site, which would further reduce the impacts to less than significant. Mitigation Measure HM-3.4 would require specification of measures to prevent hazards from any remediation itself. As such, these would be less-than-significant impacts from any remediation. (LTS)

HM-3.1 *Perform a Phase II ESA for the 701 Welch Site*. A Phase II ESA shall be performed at 701 Welsh Site Building B. The Phase II ESA shall include sampling and analysis of soil, groundwater, wastewater, and residues on surfaces such as laboratories countertops, fume hoods, sinks, sumps, floors, and drain lines. The County DEH and PAFD shall be notified by the Project sponsors if contamination is discovered. If contamination is discovered, the SUMC Project sponsors shall prepare a site remediation assessment that (a) specifies measures to protect workers and the public from exposure to potential site hazards and (b) certifies that the proposed remediation measures would clean up contaminants, dispose of the wastes, and protect public health in accordance with federal, State, and local requirements. Site excavation activities shall not proceed until the site remediation has been approved by the County DEH and implemented by the SUMC Project sponsors. Additionally, the Site Remediation Assessment shall be subject to review and approval by the San Francisco Bay RWQCB. All appropriate agencies shall be notified.

HM-3.2 *Excavate Contaminated Soil from the 703 Welch Site*. For the 4- to 9-square-foot area near every discharge point from the building, soil samples shall be performed and contaminated soil excavated, removed, and transported to an approved disposal facility in compliance with OSHA requirements. The County DEH and the PAFD shall be notified by the SUMC Project sponsors if contamination is encountered during construction.

HM-3.3 *Conduct a Soil Vapor Program at the Hoover Pavilion Site.* A qualified consultant, under the SUMC Project sponsors' direction, shall undertake the following activities:

- Remove all buried underground storage tanks from the property after sheds and storage buildings on the Hoover Pavilion Site have been demolished;
- To the extent necessary, additional soil sampling shall be collected to determine health risks and to develop disposal criteria;
- If warranted based on soil sampling, a human health risk assessment shall be prepared and implemented to determine potential for impacts on construction workers as well as to develop measures to ensure it is safe to redevelop the Hoover Pavilion Site within engineering controls (e.g., SVE or vapor barriers); and
- To the extent required based upon the results of soil sampling and the results of a health risk assessment (if applicable), a Site Health and Safety Plan to ensure worker safety in compliance with OSHA requirements shall be developed by the Project sponsors, and in places prior to commencing work on any contaminated site.

The SUMC Project sponsors shall cooperate with the County DEH to proceed with closure of the Hoover Pavilion Site.

HM-3.4 *Develop a Site Management Plan for the Hoover Pavilion Site.* The SUMC Project sponsors shall prepare a site remediation assessment that (a) specifies measures to protect workers and the public from exposure to potential site hazards, including hazards from remediation itself, and (b) certifies that the proposed remediation measures would clean up contaminants, dispose of the wastes, and protect public health in accordance with federal, State, and local requirements. Site excavation activities shall not proceed until the site remediation has been approved by the County DEH and implemented by the SUMC Project sponsors. Additionally, the Site Remediation Assessment shall be subject to review and approval by the San Francisco Bay RWQCB. All appropriate agencies shall be notified.

HM-4. Hazardous Waste Generation and Disposal Resulting in Increased Exposure Risk. The SUMC Project would not substantially increase exposure risk related to hazardous waste generation. (LTS)

Proper hazardous waste disposal, regardless of the method selected, can affect the environment. Hazardous waste landfills generally leak at some point and occasionally fail.

Waste incinerators release toxic air contaminants into the atmosphere and result in ash that contains unburnable hazardous constituents (such as metals). Most other treatment and recycling methods result in hazardous residuals that must be disposed of as hazardous waste. These residuals usually are incinerated or landfilled. For this reason, the generation and disposal of hazardous waste is considered to be a form of pollution. Because of the expansion of on-site activity, the SUMC Project would result in increased hazardous waste generation.

The regulatory framework described earlier under Applicable Plans and Regulations is administered by DTSC, and the Radiologic Health Branch of the CDHS. The regulations require the use, storage, handling, transportation, and disposal of hazardous materials and hazardous wastes to be maintained at a level that would ensure interruption of the exposure pathway between hazardous substances and the environment. The SUMC Project facilities would be required to have in place and to maintain "cradle-to-grave" procedures to dispose of hazardous wastes properly; would need to comply with the federal and State radiation control laws described above (see Applicable Plans and Regulations); and, because the SUMC Sites would likely generate 200 or more pounds per month[47] of medical waste, would be required to implement a Medical Waste Management Plan. Compliance with these requirements would ensure the exposure pathway would be greatly restricted. Without a complete exposure pathway, impacts from hazardous waste would be less than significant.

Hazardous Chemical Waste. Risk of upset from increased handling, storage, and disposal of hazardous chemical waste at the SUMC Sites would be prevented by using control measures noted above. Additionally, hazardous chemical waste would be removed from the SUMC Site by a contracted service provider in accordance with applicable regulations, as described under Impact HM-1. There are no hazardous chemical waste landfills or incinerators located in the vicinity of the City of Palo Alto; California's hazardous chemical waste generators rely heavily on out-of-state treatment and disposal facilities to meet their disposal needs. No hazardous chemical waste incinerators in California accept waste from third-party generators.

For the SUMC Project, specifically the SHC and LPCH components, the most accurate method for projecting the potential increase of medical hazardous waste is tied to the number of inpatients. Collectively, both facilities are projected to increase inpatient discharges by about 28 percent. Table 3.12-9 shows the type of waste generated by the SHC and LPCH components, the approximate existing waste volume, and the projected wasted volume in tons.[48] Table 3.12-10 shows the types of waste generated by the SoM component, the existing approximate volumes, and the future approximate volume (in tons).[49]

[47] 5.8 tons of hazardous waste per year divided by 12 months equals an average monthly generation of 0.48 tons (about 967 pounds).
[48] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 7.
[49] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 7.

Table 3.12-9
Existing and Future Annual Hazardous Chemical Waste Volumes for SHC and LPCH

Type of waste generated by SHC and LPCH	Examples	Existing Waste Volume (tons)	Future Waste Volume (tons)
Flammable Materials	Solvents	16.5	21.12
Corrosive Materials	Acids, bases	0.4	0.51
Toxic Materials	Mercury, lead	0.3	0.38
Reactive Materials	Aerosols, oxidizers	0.1	0.13
Other Hazardous Liquids	Oil & water, latex Paints	40	51.2
Other Hazardous Solids	Batteries, lights Ballast	0.6	0.77
Total		**57.9**	**74.11**

Source: SUMC, 2010.

Table 3.12-10
Existing and Future Annual Hazardous Chemical Waste Volumes for SoM

Type of waste generated by SoM in GALE buildings	Examples	Existing Approx. Waste Volume (tons)	Future Approx. Waste Volume (tons)
Flammable Materials	Solvents	3	3.4
Corrosive Materials	Acids, bases	0.1	0.1
Toxic Materials	Mercury, lead	0.2	0.2
Reactive Materials	Aerosols, oxidizers	0.05	0.06
Other Hazardous Liquids	Oil & water, latex, paints	Incl. in SHC above	Incl. in SHC above
Other Hazardous Solids	Batteries, lights, ballast	0.1	0.1
Total		**3.5**	**3.9**

Source: SUMC, 2010.

While the total amount of SoM floor area would remain the same, there would be an increased floor area allocated to wet laboratory space within the new FIM buildings. As discussed above, the risk of upset from increased handling, storage, and disposal of hazardous medical waste at the SUMC Sites would be reduced by using control measures noted above. Additionally, hazardous chemical waste would be removed from the SUMC Site by a contracted service provider in accordance with applicable regulations, as described under Impact HM-1. This increase would result in an approximately 12 percent increase in hazardous chemical waste generation.

Radioactive Waste. The Radiologic Health Branch of the CDHS requires dry, long-lived radioactive waste to be disposed of at a low-level radioactive waste landfill. California belongs to the Southwestern Low-Level Radioactive Waste Disposal Compact (Compact), a group of four states that, together, are responsible for disposing of their low-level radioactive waste.

The intent of the Compact is to reduce the amount of low-level radioactive waste produced in the member states and to provide regional disposal facilities sufficient to dispose of the low-level radioactive waste generated within the region, including the member states. The Compact specifies that California will provide a low-level radioactive waste disposal facility for 30 years from when the facility first accepts low-level radioactive waste for disposal. Following this period, the state who is the largest major generator of low-level radioactive waste will host disposal facilities for the next 30 years. Since the early 1980s, California has attempted to construct a low-level radioactive waste disposal facility at Ward Valley, California, to serve the four states. In 1999, the Governor's Advisory Group on Low-Level Radioactive Waste Disposal announced that they "will not consider the Ward Valley site as part of its mission."[50] For this reason, California must rely on an out-of-state disposal facility in Barnwell, South Carolina to accept its low-level radioactive waste. South Carolina decides each year whether it will accept out-of-state radioactive wastes.

The amount of radioactive materials used each month would increase with an increase in the number of machines in the hospital and clinic facilities. The amount of radioactive materials used for the School of Medicine is projected to be 12 percent greater than the current annual usage, due to an increase in the wet laboratory space of 12 percent. The number of Single Photo Emission Computed Tomography machines is expected to remain the same, so there would not be a change in the single isotopes associated with these machines. However, there would be an increase in Positron Emission Tomography (PET) machines (both PET/CT and PET/MRI) from the existing one machine to six machines. PET machines use isotope F-18; as a result, isotope F-18 would increase by a factor of six. However, the post-construction use of radioactive materials at the SUMC Sites would minimally contribute to the demand for radioactive waste landfills because the increase of radioactive material associated with the SUMC Project operations are minimal.

The handling of radioactive waste could result in exposure of workers or other individuals at the SUMC Sites; however, regulations by the CDHS Radiologic Health Branch would protect workers and other individuals on-site from exposure to radioactive waste. Compliance with these regulations would help prevent potential exposure impacts. Therefore, impacts would be considered less than significant.

Medical Waste. The SUMC Sites generate medical wastes typical of other hospitals, surgery centers, and medical clinics in the course of patient care and research. Medical waste includes both biohazard waste (byproducts of biohazardous materials) and sharps (devices capable of cutting or piercing, such as hypodermic needles, razor blades, and broken glass) resulting from the diagnosis, treatment, or immunization of human beings, or similar research.[51]

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[50] Atkinson, Richard C., Chairman of the Governor's Advisory Group on Low-Level Radioactive Waste Disposal, December 1999.

[51] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 7.

Biohazard Materials Treated On-Site. All hospital areas that provide patient care, complete testing and diagnostics, or perform procedures, generate medical wastes (biohazardous waste). Current practice at the SUMC Sites includes collecting biohazardous wastes in red biohazard bags through the hospitals.[52] In addition, general hazardous materials, which include dressings, gauzes, culture dishes, specimens and fluid containers, are treated and sterilized on-site in an autoclave system and then are sent to landfill for disposal. As part of its current operation, SUMC has installed a state-of-the-art autoclave operation which has three chambers that are filled using mechanical equipment. Once proper sterilization has been reached and the cycle has ended, the chambers automatically empty onto a conveyor system which deposits the treated waste directly into a compactor. This feature provides for minimal handling by SUMC staff during treatment phase. Table 3.12-11 summarizes the combined volumes for both hospitals (SHC and LPCH) and the SoM.

Table 3.12-11
Existing and Projected Volumes of Biohazardous Materials Treated at SUMC

Hospital	Existing (tons)	2025 Projected Total
SHC	600	714
LPCH	300	435
SoM	200	207
Total	**1,100**	**1,356**

Source: SUMC, 2010.

For the two hospitals, SHC and LPCH, the most accurate method for the projection of biohazardous materials generation is the correlation with patient census. At full buildout, SHC forecasts that it would generate 714 tons of on-site treated waste per year, representing a 19 percent increase in inpatient discharges. Meanwhile, LPCH forecasts an increase in inpatient discharges by 45 percent at buildout, generating 435 tons of annual on-site treated waste. Therefore, the approximate total amount of biohazardous waste treated on-site would increase from 1,100 tons to 1,356 tons at full buildout. As the data indicates, the tonnage increase of biohazardous materials treated on-site would not be significant relative to the amount of biohazardous waste currently handled at the facility. This increase would result in less-than-significant impacts.

Medical Waste Transported to Off-Site Facilities. Medical waste materials that cannot be treated through steam sterilization (needles, pharmaceutical waste, trace chemotherapy waste and pathological waste), are required to be incinerated and must be transported to licensed incineration facilities. Currently, two vendors assist with the off-site transport and treatment, removing wastes two to three times each week from a central and secured holding area.

52 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 7.

Combined volumes for off-site treated waste for both hospitals (SHC and LPCH) and SoM reach approximately 160 tons annually.[53]

At full buildout, SHC forecasts that it would transport 104 tons waste offsite per year, corresponding to the 19 percent increase in inpatient discharges it projects. LPCH forecasts an increase in inpatient discharges by 45 percent at buildout, generating 64 tons of waste per year. The total tonnage of medical waste transported off-site is expected to equal 198 tons, representing an increase of 38 tons over the existing amount. The approximate breakdown of these totals is presented in Table 3.12-12, below.

Table 3.12-12
Volumes (tons) of Off-Site Treated Waste from the Main SUMC Site

Hospital	Existing (tons)	2025 Projected total (tons)
SHC	87	104
LPCH	44	64
SoM	29	30
Total	**160**	**198**

Source: SUMC, 2007.

Medical waste is generally regulated in the same manner as hazardous waste, except that special provisions apply to storage, disinfection, containment, and transportation. The law imposes a cradle-to-grave tracking system and a calibration and monitoring system for on-site treatment. As mentioned above, medical waste would be stored in closed red bags marked "biohazard" and, when transported for disposal, placed inside hard-walled containers with lids. Facilities that handle medical wastes must obtain permits to do so and would be subject to annual audits. Compliance with these regulations would minimize potential exposure to biohazards. Because handling and disposal of medical wastes is regulated and the increases associated with the SUMC Project would not be substantial, impacts associated with potential for exposure to biohazards would be considered less than significant.

HM-5. Emit Hazardous Emissions or Handle Hazardous Materials Within One-Quarter Mile of a School. The SUMC Project would not emit or handle hazardous materials within one-quarter mile of school. (LTS)

The SUMC Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. No existing K-12 schools are located within one-quarter mile of the SUMC Sites. The closest off-site schools to the SUMC Sites are Palo Alto High School, approximately 0.7 mile

53 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 7.

east of the SUMC Sites, and Addison Elementary School, approximately 1.2 miles northeast. The nearest private schools are Castilleja School, 1.1 miles northeast, and Montessori School, approximately 1.0 mile northeast.

The LPCH includes an on-site school within the facility. This is an existing school within one-quarter mile of the SUMC Sites. As discussed above, implementation of the SUMC Project would increase the amount of hazardous materials used on the SUMC Sites and hazardous waste generated at the SUMC Sites. Regulations and operational practices that minimize hazard risks to this existing facility would continue to ensure that associated risks are not substantially increased. As such, impacts associated with a school within one-quarter mile of the SUMC Sites would be less than significant.

HM-6. Construct a School on a Property that is Subject to Hazards from Hazardous Materials Contamination, Emissions or Accidental Release. The SUMC Project would not construct a school that is subject to hazards from hazardous materials contamination, emissions or accidental release. (NI)

The SUMC Project would not involve school construction. Because there are no schools proposed for construction, no impact would occur.

HM-7. Occur on a Site Included on the Cortese List, a List of Hazardous Materials Sites. The SUMC Project would result in construction of facilities on a site included on the Cortese List. (S)

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies, and developers to comply with CEQA requirements in providing information about the location of hazardous materials release sites. Government Code Section 65962.5, requires the California EPA to develop at least annually an updated Cortese List. The DTSC is responsible for a portion of the information contained in the Cortese List. The Cortese List compiles information on public drinking water wells with detectable levels of contamination; sites selected for remediation; sites with known toxic material; LUST sites; and/or solid waste disposal facilities. The sites for the list are designated by the SWRCB, the Integrated Waste Management Control Board, and DTSC.

The Hoover Pavilion Site (211 and 215 Quarry Road) is listed on the Cortese List. As such, construction at the Hoover Pavilion Site could potentially expose future occupants and the environment to hazardous materials, resulting in a significant impact.

MITIGATION MEASURES. Implementation of Mitigation Measures HM-3.3 and HM-3.4, which involve the implementation of a soil vapor program and development of a site management plan, would reduce the potential for exposure to hazardous materials at the Hoover Pavilion Site to less-than-significant levels. Additionally, compliance with current federal, State and local regulations would help prevent any further exposure to hazardous materials. (LTS)

HM-8. Wildland Fire Risk. The SUMC Project would not expose people or structures to a significant risk of loss, injury, or death involving wildland fires. (NI)

The Comprehensive Plan and the City of Palo Alto EOP[54] have designated fire hazard zones, including areas of wildland fire risk. These areas are located in the foothills in the southwest portion of the City. For the most part, these designations target homes built in the foothills and other areas where there is a potential for wildland fire risk.

The SUMC Sites are located in a flat, urbanized area and therefore would not be located in areas susceptible to significant grass, brush, or tree fires. Furthermore, the SUMC Project would be required to comply with all fire codes and regulations related to emergency services access. The absence of wildland fire hazards means that the SUMC Project would have no impact on this public health and safety risk.

HM-9. Occur on a Site Located Within an Airport Land Use Plan or Within Two Miles of a Public Airport, and Result in a Safety Hazard. The SUMC Project would not be located within an Airport Land Use Plan or within 2 miles of a Public Airport. (NI)

The SUMC Project would increase the number of helicopter trips by one per day. However, the SUMC Sites are not within the jurisdiction of any Airport Land Use Plan (ALUP) or within 2 miles of a public airport. The closest airport to the SUMC Sites is the Palo Alto Airport, approximately 3.3 miles east of the SUMC Sites. The Palo Alto Airport is near the County's northwestern border within the area governed by the Airport Land Use Commission of Santa Clara County. The SUMC Project is not within the corresponding ALUP nor is it within 2 miles of the airport, and thus would not result in an airport safety hazard. As such, no impacts associated with airport operations would occur.

HM-10. Impairment of Emergency Plans. The SUMC Project could impair implementation or physically interfere with an adopted emergency response or evacuation plan. (S)

As described under Applicable Plans and Regulations, the City's EOP is the governing document regarding emergency response and evacuation. The EOP identifies the City's emergency planning, organization, and response procedures and addresses how the City will respond to disaster emergencies, from preparation through recovery. Evacuation Routes maps provided in the EOP and the Comprehensive Plan[55] identify several primary and alternative emergency evacuation routes in the vicinity of the SUMC Sites. The SUMC Project could have significant impacts on emergency access along these routes for the reasons explain below.

According to Figure 3.4-6 in Section 3.4, Transportation, Sand Hill Road, Pasteur Drive, Arboretum Road, El Camino Real, Palm Drive, Campus Drive, Pasteur Drive, Alma Street, and Page Mill Expressway would serve as construction truck routes for the SUMC Project

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54 City of Palo Alto, Emergency Operations Plan, June 2007.
55 City of Palo Alto, Emergency Operations Plan, June 2007, pp. Q-6 – Q-9

during the approximately 12-year construction period. These routes are identified as primary evacuation routes in the EOP and the Comprehensive Plan. Construction traffic could potentially interfere with emergency access along these routes.

Additionally, as discussed in Section 3.15, Utilities, construction of the SUMC Project could involve upgrades to utility infrastructure that serve the SUMC Sites, determined necessary by the City. Wastewater mains serving the SUMC Sites run along Sand Hill Road, Welch Road, Arboretum Road, and Quarry Road. If any collection and pipeline system upgrades would be needed to serve the SUMC Project, the SUMC Project sponsors would be responsible for construction or providing funding for those system upgrades. The upgrades would occur prior to SUMC Project operation, and during the construction period. Sand Hill Road and Arboretum Road are primary evacuation routes, and utility upgrade work and associated lane closures along these routes could temporarily interfere with the City's emergency evacuation plan.

In addition, as discussed in more detail in Section 3.4, Transportation, operation of the SUMC Project would impair existing emergency response or evacuation routes. Operation of the SUMC Project would increase vehicular travel within the City and would degrade the level of service (LOS) at several intersections. The intersections that would be impacted by the SUMC Project and that are also designated as primary evacuation routes include El Camino Real/University Avenue-Palm Drive, El Camino Real/Page Mill Road-Oregon, Sand Hill Road/Santa Cruz Avenue, Arboretum Road/Galvez Street, El Camino Real/Ravenswood Avenue, Middlefield Road/Willow Road, Middlefield Road/Lytton Avenue, Junipero Serra Boulevard/Page Mill Road, Junipero Serra Boulevard/Campus Drive West, and Middlefield Road/Ravenswood Avenue. In addition, the SUMC Project would further degrade LOS at Alpine Road/I-280 NB Off-Ramp, which is designated as an alternate evacuation route. Due to additional traffic congestion associated with the SUMC Project at these intersections, travel time by emergency vehicles would increase. Any intersection significantly impacted in terms of LOS or increase in vehicle delay, as shown in Table 3.4-17 in Section 3.4, Transportation, would result in the interference of emergency vehicle access and/or and emergency evacuation route, resulting in a significant impact.

MITIGATION MEASURES. Mitigation Measure HM-10.1 requires advance coordination with the City of Palo Alto on construction routes or roadway closures. This measure, together with Mitigation Measures TR-1.1, TR-1.4 through TR-1.6, and TR-1.8, which all involve construction-period traffic controls (see Section 3.4, Transportation), would reduce the significant construction-period impacts to a less-than-significant level. Mitigation Measure TR-9.1, also presented in Section 3.4, Transportation, would involve the installation of emergency vehicle traffic signal priority (OptiCom) at all intersections significantly impacted by the SUMC Project. Mitigation Measure TR-9.1 would reduce impacts on emergency access during operation. Implementation of these measures would reduce the SUMC Project's impact to emergency evacuation and response plans to a less-than-significant level. (LTS)

HM-10.1 Coordinate Construction Activities with the City of Palo Alto. The SUMC Project sponsors shall provide to the City planned construction routes, roadway closures, and access and closures schedules. This information shall be provided to the City at least two weeks in advance of the planned access and closures. The City shall coordinate this information among affected emergency service providers, including the City's Fire and Police Departments, and private ambulance services, so that alternative routes could be planned and announced prior to the scheduled access and closures, as deemed necessary by the City.

Cumulative Analysis

The geographic context for cumulative handling and transport of hazardous materials, and exposure of schools to hazardous substances, and release of toxic materials and contaminated soils during construction includes the SUMC Sites and adjacent parcels.

Additionally, the cumulative analysis below focuses on those impacts for which the SUMC Project would have a less-than-significant or significant impact, as determined previously in this section. For those areas where the SUMC Project would have no impact, the SUMC Project would have no potential to contribute to cumulative impacts. As discussed above, the SUMC Project would have no impacts related to construction of schools on contaminated property, hazards from wildland fires, or on airport operations.

HM-11. Cumulative Handling, Storage, Disposal, and Transport of Hazardous Materials. Cumulative development would increase handling, storage, disposal, and transport within the SUMC Sites and adjacent areas. However, cumulative development would be subject to applicable federal, State, and local regulations that would govern these activities. As a result, the cumulative impact would be less than significant. (LTS)

Reasonably foreseeable probable future development in the SUMC Sites and adjacent areas includes (1) approved but unconstructed development under the Stanford University Community Plan and General Use Permit (CP/GUP), which would include additional academic facilities, housing units, parking, and associated utilities, roadways and bikeways in the adjacent Stanford University property; and (2) demolition of existing structures and construction of a three-story medical office building at 777 Welch Road.

As shown in Appendix B, the 777 Welch Road project would be within close proximity to the Main SUMC Site. The 777 Welch Road project would replace an existing medical building with an expanded medial building. The increase in floor area under the 777 Welch Road project would be about 25,000 square feet. Because that project involves expansion of an existing medical use, it can be assumed that hazardous substances are handled and stored on that site, and that an increase in handling and storage would occur under that project. The 777 Welch Road project and the SUMC Project are almost adjacent to each other, and both would transport hazardous materials along the same routes, such as Welch Road. However, both projects would be subject to the laws and regulations that apply to the storage, handling, and disposal of hazardous materials, as described in Impact HM-1. Laws and regulations pertaining to the handling, storage, and disposal of hazardous materials include hazardous materials management by the County OES, pursuant to the State Health and Safety Code; complying with California's Hazardous Materials Release Response Plans and Inventory Law by filing an HMBP with the County OES and the PAFD if a business uses or stores quantities of hazardous materials that exceed the State's thresholds; filing a Risk Management Plan if handling certain very hazardous substances in excess of State thresholds, as required by the CalARP Program and federal law; complying with the 2007 California Building Code; complying with the 2003 Life Safety Code; complying with the 2001 California Fire Code; complying with San Francisco Bay RWQCB's groundwater protection program; complying with Cal/OSHA's Hazard Communication Standard; complying with OSHA's Bloodborne Pathogen Standard; and complying with the California Medical Waste Management Act. Additionally, the transportation of hazardous materials is addressed by existing regulatory requirements including packaging requirements for hazardous materials and wastes established by DOT, USPS, and EPA to minimize the potential consequences of possible accidents during transport. The vehicle accident rate in California is relatively low compared to other states and not all accidents release hazardous materials.[56]

The Stanford University Community Plan and General Use Permit (CP/GUP) includes additional academic facilities, housing units, parking, and associated utilities, roadways and bikeways in the adjacent Stanford University property. Increased academic uses could involve increased handling of hazardous materials in areas adjacent to the Main SUMC Site. However, the EIR for the CP/GUP identified mitigation involving a Risk Management Plan that would minimize potential for release and exposure of persons to hazardous substances.

As such, cumulative impacts related to hazardous materials use, storage, and handling would be less than significant.

HM-12. Cumulative Disturbance of Hazardous Materials from Construction. The SUMC Project and adjacent development could result in cumulative release of hazardous materials during construction, a significant cumulative impact. The SUMC Project's contribution to the cumulative impact would be considerable. (S)

Many buildings in northwest Palo Alto were built prior to 1981, when it was common building practice to use materials containing asbestos, PCBs, lead, and mercury in structures. Appendix B indicates that the 777 Welch Road demolition would occur almost adjacent to the Main SUMC Site. Release of hazardous materials from demolition of the existing 777 Welch Road structure occur and cumulate with potential release of hazardous materials during demolition of the SUMC structures. Implementation of unconstructed project sunder the CP/GUP would result in less-than-significant risk due to the required Risk Management Plan and ongoing practices to minimize risk. As such, the cumulative impacts could be significant. Because of

[56] California Department of Transportation, 1996 Accident Data on California State Highways (Road Miles, Travel, Accidents, Accident Rates), 1997.

the extensive demolition activities as the Main SUMC Site, the SUMC Project would have a considerable contribution to the cumulative impact.

MITIGATION MEASURE. Mitigation Measure HM-2.1, involving measures to reduce exposure of persons to hazardous materials (such as asbestos), would reduce the SUMC Project's contribution to a less-than-significant level. (LTS)

HM-13. Cumulative Exposure to Contaminated Soil and/or Groundwater, and from Cortese List Sites. The SUMC Project and adjacent development could result in cumulative disturbance of contaminated soils, release of hazardous materials during construction, a significant cumulative impact. The SUMC Project's contribution to the cumulative impact would be considerable. (S)

According to the EDR report, there have been known cases of soils contamination on sites along Welch Road and within the Stanford Shopping Center, almost adjacent to the SUMC Sites.[57] Also, as noted on the SWRCB Geotracker website,[58] several hazardous materials sites exist within the vicinity of the SUMC Sites and foreseeable project locations. Some hazardous sites have been remediated or closed; others are currently being monitored or remediated. Appendix B indicates that the 777 Welch Road project, which would replace an existing medical building with an expanded medial building, would occur almost adjacent to the Main SUMC Site. It is possible that soils at or immediately around the 777 Welch Road site are contaminated and would be disturbed during construction activities for that project. The SUMC Project could disturb contaminated soils at the 703 Welch Road site. Potential release of contaminated soils or groundwater from both the 777 Welch Road project and the SUMC Project could cumulate. As such, the cumulative impacts could be significant. Because of the extensive excavation and general construction activities as the Main SUMC Site, the SUMC Project would have a considerable contribution to the cumulative impact.

MITIGATION MEASURES. Mitigation Measure HM-3.2, which involves remediation of known site contamination at the 703 Welch Road site, would reduce the SUMC Project's contribution to the cumulative impact to less than considerable. Also, Mitigation Measures HM-3.1, HM-3.3, and HM-3.4, involving investigations at other SUMC areas and preparation of the Site Management Plan for remediation activities, would further ensure that any other risks associated with the SUMC Project would be less than cumulatively considerable. (LTS)

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57 Environmental Data Resources, Inc, Database Search Inquire # 2059906.1s, October 24, 2004. The EDR report is available upon request at the City of Palo Alto Planning and Community Environment Department, the contact information or which is provided in Section 1, Introduction, of this EIR.

58 State Water Resources Control Board, GeoTracker, accessed at http://geotracker.swrcb.ca.gov/

HM-14. Cumulative Exposure of Schools to Hazardous Materials and Waste. The SUMC Project, in combination with reasonably foreseeable probable future development, would have a less than cumulatively considerable impact on exposure of schools to hazardous materials. (LTS)

Within Palo Alto, other foreseeable projects that could potentially contribute to increased cumulative exposure of schools to hazardous materials include a skilled nursing/assisted living facility (850 Webster Street), a pump station (2027 E Bayshore Road), a medical facility (777 Welch Road), a medical/dental office (49 Wells Avenue), and a research and development office/apartments (195 Page Mill Road), and construction of the HST tracks. Construction of foreseeable development under the CP/GUP could also contribute to exposure of school occupants to hazards. It is possible that cumulative development would increase use and handling of hazardous materials within one-quarter mile of Palo Alto High School, Addison Elementary School, Castilleja School, and Montessori School. However, cumulative projects would be subject to regulations on the use, handling, storage, and transport of hazardous materials, which would minimize potential risk to schools. Implementation of unconstructed project sunder the CP/GUP would result in less-than-significant risk due to the required Risk Management Plan and ongoing practices to minimize risk. As such, the potential cumulative impact on schools would be less than significant.

HM-15. Cumulative Impairment of Emergency Plans. Cumulative development could impair implementation or physically interfere with an adopted emergency response or evacuation plan. The SUMC Project's contribution to the cumulative impact would be considerable. (S)

As shown in Appendix B, the majority of reasonably foreseeable projects in the City are located along designated emergency evacuation routes. In particular, there are several reasonably foreseeable projects along El Camino Real, Page Mill Road, and in the vicinity of University Avenue. Construction of these projects could involve increased intersection delays due to construction vehicles, road blockages, and lane closures of the evacuation and emergency response routes. Completion of the CP/GUP development could also increase construction vehicle access along these routes. As such, cumulative construction-period impacts on emergency access would be significant. (Cumulative intersection impacts identified in Impact HM-10 already capture cumulative traffic growth are not further addressed here.)

The SUMC Project would be the largest and lengthiest construction within its vicinity. Therefore, the SUMC Project's contribution to the cumulative impact on emergency response and evacuation plans would be cumulatively considerable.

MITIGATION MEASURES. Mitigation Measures HM-10.1, above, and TR-1.1, TR-1.4 through TR-1.6, and TR-1.8, presented in Section 3.4, Transportation, would reduce the SUMC Project's contribution to cumulative impacts on emergency evacuation and response plans to less than cumulatively considerable. (LTS)

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3.13 POPULATION AND HOUSING

Introduction

This section documents current and forecasted population, housing, and employment statistics in the Bay Area region and City of Palo Alto, and estimates how the SUMC Project would fit within or exceed the current and forecasted statistics. The Bay Area region encompasses the nine counties that are within the planning jurisdiction of the Association of Bay Area Governments of the San Francisco Bay region (ABAG); these counties include the counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara (in which the City of Palo Alto is located), Solano, and Sonoma. The large extent of population, employment, and housing impacts from the SUMC Project would be limited to the Bay Area region. Impacts are examined both in the context of the Bay Area region and in the context of the City's sphere of influence. In the regional context, this analysis examines whether or not the SUMC Project would contribute to employment and population growth so that existing regional population and housing forecasts would be exceeded. ABAG is the San Francisco Bay Area's regional council of governments. ABAG forecasts a certain amount of population growth through its projections, and subsequently coordinates with various agencies and municipalities the required housing stock and infrastructure to support the projected growth. A significant impact would occur if the SUMC Project would result in population growth that would exceed the regional forecasts because such growth could undermine the planned housing stock and infrastructure within the region, and result in the need for further development that would result in additional environmental impacts, such as, but not limited to increased traffic, traffic-generated air quality and noise concerns, and increased demands on public services and utilities.

It should be noted that commercial, institutional, or other job-creating growth, by itself, is not deemed to create an impact in relation to population and housing growth. Some areas of the City are zoned for additional non-residential development, and such development (together with the jobs that are created as a result of such development) have been anticipated in the City's and ABAG's regional forecasts. The real question for this section to address is the extent to which the SUMC Project would foster population growth that exceeds these regional projections. Those regional projections were based upon the growth allowed under the City's Comprehensive Plan and zoning ordinances, but the SUMC Project proposes amending the Comprehensive Plan and zoning to significantly increase the amount of non-residential growth beyond what was contemplated for the SUMC Sites. This section analyzes the impacts of that previously unanticipated growth on population and housing, both within the City and in the surrounding region.

In the local context of the City's sphere of influence, this analysis examines whether or not the SUMC Project would increase the City's jobs to employed residents ratio by at least 0.01. The City's jobs to employed residents ratio provides a gauge of the City's ability to provide housing to support the jobs within the City's sphere of influence. A high ratio indicates that more Palo Alto workers live outside the City than within the City, and thus must commute into the City on each workday. Because the current development pattern in the region is auto-dependent,[1] it can reasonably be assumed that a majority of those who work in the City, but live outside the City, travel by car. These vehicle work trips result in vehicle miles traveled, increased traffic congestion within inter-jurisdictional roadways, and vehicular air and noise emissions. It can also reasonably be foreseen that an increase in the current jobs to employed residents ratio correlates to increased vehicle miles traveled, increased traffic congestion within inter-jurisdictional roadways, and increased vehicular air and noise emissions.

The above notwithstanding, demographic changes in population and employment that would result from development of the SUMC Project are not intrinsically physical environmental impacts. However, environmental effects associated with increased population or daytime employment, such as increased traffic, traffic-generated air quality and noise concerns, increased demands on public services and utilities, and growth inducement, could result from population growth. The environmental impacts associated with population growth are addressed separately in various sections of this EIR, and it is not the purpose of this section to repeat any of that other analysis. Rather, this section separately and directly considers population and housing impacts to ensure that all housing-related environmental impacts of SUMC Project growth, as well as ways to mitigate or avoid such impacts, are fully analyzed. Given the high land costs in the region and Palo Alto in particular, lower wage earners typically commute longer distances than higher wage earners, and effective housing programs thus target lower wage earners and/or encourage denser housing near transit. Mitigation for additional housing demand associated with impacts on the City's jobs to employed residents ratio may include one or a combination of payment of a housing fee, construction of housing, and land dedication for housing.

This section incorporates a Housing Needs Analysis prepared by Keyser Marston Associates (KMA; provided as Appendix K),[2] ABAG Projections 2005,[3] 2000 U.S. Census data,[4] applicable policies from the *City of Palo Alto Comprehensive Plan*,[5] and the application for the SUMC Project.[6] The Housing Needs Analysis identifies increases in employment from the SUMC Project, determines the induced housing demand from the increased employment, and distributes the housing demand according to affordability. Also, ABAG Projections 2005 are used here to compare future population and employment growth from the SUMC Project. Projections 2005 are applied in lieu of the more recent ABAG Projections 2007 because both the City's and the VTA's traffic model data were based on the ABAG Projections 2005 and the City has determined that the ABAG Projections 2005 are more consistent with the City's current Comprehensive Plan's goals and policies. In addition, the City has disputed the 2007 ABAG Population and Households projections as aggressive in comparison with the ABAG Projections 2005. The ABAG projections of 2005 and 2007 are similar through the year 2020.

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1 ABAG, *A Place to Call Home: Housing in the San Francisco Bay Area*, pp. 2 and 5, June 2007.

2 Keyser Marston Associates, Inc., Final Proposed Stanford University Medical Center Expansion Housing Needs Analysis, prepared for the City of Palo Alto, September 2009.

3 Association of Bay Area Governments, *Projections 2005: Forecasts for the San Francisco Bay Area to the Year 2030*, 2004.

4 United States Census Bureau, Census 2000, 2001.

5 City of Palo Alto, Comprehensive Plan, 2002.

6 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended.

Additionally, the City of Palo Alto is currently updating its Comprehensive Plan to cover the planning period through 2020. The purpose of the Comprehensive Plan update is to extend the horizon year of the existing Comprehensive Plan adopted in 1998 from 2010 to 2020, revise base conditions and growth projections, modify policies and programs, update the City's land use map, and revise the Housing Element. Once complete, the updated Comprehensive Plan will serve as the guide for Palo Alto's future development. However, as of the preparation of this EIR, the City has not finalized its growth projections to be used in its Comprehensive Plan update process.

Population, employment, and housing issues identified in response to the NOP and during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project were considered in preparing this analysis. Comments requested identification of the number and types of housing demand (by affordability level) from employment, a discussion of increased employment, and a discussion of effects on the City's existing jobs to housing ratio.

Existing Conditions

Population

In 2005, the population in the Bay Area region was slightly over 7 million, as shown in Table 3.13-1. The regional population is expected to reach about 7.4 million in 2010. By 2025, the population in the Bay Area region is projected to reach 8.4 million, which equates to an increase of 18.7 percent over the 20-year period (2005 to 2025). The population in Santa Clara County is expected to grow by 24 percent from approximately 1.7 million in 2005 to 2.2 million in 2025.[7]

The City of Palo Alto's population has grown relatively slowly over the past 30 years. From 2005 to 2010, the population within the City's sphere of influence grew by almost six percent, from 74,000 to 78,300.[8] ABAG projects that the City would experience stronger growth in the future. According to ABAG, the population within Palo Alto's sphere of influence, including portions of the Stanford University campus, would increase by approximately 20 percent between 2005 and 2025, from 74,000 to 89,100 people.[9] This population growth rate would be lower than Santa Clara County's overall projected population growth rate of 24 percent between 2005 and 2025, but slightly higher than the regional growth rate of 18.7 percent. Table 3.13-1 presents current and projected population information for the Bay Area region, Santa Clara County, and the City's sphere of influence.[10]

7 ABAG Projections 2005, 2004.
8 ABAG Projections 2005, 2004.
9 The ABAG population projections are based on an extensive analysis of regional economic and demographic conditions, while also considering local development policies.
10 The Palo Alto sphere of influence includes portions of the Stanford University campus and unincorporated areas of San Mateo County. The sphere of influence is designated by the Santa Clara County Local Area Formation Commission (LAFCO).

Table 3.13-1 Population Trends, 2005–2025					
	2005	**2010**	**2015**	**2025**	**Growth 2005-2025**
Bay Area Region	7,091,700	7,419,600	7,749,100	8,419,100	1,327,400 (18.7%)
Santa Clara County	1,750,000	1,855,500	1,959,100	2,165,800	415,800 (23.8%)
City of Palo Alto (Sphere of Influence)	74,000	78,300	82,900	89,100	15,100 (20.4%)

Source: ABAG, Projections 2005, 2004.

Housing

The number of housing units and households[11] within the Bay Area region has increased significantly since the 1960s and growth is predicted to continue through 2025.[12] As shown in Table 3.13-2, the number of households are projected to increase from approximately 2.6 million in 2005 to 3 million in 2025, for a total growth rate of 18.5 percent. Comparatively, the number of households in Santa Clara County is anticipated to increase by almost 22 percent over the same 20-year period, resulting in a higher average growth rate than the rest of the Bay Area region.

Table 3.13-2 Household Growth, 2005–2025					
	2005	**2010**	**2015**	**2025**	**Growth 2005-2025**
Bay Area Region	2,582,980	2,697,600	2,818,610	3,060,340	477,360 (18.5%)
Santa Clara County	595,550	628,670	660,850	725,090	129,540 (21.8%)
City of Palo Alto (Sphere of Influence)	29,620	31,380	33,150	35,650	6,030 (20.4%)

Source: ABAG, Projections 2005, 2004.

ABAG predicts that the City would experience a growth of 6,030 households (from 29,620 households to 35,650 households) within its sphere of influence between 2005 and 2025, representing a growth rate of approximately 20 percent, which is a lesser growth rate than that of Santa Clara County and a greater growth rate than that of the region.

11 ABAG defines a "household" as: "… another term for an occupied dwelling unit. A household includes all persons who occupy a housing unit. A housing unit is a group of rooms or a single room occupied as separate living quarters where occupants live separately from other persons in the building and have direct access from outside the building or through a common hall. A household can include more than one family." Source: ABAG Projections 2005, 2004, page 33.

12 ABAG Projections 2005, 2004.

Approximately one third of housing units in Palo Alto were built during the 1950s, which was the period of greatest housing construction in the history of the City. Since that time, the rate of housing construction has generally declined. From 1970 to 1980, for instance, homes were added at a rate of about 240 units per year. By the 1990s, the construction rate had decreased even further, to less than 50 dwellings per year.[13]

California's Housing Element law (Government Code 65580 et seq.) requires regional councils of governments to distribute the regional housing need (periodically identified by the State) to each city and county within the applicable region. ABAG identified 2,860 units (defined by income category) as Palo Alto's fair share of the regional housing need, or the Regional Housing Needs Allocation (RHNA) for the 2007 to 2014 period (Table 3.13-3). Of the allocated units, 1,874 are for very low- to moderate-income brackets and 986 are for above moderate-income brackets. As of 2008, the City has issued 150 building permits for very low- to moderate-income (affordable) housing units and 591 building permits for above moderate-income units. Given that these units have been built, they no longer need to be planned for in the Housing Element of the City's Comprehensive Plan. However, sites for an additional 1,724 very low- to moderate-income units and 395 above moderate-income units would need to be identified in the Housing Element of the City's Comprehensive Plan to meet the RHNA for the 2007 to 2014 period. Issuance of building permits for several pending housing projects could further reduce the City's RHNA prior to approval of the Housing Element. As indicated previously, the City of Palo Alto is currently updating the Housing Element through 2020 in a process parallel to the Comprehensive Plan update.[14] The goal is to complete the Comprehensive Plan update, including the revised Housing Element, by 2012.

Table 3.13-3
ABAG Regional Housing Need Allocation for Palo Alto, 2007-2014

Income Level	2007-2014 Need	Building Permits Issued 2007-Present	Unmet Need
Very Low[a]	690	57	633
Low[b]	543	2	541
Moderate[c]	641	91	550
Subtotal of Affordable Units	*1,874*	*150*	*1,724*
Above Moderate[d]	986	591	395
Total	**2,860**	**741**	**2,119**

Sources: ABAG, 2008. San Francisco Bay Area Housing Needs Plan: 2007-2014; and City of Palo Alto, 2008.
Notes:
a. Very Low: Households with incomes between 0 and 50 percent of County median family income.
b. Low: Households with incomes between 51 and 80 percent of County median family income.
c. Moderate: Households with incomes between 81 and 120 percent of County median family income.
d. Above Moderate: Households with incomes greater than 120 percent of County median family income.

13 City of Palo Alto, Comprehensive Plan, Chapter 4, Updated Housing Element, 2002.
14 City of Palo Alto, Comprehensive Plan Amendment, "Housing Element," accessed at: http://www.paloaltocompplan2020.org/content/housing-element, accessed on January 26, 2010.

In past Housing Elements, not all of the RHNA housing assigned to the City, particularly housing in lower income brackets, has been permitted or constructed. For the 1999 to 2006 period, the City issued 341 construction permits for affordable housing units.[15] This number of permits represented 47 percent of ABAG's allocated fair share of 724 affordable housing units for Palo Alto for this period. The City issued permits for 60 percent of the allocated units for very low income housing, 100 percent of the allocated low-income housing units, and 15 percent of the allocated moderate-income housing units.[16]

Employment

As shown in Table 3.13-4, employment within the Bay Area region is projected to increase from approximately 3.5 million in 2005 to approximately 4.8 million in 2025, for a total growth of 36.2 percent. In comparison, the number of jobs in Santa Clara County is expected to grow by 38.2 percent over the same 20-year period, which reflects a similar growth pattern as the region.

Table 3.13-4
Employment Growth, 2005–2025 (Total Number of Jobs)

	2005	2010	2015	2025	Growth (2005-2025)
Bay Area Region	3,516,960	3,836,540	4,147,250	4,788,330	1,271,370 (36.2%)
Santa Clara County	903,840	992,420	1,077,050	1,249,090	345,250 (38.2%)
City of Palo Alto (Sphere of Influence)	99,350	102,190	104,430	112,560	13,210 (13.3%)

Sources: ABAG, Projections 2005.

Major employers in the City of Palo Alto include the City government, SHC, LPCH, CPI, Hewlett-Packard Company, Space Systems Loral, TIBCO Software, Inc., Varian Medical Systems, Inc., Veteran's Affairs Palo Alto Health Care Systems, and Wilson, Sonsini, Goodrich & Rosati. Each of these institutions, companies, and agencies employ at least 800 people.[17] As shown in Table 3.13-4, employment within the City's sphere of influence is expected to increase by approximately 13.3 percent between 2005 and 2025, from 99,350 to 112,560 jobs.[18] Most of this increase is expected to occur in health, education, and service industries.[19] For comparison, the Bay Area region and Santa Clara County are projected to have a total job growth rate of almost three times that of Palo Alto during the same time period.

Jobs to Employed Residents Ratio. The City's jobs to employed residents ratio provides a gauge of the City's ability to provide housing to support the jobs within the City's sphere of influence. The jobs to employed residents ratio is a more accurate gauge compared to the jobs to housing ratio because the

15 City of Palo Alto staff, 2009.
16 City of Palo Alto staff, 2009.
17 City of Palo Alto, "Palo Alto by the Numbers," accessed at www.paloaltoonline.com/com_info/by_the_numbers.php, accessed on January 27, 2010.
18 ABAG Projections 2005, 2004.
19 *City of Palo Alto Comprehensive Plan*, Chapter 7, Business and Economics, 1998.

former excludes housing units that do not house workers (such as housing units that house seniors, students, or those on public assistance).

Table 3.13-5 shows the projected jobs to employed residents ratio within the City's sphere of influence. In 2005, Palo Alto had 3.11 jobs per employed resident within its sphere of influence. This ratio is predicted to improve within the City's sphere of influence over time, to approximately 2.61 jobs per employed resident in 2025. The higher number of jobs versus employed residents means that the City has a substantially larger employee population, most of who would be within the City sphere of influence in the daytime. These ratios do not take into account whether the skills of local workers coincide with local job requirements; whether the salaries paid to the workers enable them to live in the community where they work; or whether there are personal and life choices influencing why workers do not live where they work.

Table 3.13-5
City of Palo Alto Jobs to Employed Residents Ratio

	2005	2010	2015	2025
Jobs	99,350	102,190	104,430	112,560
Employed Residents	31,990	34,930	38,090	43,160
Jobs to Employed Residents Ratio[a]	3.11:1	2.93:1	2.74:1	2.61:1

Source: ABAG, Projections 2005.
Note:
a. Data for the jobs to employed residents were rounded to the nearest hundredth place.

The City's ratio of about three jobs for each employed Palo Alto resident indicates that two thirds of workers in the City's sphere of influence commute from outside the City during each work day. According to ABAG's *A Place to Call Home: Housing in the San Francisco Bay Area*, "Increasingly, there are signs that our current development pattern – auto-dependent [housing] development in the edges of the region far from employment centers – is straining the region's resources… Putting houses closer to jobs and transit also enables workers in the Bay Area to drive fewer miles and, therefore, spend less time behind the wheel. In the Bay Area, nearly 20 percent of workers have a commute time of 45 minutes or more."[20] Because the current development pattern in the region is auto-dependent, it can reasonably be assumed that a majority of those who work in the City but live outside the City travel by car. These vehicle work trips result in vehicle miles traveled, increased traffic congestion within inter-jurisdictional roadways, and vehicular air and noise emissions. It can also reasonably be foreseen that an increase in the current jobs to employed residents ratio correlates to increased vehicle miles traveled, increased traffic congestion within inter-jurisdictional roadways, and increased vehicular air and noise emissions.

[20] ABAG, *A Place to Call Home: Housing in the San Francisco Bay Area*, pp. 2 and 5, June 2007.

Impacts and Mitigation Measures

Standards of Significance

Based on significance thresholds determined by the City of Palo Alto, the SUMC Project would result in a significant population and housing impact if it would:

- 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), that exceeds ABAG projected levels;
- Displace substantial numbers of existing housing units, necessitating the construction of replacement housing elsewhere;
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere; or
- Cumulatively exceed regional or local population projections.

In addition to the foregoing standards of significance, this section also analyzes the SUMC Project's impact on the City's local jobs to employed residents ratio. The SUMC Project would increase the number of jobs created on the SUMC Sites beyond what is contemplated in the City's existing Comprehensive Plan and zoning ordinances, both of which would need to be amended to accommodate the SUMC Project. Therefore, this section analyzes whether such amendments would create a 0.01 or more change in the City's jobs to employed residents ratio. This impact is not, by itself, an environmental impact; however, it is being analyzed because this impact would result in secondary environmental impacts that have been found to be significant and unavoidable in other sections of this Draft EIR, including Sections 3.5 and 3.6 (Air Quality and Climate Change, respectively). Specifically, the SUMC Project's impact on the jobs to employed residents ratio results in increased commute traffic, and that increase in commute traffic is a significant contributor to the SUMC Project's significant and unavoidable impacts on air quality and climate change. As such, the analysis in this section identifies additional mitigation measures relating to the jobs to employed residents ratio, with additional measures the City can consider as a means for further mitigating those significant environmental impacts identified in Sections 3.5 and 3.6.

Environmental Analysis

PH-1. Population Growth. The SUMC Project would increase on-site employment and visitors and thus indirectly induce housing demand and population growth; however, the percentage of regional housing demand resulting from the SUMC Project would be relatively small in comparison with projected housing growth in the region, and would comprise a less-than-significant environmental impact. (LTS)

Direct Housing Demand. The SUMC Project would not include the development of new housing units and would thus not directly increase the residential population within the region. However, the SUMC Project would increase on-site employment by 2,417 persons at 2025 full buildout and occupancy, or 2,242 persons if adjusted for part-time employment (see Table 3.13-6). The increased employment would occur within the City.

Table 3.13-6
Net Increase in SUMC Site Employment

	Existing	Proposed	Change	Part-Time Multiplier[a]	Net change (Adjusted For Part-Time Employment)
SHC	5,240	6,562	1,322	0.94653	1,251
LPCH	1,666	2,655	989	0.90149	891
SoM[b]	2,823	2,823	0	-	0
Non-SUMC Providers	151[c]	257	106	0.94653	100
Total	**9,880**	**12,297**	**2,417**		**2,242**

Source: SUMC and KMA, 2009.

Notes:

a. Employment counts have been adjusted by KMA to count only the portion of housing need for part time employees generated by the SUMC Project. The adjustment is based on the assumption that part-time employees generally have other employment. The adjustment is calculated from SUMC payroll data and weights part-time employees based on percentage of a full-time schedule. Part-time employees working up to 70 percent of full time are adjusted; employees working 70 percent time or more are not assumed to have another part-time job and are therefore not adjusted.

b. For the purposes of the housing analysis, SoM employment is assumed to be unchanged. The SoM predicts that the number of employees located within the City of Palo Alto would decrease by 106 employees as a result of the SUMC Project.

c. Estimated by KMA at 350 square feet per employee.

SUMC facilities currently employ an estimated 9,880 people. The SUMC Project would result in an approximately 23 percent increase in SUMC Site employment.[21] Employment growth at the SUMC Sites of approximately 2,242 employees could represent approximately 17 percent of the 13,210 new jobs forecasted by ABAG within the City's sphere of influence from 2005 to 2025.[22] As discussed under the analysis of jobs to employed residents impact below (PH-3), while some of this increase in jobs was accounted for in ABAG forecasts, most of this growth will require amendments to the City's Comprehensive Plan and zoning and thus such growth is in excess of those forecasts.

In addition to increased employment on site, increased visitorship would occur as a result of adding new hospital beds and increasing medical office/clinic floor area. The SUMC Project would add 248 new inpatient beds within the SHC and LPCH hospitals.[23] As shown in Table 2-8 in the Project Description, the combined total annual inpatient days[24] in both hospitals would increase by 76,701 or 38 percent (from 202,934 in 2006 to 279,635 in 2025). Total

[21] 2,242 new SUMC Site jobs / 9,880 existing SUMC Site jobs = 23 percent of total.

[22] 2,242 new SUMC Site jobs / 13,210 new jobs within the City's sphere of influence = 17 percent of total.

[23] 961 beds proposed (600 at SHC; 361 at LPCH) – 713 beds existing (456 at SHC; 257 at LPCH) = 248 beds net change.

[24] "Inpatient days" refers to the total number of days that beds are filled for the year. One hundred percent occupancy would equal the total number of beds multiplied by 365 days.

outpatient visits would increase by 215,050 or 42 percent (from 511,248 in 2006 to 726,298 in 2025). Visitorship would not directly result in an increase in permanent residents. Therefore, the increase in the visitor population would not result in substantial, unplanned growth.

Additional temporary employee growth on site would occur during the construction period. There could be up to 2,200 construction workers at the SUMC Site during the construction period. The average combined construction employment for the SHC, LPCH, and SoM would average between 300 and 1,615 workers at a given time. Although the population increase associated with construction workers would generate demand for services, the population increase would be temporary in duration. Moreover, construction jobs would primarily be filled by workers currently residing in the Bay Area region; therefore, construction workers as a result of the SUMC Project would not result in substantial, unplanned population growth.

This increase in population growth, by itself, is not an environmental impact per se. To the extent that it would result in secondary environmental impacts (e.g. traffic, noise, air quality, climate change), those impacts are addressed by topic in the various sections of this EIR. The analysis set forth below focuses instead on the impact this population growth would have on housing demand in the region.

Indirect Housing Demand. The increase in employment at the SUMC Site would result in indirect local housing demand, and thus a potential influx of new residents, within Palo Alto and other jurisdictions within the region. The Housing Needs Analysis (Appendix K) converts the number of new employees to the number of employee households that will work within the proposed facilities. This approach recognizes that there is, on average, more than one worker per worker household. The workers per worker household ratio eliminates from the equation all non-working households, such as housing for retired persons, students, and those on public assistance. The Santa Clara County average of 1.72 workers per worker households is used in this analysis because new workers at the SUMC Sites would be more similar to the County as a whole than the smaller City of Palo Alto profile.[25] Given the rate of 1.72 workers per worker household and that the SUMC Project would result in a net increase of 2,242 employees, a demand of about 1,303 housing units to support the households would be induced by the SUMC Project at 2025 full buildout and occupancy (see Table 3.13-7).

Geographic Distribution of Housing Demand Within the Region. The choice of where one lives depends on many factors — affordability, schools, style of housing, types of amenities, location of work of other wage earners in a household, local services, etc. — as well as the commute distance to where one works. It is thus expected that not all new employees at the SUMC Site would live in Palo Alto, although new employees would live in various jurisdictions within a commuting distance to the SUMC Site. The distribution of where new

[25] Keyser Marston Associates, Inc., Final Proposed Stanford University Medical Center Expansion Housing Needs Analysis, prepared for the City of Palo Alto, September 2009.

Table 3.13-7 Indirect Housing Demand Associated with SUMC Project		
	Net Added Employment	**Net Added Employee Households**
SHC	1,251	727
LPCH	891	518
Non-SUMC Providers	100	58
Total	**2,242**[a]	**1,303**[a]

Source: KMA, 2009.

Note:

a. These numbers differ slightly from the report prepared by KMA due to rounding.

SUMC Project employees would live is based on existing SUMC employee zip code data provided by Stanford (see Appendix L).[26]

Table 3.13-8 shows the distribution of SUMC Project housing demand based on the existing SUMC employee commute patterns. These distribution trends can be used to derive how much of the induced housing demand would occur in Palo Alto as well as other jurisdictions in the region. According to the SUMC employee zip code data, approximately 95.2 percent of SUMC employees live within the Bay Area, while about 4.8 percent live outside of the region. Out of the employees that live in the Bay Area region, approximately 45.9 percent live in Santa Clara County, 24.2 percent live in San Mateo County, 8 percent of SUMC workers live within the City of Palo Alto, 4.1 percent live in Menlo Park, and approximately 1.1 percent live at the Stanford University campus. This analysis assumes that the distribution of housing demand from the new employees would follow the existing distribution pattern. Based on this distribution, in total, the SUMC Project would generate demand for approximately 1,241 housing units throughout the Bay Area region and approximately 62 housing units outside of the Bay Area region. Within the Bay Area, the SUMC Project in 2025 would generate demand for approximately 626 units within all of Santa Clara County, 316 units in all of San Mateo County, 104 housing units within the City of Palo Alto, and 53 units in Menlo Park.[27]

Project-induced housing demand in Table 3.13-8 is compared against ABAG Projections 2005, which forecasts the housing that would be built within each community up to 2025. The forecasts consider foreseen policies and funding, as well as land availability, that would allow the housing growth in various areas.[28] Therefore, the Projections can be treated as the foreseeable housing growth (built housing) that could accommodate housing demand from the SUMC Project.

26 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5, Figure 5-5.

27 1,303 SUMC Project housing units (full buildout) x 8 percent = 104 local SUMC Project housing units.

28 ABAG Projections 2005, 2004.

Table 3.13-8
SUMC Project 2025 Indirect Housing Demand by County/ City Based on Existing SUMC Employee Zip Code Distribution

	Residential Location of Palo Alto Employees[a]	ABAG Projected Household Growth 2005-2025[b]	SUMC Project Housing Demand in 2025	SUMC Project Housing Demand as Percent of Household Growth 2005-2025
Santa Clara County				
Palo Alto	8.0%	6,030	104	1.7%
Stanford University Campus	1.1%	3,022[c]	14	0.5%
Mountain View	5.9%	6,220	77	1.2%
Los Altos and Los Altos Hills	1.5%	590	20	3.4%
Sunnyvale, Santa Clara, Cupertino	11.0%	17,780	143	0.8%
San Jose	15.5%	83,780	202	0.2%
Milpitas	2.1%	5,950	27	0.5%
Campbell, Los Gatos, Saratoga, (+Monte Sereno, Alum Rock)	2.3%	~2,920	30	1.0%
Gilroy, San Martin, Morgan Hill	0.7%	~6,104	9	0.2%
Subtotal	*45.9%*	*132,396*	*626*	*0.5%*
San Mateo County				
Menlo Park (+W. Menlo Park)	4.1%	1,910	53	2.8%
East Palo Alto	1.8%	2,710	24	0.9%
Atherton, Woodside, Portola Valley, Emerald Hills	0.9%	~850	12	1.4%
Redwood City	5.5%	~5,140	72	1.4%
Belmont, San Mateo, San Carlos, and Foster City	6.2%	~9,060	81	0.9%
Hillsborough, Burlingame, Millbrae	1.1%	2,200	14	0.6%
South San Francisco, Brisbane, Daly City, Colma, San Bruno	2.9%	10,070	38	0.4%
Half Moon Bay and Coastal (Pacifica, Montara, El Granada, La Honda, Pescadero, Loma Mar, Moss Beach)	1.7%	~3,930	22	0.6%
Subtotal	*24.2%*	*35,870*	*316*	*0.9%*
Alameda County				
Fremont and Hayward	8.9%	18,100	116	0.6%
Newark, Union City, San Leandro, Castro Valley, San Lorenzo	6.1%	~14,410	79	0.6%

Table 3.13-8 SUMC Project 2025 Indirect Housing Demand by County/ City Based on Existing SUMC Employee Zip Code Distribution				
	Residential Location of Palo Alto Employees[a]	**ABAG Projected Household Growth 2005-2025**[b]	**SUMC Project Housing Demand in 2025**	**SUMC Project Housing Demand as Percent of Household Growth 2005-2025**
Oakland, Berkeley, Alameda, Emeryville, Albany, Piedmont	1.0%	46,640	13	0.02%
Dublin, Pleasanton, Livermore, Sunol, and Mountain House	1.3%	~26,757	17	0.06%
Subtotal	*19.3%*	*105,907*	*225*	*0.2%*
San Francisco County	4.0%	44,950	52	0.1%
Contra Costa County	1.3%	71,450	17	0.02%
Marin, Napa, and Sonoma Counties	0.6%	45,300	8	0.02%
TOTAL IN BAY AREA REGION	**95.2%**[d]	**435,873**	**1,241**[d]	**0.28%**
Outside the Bay Area Region	4.8%	-	62	-
TOTAL	**100%**[d]		**1,303**[d]	

Sources:

a. Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 5, Table 5-5. See Appendix L.

b. ABAG, *Projections 2005*, December 2004.

c. Stanford University Community Plan/General Use Permit Draft Environmental Impact Report, Table 2-1, June 2000.

Note:

d. Individual percentages and numbers of units may not sum to the totals due to rounding.

As demonstrated in Table 3.13-8 the indirect housing demand from the SUMC Project would represent a small percentage of the ABAG projected housing growth for all jurisdictions in the Bay Area region. As shown in Table 3.13-2, above, ABAG projects that the number of households would grow from 2005 to 2025 by 18.5 percent in the Bay Area region, 21.8 percent in Santa Clara County, and 20.4 percent in Palo Alto. The indirect housing demand generated by the SUMC Project would be 0.28 percent of the projected household growth in the Bay Area region, 0.5 percent of household growth in Santa Clara County, 0.9 percent of household growth in San Mateo County, 1.7 percent of the projected household growth within the City of Palo Alto, and 2.8 percent of housing growth in Menlo Park, from 2005 to 2025. At most, the indirect housing demand from the SUMC Project would comprise 3.4 percent of projected growth (within Los Altos and Los Altos Hills). Therefore, the SUMC Project would not significantly impact the 2025 forecasted household growth within the City and other jurisdictions within the region, and the demand for housing as a result of the SUMC Project would be less than significant.

In addition, because the ABAG Projections forecast the housing that would be built within each community up to 2025, the Projections can be treated as cumulative housing development. Table 3.13-8 demonstrates that the indirect housing demand from the SUMC Project would represent a small percentage of the cumulative housing development for all jurisdictions in the region.

Income Distribution of Housing Demand. Housing affordability is an important consideration for the City's planning purposes, but it is considered to be a socioeconomic issue that need not be evaluated under CEQA. A shortfall of affordable units within the City of Palo Alto is not considered a physical environmental impact. However, for informational purposes only, this subsection provides the distribution of the indirect housing demand according to affordability levels. This discussion is extracted from the Housing Needs Analysis, provided as Appendix K.

Housing affordability is determined relative to the area median income (AMI) for a locality, which is defined by the U.S. Department of Housing and Urban Development. Very low income housing must be affordable to households with incomes under 50 percent of the AMI; low-income housing is affordable to households with incomes between 51 and 80 percent of the AMI; moderate-income housing is affordable to households with incomes between 81 and 120 percent of the AMI; and above moderate-income housing is affordable to households with incomes over 120 percent of the AMI.

Table 3.13-9 shows a breakdown of the SUMC Project's indirect housing demand according to projected household incomes. As shown in the table, the SUMC Project would indirectly result in demand for 91 units with incomes under 50 percent of the AMI (very low income), 228 units with incomes between 51 and 80 percent of the AMI (low income), 298 units with incomes between 81 and 120 percent of the AMI (moderate income), and 684 units with incomes above 120 percent of the AMI (above moderate income). As indicated previously under Existing Conditions, the City has had difficulty meeting its housing needs allocations, particularly for housing in lower income brackets.

Table 3.13-9
Regional SUMC Project Housing Demand by Affordability, 2025

	SHC	**LPCH**	**Non-SUMC**	**Total**
Number of New Households:				
Under 50% AMI	48	31	12	91
50% to 80% AMI	141	73	13	228
80% to 100% AMI	87	55	7	149
100% to 120% AMI	85	58	6	149
Subtotal through 120% AMI	*361*	*217*	*38*	*617*
120% AMI and Above	364	299	20	684
Total Employee Households[a]	**726**	**517**	**58**	**1,303**

Source: KMA, 2009.
Note:
a. Individual numbers of units may not sum to the totals due to rounding.

PH-2. Displacement of Existing Housing or Residents. The SUMC Project would not displace existing housing or residents because the SUMC Project would involve infill of currently developed sites that do not contain housing. Thus, the SUMC Project would result in no impact with respect to displacement of housing or residents. (NI)

No housing units would be demolished to allow for the construction of the SUMC Project and therefore no replacement housing would be required. Correspondingly, no segment of the population would be displaced, such that the construction of replacement housing units elsewhere would be required. Therefore, the SUMC Project would have no impact on displacement of people or housing.

PH-3. Impacts on Jobs to Employed Residents Ratio. The SUMC Project would have an adverse impact on the City's jobs to employed residents ratio because it would exceed the existing Comprehensive Plan and zoning allowances for the SUMC Sites and thus require amendment to the Comprehensive Plan and rezoning, and it would increase the City's jobs to employed residents ratio by more than 0.01. However, this impact is not, itself, an environmental impact. This impact would result in secondary environmental impacts relating to additional commute traffic, including the significant and unavoidable impacts on air quality and climate change, as identified in Sections 3.5 and 3.6. The present analysis of impacts to the "jobs to employed residents" ratio is presented for informational purposes, and for the purpose of identifying additional mitigation measures for those identified impacts

The SUMC Project would exceed the development allowances under the current Comprehensive Plan and zoning designations of the SUMC Sites. As such, the SUMC Project would generate employment in excess of what is currently contemplated by the City. This issue fits within the City's planning goals regarding provision of adequate housing to support its employment levels. If these planning goals are not obtained, environmental impacts would result such as increased vehicle miles traveled, increased traffic congestion within inter-jurisdictional roadways, and increased vehicular air and noise emissions.

As discussed above, although the SUMC Project would not have a significant impact on housing growth in the region, the jobs to housing balance focuses instead on the significant increase in job generation concentrated on the SUMC Sites, as compared to the lack of housing within the City to accommodate that job growth. This imbalance between jobs and employed residents would result in secondary traffic, air quality, climate change, and other impacts resulting from employees commuting to the job site. While such impacts are directly addressed in other sections of this document (particularly Section 3.4, Transportation, Section 3.5, Air Quality, and Section 3.6, Climate Change), it is also useful to directly analyze the manner in which the effect of the SUMC Project on the jobs to employed residents ratio relates to those other impacts.

Sections 3.5 and 3.6 identify significant and unavoidable impacts relating to air quality and climate change, and the additional commute-related traffic resulting from the imbalance between jobs and employed residents is a significant contributor to those impacts. For example, Tables 3.5-6 and 3.5-7, in Section 3.5, Air Quality, demonstrate that a majority of the SUMC Project's emissions are from mobile sources, and the section further explains that 40 percent of these mobile emissions are from employee trips. These emissions result in a significant and unavoidable impact on air quality (see Impacts AQ-2 and AQ-7). Likewise, Tables 3.6-4 and 3.6-6, in Section 3.6, Climate Change, demonstrate that the majority of the SUMC Project's greenhouse gas emissions result from these same mobile sources (listed in the tables under the category of "Non-fleet Vehicular Emissions (VMT)"), which result in an identified significant and unavoidable impact on climate change (see Impacts CC-1 and CC-2). Finally, the SUMC Project's impact on the jobs to employed residents ratio may also play a contributing role to the SUMC Project's significant and unavoidable impacts on traffic circulation (see Impacts TR-2 and TR-3 in Section 3.4, Transportation).

Currently Projected Jobs to Employed Residents Ratio. The jobs to employed residents ratio is a metric used to assess the effectiveness of smart growth principles with an optimal ratio being 1:1 (one job per one employed resident). An increase in the jobs to employed residents ratio correlates to increased vehicle miles traveled, increased traffic congestion within inter-jurisdictional roadways, and increased vehicular air and noise emissions. As shown in Table 3.13-5, the City's current jobs to employed residents ratio is expected to generally improve over time as the number of employed Palo Alto residents grows (that is, employed residents would grow at a higher rate than jobs, although the total number of jobs would still be higher than the total number of employed residents). In 2005, the City had 3.11 jobs for every employed resident within its sphere of influence. In 2010, ABAG estimates that the City would have 2.93 jobs for every employed resident within its sphere of influence. In 2025, ABAG estimates that the City would have 2.61 jobs for every employed resident within its sphere of influence.

ABAG projects an increase in the number of employed residents for Palo Alto, assuming that, over time, (1) currently unemployed Palo Alto residents would seek work; and/or (2) a larger portion of the new residents associated with future Palo Alto housing developments would be employed.[29] While the SUMC Project does not include housing units, it could provide employment opportunities for existing Palo Alto residents. However, this analysis conservatively assumes that none of the new employees would consist of people already living in Palo Alto.

Impact of SUMC Project on Jobs to Employed Residents Ratio. The SUMC Project would be constructed and operational by 2025. The currently projected jobs to employed residents ratio in 2025 is approximately 2.61 (without the SUMC Project). Adding the 2,242 new employees to the ratio of 2.61 jobs to employed residents within the City,[30] the SUMC Project

29 ABAG Projections 2005, 2004.
30 112,560 jobs to 43,160 employed residents within the City = 2.61

would increase the 2025 ratio by approximately 0.05, resulting in a 2025 ratio of about 2.66 jobs per employed resident.[31] This calculation is shown in Table 3.13-10.

Housing Demand Associated with the Additional Jobs Beyond the 432-Job Threshold. Recognizing that not all household members are employed, Palo Alto's threshold uses a jobs to employed residents threshold rather than the more generic jobs to housing metric. Table 3.13-11 converts the jobs to housing ratio to a jobs to employed residents per household ratio and shows that the SUMC Project would result in a total demand of approximately 1,303 new households in the region and 1.052 households above the 0.01 threshold.[32] The projected new households in the region are expected to be distributed in a manner consistent with the distribution data on Table 3.13-8. By applying the existing SUMC employee commute patterns, it is expected that only 8 percent of the new employees under the SUMC Project would live in Palo Alto. Thus, the remaining 92 percent of the employees would be expected to live outside the City.

In-Lieu Housing Fee. Section 16.47 of the Palo Alto Municipal Code requires developers of large projects, as a condition of using land for the privilege of development, to contribute to programs that increase the City's low-income and moderate-income housing stock. Hospitals and universities, among other uses, however, are exempt from Section 16.47.[33] As such, the SHC and LPCH hospital components, and the Stanford University SoM research/laboratory component of the SUMC Project are not subject to this requirement.

The non-exempt (clinic/medical office) portion of the SUMC Project would be subject to an in-lieu fee of approximately $2.16 million.[34] This in lieu fee rate only represents approximately 26 percent of the cost of the housing demand generated by the non-exempt portion. In addition, the bulk of the SUMC Project is currently exempt from the fee altogether. Accordingly, the City has determined that payment of the in-lieu fee as set forth in the Municipal Code would not be sufficient to offset the cost of constructing the housing demand from SUMC Project. Fees offset some housing demand for affordable units but would not reduce the impact to a less-than-significant level.

31 112,560 jobs in 2025 + 2,242 jobs under the SUMC Project = 114,802 jobs/43,160 employed residents within the City = 2.66

32 2,242 new SUMC jobs/1.72 jobs to housing ratio within the County in 2000= 1,303 new households.

33 The following uses are exempt from the housing fee: residential uses; churches; colleges and universities; commercial recreation; hospitals and convalescent facilities; private clubs, lodges, and fraternal organizations; private education facilities; public facilities; and retail service, eating and drinking service, personal service, or automotive service when the total additional square footage is 1,500 square feet or less.

34 CBRE, Stanford University Medical Center Facilities and Replacement Project, Fiscal Impact Analysis, February 2009, Exhibit 58.

Table 3.13-10
Impact on City of Palo Alto Jobs to Employed Residents Ratio, 2025

Number of Projected Jobs in the City of Palo Alto	112,560
Number of Projected Employed Residents	43,160
Projected Jobs to Employed Residents Ratio Without Project	2.6079703
SUMC Project Total Net Employment[a]	2,242
Number of Jobs to Increase the Jobs/Employed Residents Ratio More than 0.01[b]	432
Number of Jobs Generated by the SUMC Project Above and Over the 0.01 Ratio[c]	1,810
Resulting Jobs to Employed Residents Ratio with the SUMC Project[d]	2.6599166
Difference Between Ratio without the SUMC Project and with the SUMC Project	+0.0519463

Sources: ABAG 2005, City of Palo Alto, 2010.
Notes:
a. Adjusted for part-time.
b. 2.6079703 (existing 2025 jobs/housing ratio) + 0.01 x 43,160 (2025 employed residents) = 112,991.59 jobs. 112,991.59 jobs – 112,560 jobs (projected 2025 jobs within the City) = 431.6 = ~432 jobs
c. 2,242 (new SUMC Project employees) – 432 (City thresholds) = 1,810 jobs
d. 112,560 (2025 jobs) + 2,242 (SUMC new employees) / 43,160 (employed residents) = 2.6599166 = ~2.66

Table 3.13-11
Jobs to Employed Residents Residents/Housing, 2025

SUMC Project Total Net Employment[a]	2,242
Workers/Worker Household[b]	1.72
Demand for Worker Households from SUMC Project[c]	1,303.49
Number of Jobs Generated by the SUMC Project Above and Over the 0.01 Threshold[d]	1,810
Demand for Worker Households from SUMC Project Jobs Above and Over the 0.01 Threshold[e]	1,052.32

Sources: ABAG Projections 2005; City of Palo Alto, 2010.
Notes:
a. Adjusted for part-time.
b. Data from U.S. Census 2000 for Santa Clara County.
c. 2,242 (new SUMC Project employees) / 1.72 (worker/worker household ratio) = 1,303.49 = ~1,303
d. 2,242 (new SUMC Project employees) – 432 (City threshold) = 1,810 jobs
e. Number of new jobs above the 0.01 ratio/the existing workers per household ratio = 1,810/1.72 = 1,052.32 = ~1,052

MITIGATION MEASURE. Mitigation Measure PH-3.1 below suggests several measures that could be implemented by both the City and the SUMC Project sponsors. The measures include opportunities to support or develop housing units, including affordable housing units, within the City. Table 3.13-12 shows a breakdown of the SUMC Project's housing demand based on projected household incomes. As shown in the table, the SUMC Project would indirectly result in demand for 74 households with incomes under 50 percent of the AMI (very low income); 190 units with incomes between 51 and 80 percent of the AMI (low income); 232 units with incomes between 81 and 120 percent of the AMI (moderate income); and 558 units with incomes above 120 percent of the AMI (above moderate income).

Table 3.13-12
Affordability Distribution of SUMC Project Household Demand Over the Jobs Threshold (432 new jobs)

	Number of New Households
Very Low Income – Under 50% AMI	74
Low Income – 50% to 80% AMI	190
Moderate Income – 80% to 120% AMI	232
Subtotal through 120% AMI	*496*
Above Moderate Income – 120% and above AMI	558
Total Employee Households	**1,054**[a]

Source: City of Palo Alto, 2010.
Note:
a. Differs slightly from 1,052 in Table 3.13-11 due to rounding.

Implementation of Mitigation Measure PH-3.1 would reduce the impact on the City's jobs to employed residents ratio; however, such implementation would not fully avoid the SUMC Project's impact on the jobs to employed residents ratio because (1) the measures would not guarantee provision of housing units to cover the demand from the 1,052 households (or 8 percent thereof), and (2) due to the various factors that people consider in choosing where to live, it cannot be ascertained that the 1,810 workers would choose to live in Palo Alto. Due to the high concentration of jobs in Palo Alto, it is possible that a strong affordable housing program would result in reduced traffic congestion, vehicle miles traveled, and greenhouse gas emissions.

Implementation of Mitigation Measure PH-3.1 is not directly required in order to mitigate a significant environmental impact, but rather should be considered as possible additional mitigation for Impacts AQ-2, AQ-7, CC-1, and CC-2, as discussed in Section 3.5, Air Quality, and Section 3.6, Climate Change, of this EIR. However, it should be stressed that these measures are presented here only in conceptual terms, and the City may find that some or all of them are not feasible for various legal, practical, or other reasons. As such, Mitigation Measure PH-3.1 is presented for informational purposes, and to ensure that all possible options for mitigation of these impacts are adequately considered.

PH-3.1 *Reduce the Impacts on the Jobs to Employed Residents Ratio.* In order to reduce the SUMC Project's impacts on the City's jobs to employed residents ratio, one or more of the following measures shall be implemented by both the City and the SUMC Project sponsors:

- The City shall explore amending the Zoning Code to permit more residential uses, particularly multifamily residential use;
- The SUMC Project sponsors shall ensure that a specified number of housing units in the County shall be dedicated to SUMC employees;

- The City shall amend the Zoning Code to remove the hospital exemption from payment of the affordable housing fee;
- The City shall impose an additional ad hoc housing fee on development to ensure development of required affordable housing. The amount of the fee shall be based on the cost of the additional affordable housing units induced by the SUMC Project as well as the cost of the General Fund subsidy contribution to the existing housing impact fee; and/or
- The City shall provide an inclusionary housing requirement in the newly created Hospital District. The requirement shall provide a number of options for development of additional housing with an emphasis on affordable housing.

Cumulative Analysis

Direct and Indirect Regional Population Growth. The geographic context for cumulative population inducement, including cumulative housing demand, includes the various communities wherein new employees from the SUMC Project would be expected to live. These communities include those listed in Table 3.13-8. As discussed under Impact PH-1, individuals who comprise daytime population within a site, mostly employees and visitors, typically originate from the local region (the San Francisco Bay Area) and do not in and of themselves comprise new permanent residents. Employees and visitors are transient occupants of a locality and are not a permanent population increase. An increase in daytime population thus does not comprise a significant population impact. (However, the associated environmental impacts of increased daytime population from employment and visitorship, such as traffic generation, air and noise emissions, utilities, and public service demand, are addressed as separate topics in various sections of this EIR.) Therefore, the SUMC Project, in combination with other foreseeable development, would have a less than cumulatively considerable impact on direct and indirect population growth.

As explained under Impact PH-1, because the ABAG Projections forecast the housing that would be built within each community up to 2025, the projections can be treated as cumulative housing development. As such, the cumulative analysis pertaining to indirect housing demand or increases in permanent (residential) population is already provided under Impact PH-1, under Indirect Housing Demand and Geographic Distribution of Housing Demand. Table 3.13-8 demonstrate that the indirect housing demand from the SUMC Projects would represent a small percentage of the cumulative housing development at 2025 for all jurisdictions.

Displacement. As discussed under Impact PH-2, the SUMC Project would not displace people or housing and would therefore have no contribution to a cumulative impact.

Jobs to Employed Residents Ratio. The cumulative analysis regarding the jobs to employed residents ratio would only include those projects that would require a Comprehensive Plan amendment and rezoning; however, no other foreseeable projects would require a Comprehensive Plan amendment and/or rezoning. As such, no other foreseeable projects would cumulatively affect the City's jobs to employed residents ratio.

3.14 PUBLIC SERVICES

Introduction

This section addresses the potential environmental effects of the SUMC Project on public services, including police and fire protection, schools, and parks and recreational services. Public service impacts are assessed in the context of the 1995 appellate court decision *Goleta Union School District v. The Regents of the University of California*. This decision holds that an increase in demand for public services, such as additional staff or lengthier response times, could lead to potentially significant environmental impacts only if constructing or expanding a new facility was required and the construction or operation of the facility might adversely affect the air, water, noise, or other aspects of the physical environment. As a result, increases in public service demand alone do not constitute a significant environmental effect; and if significant effects are identified, the City must identify appropriate mitigation measures.

The City is the service provider for fire protection, police protection, and public parks and recreational facilities. The Palo Alto Unified School District (PAUSD) provides school services within the City. As such, the analysis in this section is based on development information from the SUMC Project application and on input from the various City departments and the PAUSD.

Public service issues and comments identified in response letters to the NOP, and during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project, were considered in preparing this analysis. The Committee for Green Foothills requested an analysis of the direct, indirect, and cumulative impacts on recreational resources that could result from the SUMC Project. Additional comments requested a discussion of the recreational amenities that the SUMC Project would provide and how the SUMC Project would increase demand for recreational facilities. Several parties provided comments concerning the impacts on schools, which include a request for analysis of the indirect impacts on schools of the SUMC Project caused by the induced housing demand. This analysis addresses impacts related to recreational facilities and schools, as well as impacts related to fire and police protection.

Existing Conditions

Fire Protection and Emergency Services

The Palo Alto Fire Department (PAFD) provides year-round fire and emergency services to the City and Stanford University, and serves the Town of Los Altos Hills during summer months, when the risk of wild fires is greater. Between 2006 and 2007, eight PAFD stations served a total of approximately 75,000 residents (in the City and Stanford University) in a service area of approximately 50 square miles.[1] The PAFD serves a daytime population of over 125,000 people, which includes a large number

[1] Palo Alto Fire Department, http://www.pafd.org/profile/index.html, accessed October 4, 2007.

of employees from high-technology businesses and Stanford University.[2] Between 2006 and 2007, the PAFD had a total of 103 full-time firefighters, which resulted in a staffing ratio of 1.37 firefighters per 1,000 residents served.[3] The PAFD's ratio of daytime population to firefighters is approximately 0.82 firefighters per 1,000 people. Each fire station provides services to approximately 12,500 City residents.[4, 5] According to the PAFD, "the number of residents served per fire station has increased by two percent over five years, but is still substantially below the number served per fire station in some other local jurisdictions."[6] PAFD personnel are organized into the following four functional areas: (1) Emergency Response; (2) Environmental and Safety Management; (3) Training and Personnel Management; and (4) Records and Information Management.[7]

From 2006 to 2007, the PAFD responded to 7,236 calls for service, of which 55 percent were medical related; 18 percent were false alarms; five percent were service calls, such as fire alarm system malfunctions, invalid assists, welfare checks, etc., of which three percent were fire related; three percent were hazardous conditions related; and 17 percent were other types of emergencies.[8] The average response time of the PAFD was five minutes and 48 seconds for fire calls and five minutes and 17 seconds for emergency medical calls.[9]

The PAFD does not evaluate its level of service by staffing ratio goals; instead, service goals are set by the percent of calls that are responded to under a specified response time goal.[10] The PAFD's average response time goal is to respond to 90 percent of fire emergencies and emergency medical requests for service within eight minutes, and to respond to 90 percent of paramedic calls for service within 12 minutes (Emergency medical request are more life threatening calls that require ambulance life support [ALS] transportation, and paramedic calls are calls that are less serious and require basic life support [BLS] transportation). During the 2006-2007 fiscal year, the PAFD responded to 87 percent of fire emergency calls within its response time goal, 92 percent of emergency medical calls within its response time goal, and 97 percent of paramedic calls within the response time goal.[11] Therefore, the

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2 City of Palo Alto, Fire Department. Available at: http://www.pafd.org/profile/index.html, accessed October 4, 2007.

3 City of Palo Alto. 2008. *Service Efforts and Accomplishments Report 2006-2007*, Annual Report on City Government Performance, Chapter 3 – Fire, January.

4 City of Palo Alto. 2008. *Service Efforts and Accomplishments Report 2006-2007*, Annual Report on City Government Performance, Chapter 3 – Fire, January.

5 Station #8 is a seasonal (summer) station, and was not included. In addition, Station #7 is on the Stanford Linear Accelerator (SLAC) site, which has no residents, and was also not included.

6 City of Palo Alto. 2008. *Service Efforts and Accomplishments Report 2006-2007*, Annual Report on City Government Performance, Chapter 3 – Fire, January.

7 City of Palo Alto, Fire Department. Available at: http://www.pafd.org/profile/index.html, accessed December 5, 2003.

8 City of Palo Alto. 2008. *Service Efforts and Accomplishments Report 2006-2007*, Annual Report on City Government Performance, Chapter 3 – Fire, January.

9 City of Palo Alto. 2008. *Service Efforts and Accomplishments Report 2006-2007*, Annual Report on City Government Performance, Chapter 3 – Fire, January.

10 City of Palo Alto. 2008. *Service Efforts and Accomplishments Report 2006-2007*, Annual Report on City Government Performance, Chapter 3 – Fire, January.

11 City of Palo Alto. 2008. *Service Efforts and Accomplishments Report 2006-2007*, Annual Report on City Government Performance, Chapter 3 – Fire, January.

PAFD met its percentage goal for responding to calls under its response time goal for emergency medical and paramedic calls, but did not meet its goal for fire emergency calls.

An inventory of PAFD's vehicles is as follows: the front line equipment consists of seven engines, one truck company, one heavy rescue/hazardous materials vehicle, one paramedic ambulance, and one Suburban command vehicle; the PAFD reserve units consist of two engines, two wildland engines, three patrol units, three reserve ambulances (one used as the 12-hour paramedic unit and one used as our Basic Life Support inter-facility unit), one utility vehicle, one mutual aid breathing support unit, one Suburban for the training captain, and one jointly-owned 75-foot ladder truck with the City of Mountain View that is kept at a Mountain View fire station.

The SUMC Sites are primarily served by PAFD Station 1, at Alma Street and Everett Avenue. PAFD Station 6, on the Stanford University campus, and PAFD Station 2, at Hanover Street and Page Mill Road, respond routinely when Station 1 is unavailable. On some occasions, as part of the Automatic Aid Agreement between the two agencies, the Menlo Park Fire District (MPFD) responds to the downtown area of the City when PAFD Station 1 is not available. PAFD Station 1 currently responds to one third of the PAFD's total calls and receives 2.5 times the average number of calls received per station. Station 1 covers a service area of approximately 1.5 square miles and currently meets average response time goals.[12, 13] PAFD Station 1 currently has facility space (capacity) for the firefighters and vehicles stationed there; however, no capacity is available for additional staff or vehicles.[14]

In October 1, 1976, the City and Stanford University entered into an agreement (Palo Alto-Stanford Fire Protection Agreement) that requires the City to provide fire protection to the Stanford University campus. This agreement is scheduled to terminate in 2026, at which point Stanford University and the City will choose to renew, modify, or terminate the agreement.[15] The agreement states that the City shall provide fire protection services to the Stanford University campus and, in return, Stanford University shall pay its share of expenditures. This share of expenditures has been determined to be 30.3 percent of the PAFD's total annual expenditures. This 30.3 percent is subject to adjustment in the event that the PAFD provides substantially more, or substantially less, fire protection services to the Stanford University campus.

Under the Palo Alto-Stanford Fire Protection Agreement, PAFD occupies and operates portions of the Stanford Fire Station (Station 6) as an independent contractor. Under this agreement, the City of Palo Alto shall neither abandon nor vacate Station 6 without Stanford's prior written approval. In addition, Palo Alto does not have any authority in determining a new location for Station 6, in the event that the City would intend to relocate this station.[16]

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12 Dan Firth, Fire Marshal, Palo Alto Fire Department. Electronic communication with PBS&J, January 17, 2008.

13 Dan Firth, Fire Marshal, Palo Alto Fire Department. Electronic communication with PBS&J, March 4, 2008.

14 Dan Firth, Fire Marshal, Palo Alto Fire Department. Meeting with City staff, PBS&J, and CBRE Consultants, May 5, 2008.

15 Palo Alto-Stanford Fire Protection Agreement. 1976.

16 Palo Alto-Stanford Fire Protection Agreement. 1976.

As mentioned above, the MPFD routinely responds to calls in the City as part of an Automatic Aid Agreement between the two agencies; the MPFD responds to the downtown area of the City when PAFD Station 1 is not available. This provides the most efficient use of available fire suppression resources, the two fire departments would have an assured mutual response into a fire threat zone overlapping the City of Palo Alto and the City of Menlo Park. Under this agreement, the closest emergency response apparatus for fire suppression and first responder for medical emergencies would provide automatic response within an overlapping territory of the two municipalities.[17]

American Medical Response (AMR) is the 911 ambulance system provider in the County of Santa Clara (County). An agreement is in place between the PAFD and AMR for AMR to provide back up ambulance service when all of the PAFD's ambulance resources are committed to other emergency calls. Although the PAFD met their percentage goals for responding to medical emergency and paramedic calls within their specified response time, AMR reported that they receive approximately 60 medical response calls per month from the City, 20 of which were canceled before prior to arrival.[18] The contract between AMR and the County does not legally require AMR to respond to ambulance calls within the City.[19] The average response time for AMR's responses in the City is approximately 12 minutes, which is longer than the PAFD average response time of five minutes and 17 seconds.[20] AMR's response to calls in the City is not included in the data the PAFD uses to assess whether or not they met their response time goals.

In addition, the Stanford Hospital's Emergency Department (ED) serves the City. The 11,700-square-foot ED has 38 treatment spaces and receives 42,522 annual visits (an average of 117 visits daily). As discussed in Section 2, Project Description, the existing ED does not provide adequate space for patient waiting areas, triage space, and trauma rooms based on contemporary industry standards.

The SHC and LPCH do not operate an ambulance system. The PAFD is the primary 911 ambulance service provider to the City, Stanford Campus, and the Stanford Linear Accelerator (SLAC) National Accelerator Laboratory. Patients are generally transported to the hospital of their choice unless they are afflicted by a major trauma, medically unstable, or fall into predestinated categories as identified by County Emergency Medical Services Policy. Most patients in the City choose the SHC as a primary hospital, with other patients typically choosing to go to Kaiser Permanente. In addition, many veterans choose to go to Palo Alto Veterans Administration (VA) Hospital.[21]

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17 *Agreement Between the City of Palo Alto and the Menlo Park Fire Protection District for Automatic Aid into Interjurisdictional Fire Protection Service Zone*. 1999.

18 Jeff Dane, Operations Manager Santa Clara County, American Medical Response. Electronic communication, December 12, 2008.

19 *Agreement between the County of Santa Clara and American Medical Response –West for Pre-hospital Emergency Medical Care and Transport Services*. Available at: http://www.sccemsagency.org/SCC/docs/Emergency%20Medical%20Services%20(DEP)/attachments/5.11%20AMR%20Agreement%20-%20Complete.pdf, page 10, accessed May 8, 2008.

20 Dan Firth, Fire Marshal, Palo Alto Fire Department. Electronic communication, April 13, 2008.

21 Dan Firth, Fire Marshal, Palo Alto Fire Department. Electronic communication, March 11, 2008.

In the event of a large, single-site emergency with multiple patients, the County has policies that the first responders and emergency rooms are required to follow. That is, in the event of a single-site, multiple-patient event, all first responders would follow the County Multi Patient Management Plan (MPMP). The MPMP coordinates patient destinations based on proximity of a hospital and its capacities at the time of the event as communicated through County Emergency Medical Services software available to all emergency communications centers.[22] Therefore, during a multiple patient event, patients would be transported to the nearest hospital until it reached capacity and additional patients would then be transported to the next closest hospital.

Police Protection Services

The Palo Alto Police Department (PAPD) provides law enforcement services to the City, including the SUMC Sites. Stanford University provides its own security services within its campus area outside the City, through the Stanford Public Safety Department.[23] As of the 2006-2007 fiscal year, PAPD staff included a total of 164 full-time employees, with 93 sworn officers, including one chief, two captains, six lieutenants, 14 sergeants, 19 agents, and 51 officers.[24] The PAPD has 30 marked vehicles and nine motorcycles.[25] The PAPD has one central station located at 275 Forest Avenue, which serves the entire City.

The City is divided into four areas, commonly referred to as beats. The SUMC Sites lie in PAPD Beat One, which covers an area of approximately 4 square miles, and is routinely patrolled by one officer and one patrol vehicle. The PAPD calculates and reports service statistics, such as the volume of calls received, according to geographic areas known as reporting districts. The Hoover Pavilion Site is located in District 112, and the Main SUMC Site is located in District 113. In 2007, the PAPD received 1,692 calls from District 112 and 1,229 calls from District 113.[26] In 2007, approximately 605 calls were received from the SUMC Sites.[27] The SUMC Sites therefore generated approximately 1.0 percent of 60,079 calls received by the PAPD in 2006-2007 fiscal year.

Because the daytime population in the City increases from approximately 61,200 to 125,000, the current staffing ratio of police officers per 1,000 people fluctuates between 0.74 during day time hours,

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22 Dan Firth, Fire Marshal, Palo Alto Fire Department. Electronic communication, March 11, 2008.

23 The rest of Stanford University outside City limits is served by the Stanford University Public Safety Department, which is a member of the Santa Clara County Sheriff's Department. The Stanford University Public Safety Department is a multiple-service agency that provides law enforcement, security, safety, crime prevention and emergency services on the Stanford University campus. However, the Stanford University Public Safety Department does not serve the SUMC Sites. (Stanford University Public Safety Department, Available at: http://www.stanford.edu/group/SUDPS/contact.shtml, accessed May 15, 2008.)

24 City of Palo Alto. *2006-07 Adopted Budget*.

25 City of Palo Alto. 2008. *Service Efforts and Accomplishments Report 2006-2007*, Chapter 6 – Police, January.

26 Ron Watson, Lieutenant, Palo Alto Police Department. Follow-up Information Regarding Medical Center and Shopping Center Expansions, May 5, 2008.

27 Ron Watson, Lieutenant, Palo Alto Police Department. Follow-up Information Regarding Medical Center and Shopping Center Expansions, May 5, 2008.

and 1.49 during nighttime hours.[28, 29, 30] However, the PAPD does not measure its service goals with staffing ratios; instead, service goals are determined through the percentage of emergency calls that are responded to within a target time and the average response time for urgent calls. The PAPD categorizes calls requiring police response as "emergency", "urgent", and "non-emergency."[31]

- *Emergency Calls*. Emergency calls include crimes in progress that are life-threatening or involve potentially significant loss of property. These calls include major injury accident calls and medical calls, such as for heart attacks. The PAPD goal for response to an emergency call is to respond to 90 percent of emergency calls within six minutes. In the 2006-2007 fiscal year, the PAPD responded to 73 percent of emergency calls within six minutes and thus did not meet their goal. (The average response time for emergency calls was five minutes and eight seconds.)[32]

- *Urgent Calls*. Urgent calls include suspicious activity in progress or requests to respond to emergencies that occurred within the last hour but that are not currently in progress. The PAPD measures their goals for responding to urgent calls by average response times and not percentage of calls responded to within a response time goal. The average response time goal for urgent calls is ten minutes.[33] In the 2006-2007 fiscal year, the PAFD met their average response time goal for urgent calls with an average response time of seven minutes and 24 seconds.[34]

- *Non-Emergency Calls*. Non-emergency calls include noise complaints and other non-crime related issues. According to the PAPD, non-emergency calls are generally routine or report-type calls that can be handled as time permits. In the 2006-2007 fiscal year, 95 percent of non-emergency calls were responded to within 60 minutes. The average response time for non-emergency calls was 19 minutes and 26 seconds.[35]

As such, during the 2006-2007 fiscal year, PAPD's average response time goal was met for urgent calls; however, the goal for emergency calls was not met.

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28 City of Palo Alto, Police Department. Available at: http://www.city.palo-alto.ca.us/depts/pol/default.asp, accessed May 12, 2008.

29 The staffing ratio is calculated based on 2005 population of 58,598 as reported by the California Department of Finance.

30 Population numbers differ than those in the previous Fire Protection and Emergency Services discussion because the PAPD and PAFD have different service areas.

31 City of Palo Alto. 2008. *Service Efforts and Accomplishments Report 2006-2007*, Chapter 6 – Police, January.

32 City of Palo Alto. 2008. *Service Efforts and Accomplishments Report 2006-2007*, Chapter 6 – Police, January.

33 City of Palo Alto. 2008. *Service Efforts and Accomplishments Report 2006-2007*, Chapter 6 – Police, January.

34 City of Palo Alto. 2008. *Service Efforts and Accomplishments Report 2006-2007*, Chapter 6 – Police, January.

35 City of Palo Alto. 2008. *Service Efforts and Accomplishments Report 2006-2007*, Chapter 6 – Police, January.

These response times include dispatch times. The PAPD estimates that 96 percent of the emergency calls were dispatched within 60 seconds of receipt of the call and the target is 95 percent within 60 seconds.[36]

The current security system for the Main SUMC Site combines security personnel and electronic surveillance. An electronic security system provides visual surveillance using video cameras placed at various locations around the Main SUMC Site, particularly to observe entrances into the building and the Emergency Department. Video cameras also observe other locations around the SUMC facility.

Schools

The PAUSD serves the City and portions of the Town of Los Altos Hills. The PAUSD includes 12 elementary schools (kindergarten through grade five), three intermediate schools (grades six through eight), and two high schools (grades nine through twelve). Current enrollment in these facilities is presented in Table 3.14-1. According to the City's Board of Education, and as shown in Table 3.14-1, elementary schools have capacity for an additional 123 students, middle schools have capacity for an additional 95 students, and high schools have 239 available spaces. Therefore, PAUSD schools' classroom capacity can accommodate approximately 457 additional students.

Additionally, other schools and programs within the PAUSD include a pre-school program, a self-supporting adult school, a school for the hearing impaired, the Children's Hospital School at LPCH (located on the Main SUMC Site), and a summer school.[37]

In 2006, the PAUSD employed approximately 646 teachers, providing a ratio of one teacher for every 17.5 students.[38]

Parks and Recreation

The City's Department of Community Services provides parks and recreational services to its residents. City parks and recreational facilities are classified by their size, and service area, according to the following categories:[39]

- *Neighborhood Parks*. Parks that are typically 0.5 acre to 15 acres in size and are intended to serve residents within a 0.5-mile radius and are uninterrupted by non-residential roads or other physical barriers.[40] Neighborhood parks provide a mix of active and passive recreational areas and include elementary school play areas. Neighborhood parks include mini-parks, which are

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36 City of Palo Alto. 2008. *Service Efforts and Accomplishments Report 2006-2007*, Chapter 6 – Police, January.

37 Palo Alto Unified School District. Available at: http://pausd.org/parents/schools_sites/index.shtml, accessed December 26, 2007.

38 The staffing ratio is calculated based on 2006 student enrollment of 11,329 as reported by the Palo Alto Unified School District, Agenda, Regular Meeting, September 23, 2008.

39 City of Palo Alto. 1997. *Palo Alto Comprehensive Plan EIR*, September.

40 Greg Betts, Director of Community Services, City of Palo Alto Community Service. Electronic communication with PBS&J, October 25, 2007.

Table 3.14-1
Palo Alto Unified School District Enrollment (Number of Students) and Capacity as of 2008-2009 School Year

	Enrollment	Capacity[a, b, c]	Additional Capacity
Elementary Schools			
Addison	443	456	13
Barron Park	345	379	34
Briones	344	375	31
Duveneck	493	496	3
El Carmelo	371	372	1
Escondido	542	558	16
Fairmeadow	425	427	2
Walter Hays	506	518	12
Hoover	372	372	0
Nixon	434	442	8
Ohlone	475	479	4
Palo Verde	373	372	-1
Greendell (Young Fives)	40	40	0
Subtotal Elementary	*5,163*	*5,286*	*123*
Middle Schools			
Jordan	938	950	12
J.L. Stanford	917	950	33
Terman	650	700	50
Subtotal Middle School	*2,505*	*2,600*	*95*
High Schools			
Gunn	1,907	1,950	43
Palo Alto	1,754	1,950	196
Subtotal High School	*3,661*	*3,900*	*239*
Total	**11,329**	**11,786**	**457**

Source: PAUSD Board of Education, Agenda, Regular Meeting, September 23, 2008.

Robert Golton, Interim Co-Chief Business Officer, Palo Alto Unified School District. Electronic communication, December 12, 2008.

Notes:

a. Capacity numbers for kindergarten through 3rd grade are based on teachers' contracts with the PAUSD, which stipulate that each teacher will have a maximum of 20 students per class.

b. Capacity numbers for 4th and 5th grades are based on the PAUSD Board of Education's decision to load the classes with a maximum of 22 students.

c. Capacity numbers for middle schools and high schools are based on the PAUSD Board of Education's decision to set the maximum capacity of each school, as shown in the table.

typically from 0.5 acre to 2 acres in size and are intended to serve residents in the immediate walking vicinity. Mini-parks generally include children's playgrounds and/or grass and landscape areas for playing and sitting.

- *District Parks*. Parks that are typically 15 acres or greater in size and serve residents within a 0.5- to 3-mile radius.[41] District parks contain a wider range of facilities, including playing fields, picnic grounds, and community centers.

- *Open Space Preserves*. These large open spaces provide opportunities for hiking, biking, fishing, picnicking, camping, nature study, and non-motorized boating. These preserves also have significant ecological and aesthetic value, providing important habitat for wildlife and a scenic backdrop to the urban area.

The City owns and operates 17 neighborhood parks (including ten mini-parks), three district parks, and four natural open space preserves, totaling 24 parks and recreational facilities. The total approximate acreage of the parks, not including open space preserves, is 162 acres, including 101 acres of neighborhood parks and 61 acres of district parks.[42,43] The closest park to the SUMC Sites is El Camino Park neighborhood park, which is approximately 12.19 acres. El Camino Park occupies land owned by Stanford University and is leased by the City.

The following City parks are located within approximately 0.5 mile of the SUMC Sites:[44]

- El Camino Park, 12.19 acres (neighborhood, approximately 100 feet northeast of the SUMC Sites)

- El Palo Alto Park, 0.5 acres (neighborhood, approximately 0.1 miles northeast of the SUMC Sites)

- Cogswell Plaza, 0.5 acres (mini-park, approximately 0.3 miles northeast of the SUMC Sites)

- Lytton Plaza, 0.2 acres (mini-park, approximately 0.3 miles east of the SUMC Sites)
- Dr. Edith Johnson Park, 2.5 acres (neighborhood park, approximately 0.4 miles northeast of the SUMC Sites)

The City has an established standard of 2 acres of neighborhood and 2 acres of district parks per 1,000 residents.[45] The City does not have quantitative standards for providing open space preserves for its citizens. The City's 2007 population of 61,200 would necessitate the provision of approximately 122

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41 Greg Betts, Director of Community Services, City of Palo Alto Community Service. Electronic communication with PBS&J, October 25, 2007.

42 Greg Betts, Director of Community Services, City of Palo Alto Community Service. Electronic communication with PBS&J, November 25, 2007.

43 Mini parks are included in the total acres calculated for neighborhood parks.

44 City of Palo Alto. Available at: http://www.city.palo-alto.ca.us/civica/filebank/blobdload.asp?BlobID=8560, accessed November 25, 2007.

45 City of Palo Alto. 1997. *Palo Alto Comprehensive Plan EIR*, September.

acres of neighborhood parks and 122 acres of district parks.[46, 47, 48] Given that the City has 101 acres of neighborhood parks and 61 acres of district parks, there is an existing shortage of 21 acres of neighborhood parks and 61 acres of district parks.

In addition to a shortage of neighborhood and district parks, the City is currently experiencing a shortage in field space used for active recreation and athletic programs. Some neighborhood and district parks have field space for athletic programs. There are several neighborhood parks that were not originally designed to have field space for athletic programs that now have such fields. According to a report conducted by the City's Fields Advisory Committee in 2002, the City had approximately 77 total field sites (including neighborhood parks that were not originally designed or intended for athletic field space) that had to accommodate 60,000 annual hours of use. According to the report, an additional 100 acres of fields were needed as of 2002 to accommodate the City's need.[49] Although the six-acre Stanford-Palo Alto Community Playing Fields, opened in 2006, reduced that deficit, as of the preparation of this document, the City is still experiencing a deficit of active recreational field space.[50]

In addition to the deficit of playing fields, the proper maintenance of the fields is not being provided because of the high demand for and use of the fields. A major problem is that maintenance of the fields is severely impacted by demands from both scheduled and non-scheduled user groups.[51] The City conducted a *Parks and Community Facilities Impact Fee Study* that stated that approximately 13 percent of City park users are non-residential employees and approximately 40 percent of park users neither work nor live in the City. In addition, because of the high demand for and use of field space, the proper maintenance of the fields is not possible. A major problem is that maintenance of the fields is severely impacted by demands from both scheduled and non-scheduled user groups.[52] Therefore, the deterioration of parklands is further exacerbated by non-resident park users.[53]

Approximately 30 percent (4,763 acres) of the City's land area consists of open space preserves.[54] Open space preserves provide opportunities for hiking, biking, fishing, picnicking, camping, nature study, and non-motorized boating. They also have significant ecological and aesthetic value, providing important habitat for wildlife and scenic areas.[55] These major foothill open spaces include: the 1,940-

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46 City of Palo Alto. Available at: http://www.cityofpaloalto.org/, accessed January 7, 2008.

47 City of Palo Alto. Available at: http://www.city.palo-alto.ca.us/depts/pol/default.asp, accessed October 25, 2007.

48 Population numbers where used from the City's website to be consistent with the information about park acreage taken from the City's website.

49 City of Palo Alto, Palo Alto Fields Advisory Committee. 2002. *Report to the Palo Alto City Council*, December 5.

50 Greg Betts, Director of Community Services, City of Palo Alto Community Service. Electronic communication, August 13, 2008.

51 City of Palo Alto, Palo Alto Fields Advisory Committee. 2002. *Report to the Palo Alto City Council*, December 5.

52 City of Palo Alto, Fields Advisory Committee. 2002. *Report to the Palo Alto City Council*, December.

53 City of Palo Alto. 2001. *Parks and Community Facilities Impact Fee Study*, Prepared by: DMG-Maximus, September 18.

54 Greg Betts, Director of Community Services, City of Palo Alto Community Service. Electronic communication, October 25, 2007.

55 City of Palo Alto. 1997. *Palo Alto Comprehensive Plan EIR*, Chapter 5 Natural Environment, September.

acre John Fletcher Byxbee Recreational Area; the 1,400-acre Foothill Park; the 622-acre Pearson Arastradero Preserve; the 22-acre Esther Clark Park; the 12.4-acre Timothy Hopkins Creekside Park; the 2,200 acres of Montebello Open Space Preserve; and the 200-acre Los Trancos Open Space Preserve. The Byxbee, Foothill, Arastradero, Clark, and Hopkins Parks are owned and operated by the City, while Montebello and Los Trancos are operated by the Mid-Peninsula Open Space District.[56]

Regulatory Setting

Federal

There are no federal regulations related to public services that apply to the SUMC Project.

State

California Senate Bill 50 (SB 50). The passage of SB 50 in 1998 defined the Needs Analysis process in Government Code Sections 65995.5-65998. Under the provisions of SB 50, school districts may collect Level Two and Level Three fees to offset the costs associated with increasing school capacity in response to student enrollment increases associated with development. Level Two fees require the developer to provide one-half of the costs of accommodating students in new schools, while the State would provide the other half. Level Three fees require the developer to pay the full cost of accommodating the students in new schools and would be implemented at the time the funds available from Proposition 1A (approved by the voters in 1998) are expended. School districts must demonstrate to the State their long-term facilities needs and costs based on long-term population growth in order to qualify for this source of funding; however, voter approval of Proposition 55 on March 2, 2004, precludes imposition of the Level Three fee for the foreseeable future. Therefore, once qualified, the districts may impose only Level Two fees, as calculated per SB 50.

Local

City of Palo Alto Municipal Code, Section 16.58: Development Impact Fees for Parks, Community Centers, and Libraries. Development impact fees are to be accrued as of the date the first discretionary approval is given for the development, or if no discretionary approval is required, as of the date a complete application is submitted for a building permit for the development, and occupancy approval shall not be given until all fees are paid in full. This impact fee requires any new, non-residential development of 1,500 square feet or more to pay $3.849 per net new square foot for the maintenance, expansion, acquisition, and/or construction of parks, community centers, and libraries.

[56] Greg Betts, Director of Community Services, City of Palo Alto Community Service. Electronic communication, October 25, 2007.

Impacts and Mitigation Measures

Methodology

Public services addressed in this section are police and fire protection, emergency medical services, schools, and parks and recreation. The locations and capacity of the City's current public services providers were identified through review of City documents and maps, field reconnaissance, and direct communication with the City service providers.

Potential impacts on public services were evaluated by (a) assessing the potential for the SUMC Project to increase demand for public services based on goals established by service providers, and (b) comparing the ability of the service provider/public facility to serve the SUMC Project and accommodate the associated increase in demand. A determination is then made as to whether the existing service/facilities is capable of meeting the demand of the SUMC Project, and, if not, if expansion of existing service/facilities could cause an adverse environmental effect.

Standards of Significance

Based on significance thresholds determined by the City of Palo Alto, the SUMC Project would result in a significant public service impact if it would:

- Result in an adverse physical impact from the construction of additional fire, police, recreational or school facilities, such as stations, parks, or schools, in order to maintain acceptable performance standards; or
- 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.

Environmental Analysis

PS-1. Impacts Related to Fire Protection and Emergency Medical Facilities. The SUMC Project would require an increased level of fire and emergency services. However, the increased level of fire and emergency services would not be large enough to trigger the need for construction of new facilities, which could adversely affect the physical environment. Impacts would be less than significant. (LTS)

Construction of the SUMC Project would be completed in 2021; however, projected occupancy of the proposed structures would not be realized until 2025. By 2025, the floor area at the SUMC Sites would be about 3.7 million square feet, including a net increase of about 1.3 million square feet. The number of hospital beds, including beds at both SHC and LPCH, would increase by 248, from 713 to 961. Total on-site employment would increase by 2,243 employees.[57] In addition to the increased employment, the SUMC Sites would experience an increase in patient visits at full buildout.

The SUMC Project is an urban infill project that would not expand the service area of the PAFD (except for the 0.75-acre annexation, which is negligible) or extend travel routes between fire stations and service destinations. The SUMC Project would not result in a significant impact, per the City's significance criteria, because it would not necessitate the construction of fire protection facilities to maintain performance standards.[58] However, the SUMC Project would require additional demand for fire protection services due to increased floor area, population, and activity within the SUMC Sites. The additional demand would be substantial enough to necessitate additional staff and a new truck, both of which would be accommodated in existing facilities. According to the PAFD:

- The PAFD's current 75-foot ladder truck, which is the tallest ladder they have, would not have adequate reach and access for hose deployment for the increased height of buildings proposed by the SUMC Project.[59] With the SUMC Project, the maximum building height on the SUMC Sites would increase from 65 feet to 130 feet; and

- The PAFD predicts that calls from the SUMC Sites, as a result of the SUMC Project, would increase from 64 calls per year to 99 calls per year, an increase of 54.7 percent.[60, 61]

Due to the above, the PAFD has determined that, in order to provide adequate service to the SUMC Project and to its other obligations, the following steps must be taken:[62]

- At the time of SUMC Project buildout, as per the Stanford-PAFD agreement, replace the existing 75-foot ladder truck with a 100-foot ladder truck. A longer ladder truck is needed to provide adequate reach and access for the increased height of the buildings proposed in the SUMC Project; and

- Increase the 12-hour Medical unit to a 24-hour unit and add three full time employees. This increase in staff would improve the PAFD's ability to respond to the increased call volume that is expected with the SUMC Project.

Although the SUMC Project would require the above additional staff and equipment, it would not require the construction or expansion of fire protection facilities to house the staff and equipment. The PAFD's current stations (other than Station 1) have adequate capacity to

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57 Keyser Marston Associates, Inc., Final Proposed Stanford University Medical Center Expansion Housing Needs Analysis, prepared for the City of Palo Alto, September 2009, Table I-3.
58 Nick Marinaro, Fire Marshal, Palo Alto Fire Department, electronic communication November 19, 2008.
59 Dan Firth, Fire Marshal, Palo Alto Fire Department, electronic communication May 9, 2008.
60 Dan Firth, Fire Marshal, Palo Alto Fire Department. Electronic communication, May 9, 2008.
61 Call volume calculations are based of the current call volume to square foot ratio at the SUMC Sites. This ratio was then applied to the new square footage to estimate the new call volume.
62 Dan Firth, Fire Marshal, Palo Alto Fire Department. Electronic communication May 9, 2008.

accommodate the new truck and increase in staff.[63] Therefore, the SUMC Project would have a less-than-significant impact related to impacts from construction of new fire facilities.

It should be noted that the SUMC Project would construct its proposed structures to current Office of Statewide Health Planning and Development (OSHPD) and City Code standards for fire safety, and would install the latest fire control measures. As a part of the City's development review process, the State Fire Marshal would review the plans for the SUMC Project (including construction, fire service water main, and Automatic Fire Alarm System plans) to determine conformance with the Fire Code prior to issuance of a building permit. These requirements would help minimize risk of fire and consequent fire service demand from the SUMC Project.

It should also be noted that the SUMC Project would increase the availability of regional emergency medical services through expansion of the ED, the SHC, and the LPCH. It is anticipated the SUMC Project would provide added capacity for a growing emergency medical services demand in its service area. The proposed ED would have the capacity to treat approximately 1.4 times as many patients as the existing ED. The treatment area within the new ED would be 42,300 square feet, approximately 3.6 times larger than the existing area of 11,700 square feet. This increase in space would allow for greater patient volumes; therefore, it is anticipated that the number of ambulance trips and helicopter trips would grow by a similar proportion. As discussed in Section 2, the expansion would result in the annual patient visits increasing from 42,522 (117 per day) to 50,400 (138 per day) by 2015 and to 59,850 (164 per day) at full buildout in 2025. In addition, the expansion would result in approximately 11,731 total ambulance trips and 2,714 helicopter trips annually. A net increase of 3,400 ambulance trips and 594 helicopter trips would result annually from the expansion.[64] These improvements would improve the emergency services provided to the residents of the City, as well as the entire SUMC service area. The environmental impacts of the ED expansion are addressed in the various sections of this EIR.

IMPROVEMENT MEASURES. Although the SUMC Project would have less-than-significant impacts related to fire protection and emergency service, there are measures the City could encourage the SUMC Project sponsors to implement or consider imposing as conditions of approval. These measures would help reduce the equipment and staffing burden resulting from the SUMC Project.

- At the time of SUMC Project buildout, the SUMC Project sponsors should provide to the PAFD a 100-foot ladder truck to replace the existing PAFD 75-foot ladder truck.
- At the time of SUMC Project buildout, the SUMC Project sponsors should provide funding to the PAFD to increase the 12-hour Medical unit to a 24-hour unit and add three full time employees.

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63 Nick Marinaro, Fire Marshal, Palo Alto Fire Department. Electronic communication December 11, 2008.

64 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended.

PS-2. Impacts from Police Protection Facilities. The SUMC Project would require an increased level of police services. However, the increased level of police services would not be large enough to trigger the need for construction of new facilities, which could adversely affect the physical environment. Impacts would be less than significant. (LTS)

As discussed under Existing Conditions, the PAPD sets performance standards for emergency calls based on the percentage of calls that are responded to within six minutes, and the target is 90 percent. As mentioned under Existing Conditions, the PAPD responds to 73 percent of its emergency calls within six minutes. The PAPD sets performance standards for urgent calls based on the average response time of ten minutes. The average response time for urgent calls is seven minutes and 24 seconds. Non-urgent calls are generally routine or report-type calls that can be handled as time permits. Therefore, the PAPD currently does not meet its standards for emergency calls but does meet its standards for urgent calls.

The SUMC Project would not directly result in an impact per the City's significance criteria because it does not include construction of police stations to maintain performance standards. However, with development of the SUMC Project, the PAPD's emergency calls performance standard could be further impaired due to increased demand for police services associated with intensified site activity, new employment, increased hospital occupancy, increased amount of visitors, and increased square footage. The PAPD predicts that the SUMC Project would increase the number of traffic incidents and minor theft calls to which they would have to respond. The PAPD predicts that the calls in District 113 would increase from 1,229 calls per year to approximately 1,917 calls per year, an increase of 56 percent. The PAPD predicts that the calls in District 112, which includes the Hoover Pavilion Site, would increase from 1,692 calls per year to approximately 2,436 calls per year, an increase of 44 percent.[65] While the SUMC Project would increase the floor area ratio on site, the SUMC Project would not increase the area being patrolled, except for a minor, 0.75-acre annexation. An annexation of this size would not trigger the need for additional patrol vehicles or police staff.[66] According to the PAPD, the medical nature of the SUMC Project uses would average approximately two additional calls a day within the two districts (112 and 113), which would not significantly increase the response times of the PAPD such that new staff or equipment would be needed.[67] The PAPD would have sufficient staff and equipment to serve the increased demand that would result from the SUMC Project and the PAPD's facilities are sufficient to accommodate their current and future staff and equipment.[68]

The SUMC Project would also include security features for its new facilities; these features would supplement police patrol services already provided by the PAPD. As a part of the City's development review process, the PAPD would review plans and other safety features of

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[65] Ron Watson, Lieutenant, Palo Alto Police. Electronic communication with PBS&J, October 23, 2009.
[66] Peter Hazarian, Senior Administrator, Palo Alto Police Department. Electronic communication with PBS&J, January 24, 2008.
[67] Ron Watson, Lieutenant, Palo Alto Police. Handout given at meeting, May 5, 2008.
[68] Peter Hazarian, Senior Administrator, Palo Alto Police Department. Electronic communication with PBS&J, January 24, 2008.

the SUMC Project to ensure that safety standards are properly located and designed. As part of this process, additional safety and security measures could be added as the project design is refined; such additional features could include enhanced public safety radio frequency coverage, controlled access, intrusion barriers, additional security cameras, and/or area alarms in specific areas of the site and inside the buildings, where appropriate.

As stated above, demand from the SUMC Project would not require the PAPD to expand its existing facilities to house new staff and equipment. Therefore, the SUMC Project would have a less-than-significant impact related to construction of new police facilities.

PS-3. Impacts Related to School Facilities. An increase in students, which would require school expansions, would result as a tertiary impact of the SUMC Project, since increased employment from the SUMC Project could induce additional housing units within the City. Both the SUMC Project and induced housing projects would be subject to SB 50 School Impact Fees, which would mitigate impacts to less than significant. (LTS)

The SUMC Project would consist of expanded hospitals, medical offices, and replacement research/laboratory uses. It would not construct residential units that would generate more students to the PAUSD. The SUMC Project would involve the expansion of the LPCH School, which is a PAUSD facility within the LPCH. The SUMC Project would thus directly increase PAUSD capacity, but only for students who are patients at the LPCH. The environmental impacts of this expansion would be a small component of the total SUMC Project impacts, analyzed throughout this EIR.

Comments received during NOP review process requested consideration of indirect impacts on schools. As discussed in Section 3.13, Population and Housing, the SUMC Project would indirectly induce housing demand by increasing employment within the City. The SUMC Project would result in a demand of 1,303 new households.[69] Based on existing SUMC employee zip code data provided by Stanford (see also Appendix L),[70] it is estimated that approximately 104 households (approximately 8 percent) of housing demand generated by the SUMC Project would be located in the City (see Section 3.13 for a further discussion). The State has determined that housing units yield approximately 0.7 students per unit.[71] Applying this factor to the 104 units that would potentially be induced within the City, the indirect school demand that would be generated by the SUMC Project would be 73 students within PAUSD schools. As discussed under Existing Conditions, there is currently room for 457 additional students in the PAUSD, with middle schools having the least remaining capacity of 95 students.

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69 Keyser Marston Associates, Inc., Final Proposed Stanford University Medical Center Expansion Housing Needs Analysis, prepared for the City of Palo Alto, September 2009.

70 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended.

71 State of California Enrollment Certification/Projection, School Facility Program, Form SAB 50-01, http://www.documents.dgs.ca.gov/opsc/Forms/SAB_50-01.pdf, accessed August 13, 2008.

The 73 students generated from the SUMC Project, if evenly distributed between brackets; elementary (Kindergarten through 5th grade), middle school (6th through 8th grade), and high school (9th through 12th grade), would result in approximately 34 new students in the elementary schools, 17 new students the middle schools, and 22 new students in the high schools, and would not exceed remaining capacity. Although a number of schools are currently near or over capacity, it is PAUSD's policy that if a school reaches capacity, then students would be sent to the next closest school. A worst-case scenario in which all 73 students would be in middle school, but this would still not exceed capacity; expansion of school facilities is highly unlikely.

It should be noted that the actual generation of new students would be a tertiary impact of the SUMC Project. That is, the SUMC Project would directly increase employment. This employment is expected to generate housing demand, and thus induce more housing, a secondary impact. Construction of more housing units would generate more students, a tertiary impact. Because middle schools in the PAUSD only have capacity for an additional 95 students, the new housing could have a significant impact on schools due to the additional students (estimated at approximately 73 new students). The new students could require the expansion of school facilities, which could result in adverse environmental impacts.

Non-residential development, including the SUMC Project, is subject to SB 50 School Impact Fees (established by the Leroy F. Greene School Facilities Act of 1998). As a result of the wide-ranging changes in the financing of school facilities, including the passage of State school facilities bonds intended to provide a major source of financing for new school facilities, Section 65996 of the State Government Code explains that payment of school impact fees established by SB 50 is deemed to constitute full and complete mitigation for school impacts from development that may be required from a developer by any local or State agency.

In addition, the new residential development that may indirectly result from the increase in employment and that would generate students would be subject to separate CEQA review and would also be subject to residential school impact fees (which are higher than non-residential school impact fees). As a result, the tertiary impacts related to schools would be less than significant.

PS-4. Impacts Related to Construction of New or Altered Parks and Recreation Facilities. The SUMC Project would not result in the construction or expansion of new parks or fields, which would in turn result in adverse environmental impacts. The SUMC Project would be required to pay a City Community Facility Fee, which would be used to fund new parks or an alteration to an existing park, and would mitigate impacts to less than significant. (LTS)

The City does not have a policy or ordinance that would require the SUMC Project to include the construction of new, or physically altered, parks, fields, or other recreation facilities. As discussed further in Impact PS-5 below, per the City's Municipal Code, Section 16.58, the SUMC Project would be required to pay a City "Community Facility Fee," which has a line item that would fund acquisition of land and improvements for neighborhood and district parks (including playing fields).[72] The use of the Community Facility Fee to fund any particular new park or alteration to an existing park would be decided by the City, and such physical activities are not part of the SUMC Project.

Also, the SUMC Project would provide ample open space amenities. Because open space amenities are provided at the SUMC Sites and would be provided as part of the proposed facilities, it is not expected that a large number of SUMC employees would use nearby parks. Lastly, the sponsors of the SUMC Project would provide access to Stanford University's fields for SUMC employees. This access could potentially offset the demand for fields from new SUMC employees.

For the above reasons, impacts would be less than significant.

PS-5. Deterioration of Park and Recreation Facilities. Increased recreational demand from SUMC Project employees could accelerate the physical deterioration of the City's parks and fields. The SUMC Project would be required to pay a City Community Facility Fee, which reduce or avoid any such deterioration, and would mitigate impacts to less than significant. (LTS)

As stated in the Existing Conditions, the City currently experiences a shortage of 21 acres of neighborhood parks and 61 acres of district parks, based on its standard of 2 acres of neighborhood and 2 acres of district parks per 1,000 residents. In addition, the 2002 Field Study that was completed by City's Fields Advisory Committee states that the City has had an insufficient amount of playing fields to serve its population since 2002. In 2001, the City conducted a *Parks and Community Facilities Impact Fee Study*, which stated that approximately 13 percent of City's park users are non-residential employees and approximately 40 percent of park users neither work nor live in the City. Therefore, the deterioration of parklands is further exacerbated by non-resident park users.[73] While the SUMC Project would not construct housing units that would exacerbate the parkland/field to resident deficit, the SUMC Project can be assumed to result in additional park and field demand from employment. Because the City currently has a shortage of park and field space for active recreation use, additional demand from employees at the SUMC Sites could further exacerbate the deficit of field space.

As stated in the Existing Conditions, the proper maintenance of the fields is not being provided because of the high demand for and use of the fields. Based on the 2001 *Parks and Community Facilities Impact Fee Study*, increased employment at the SUMC Sites could result in increased use of existing neighborhood parks, particularly during the lunch hour or before or after shifts. New SUMC employees could utilize nearby parks during break hours or outside of work hours. While the SUMC Project would generate approximately 2,242 new employees, due to various shifts, employees would have lunch breaks at different times and only a fraction of

[72] The Community Facility Fee is a mix of the Park fee ($4.234 per net new square foot) + Community Center fee ($0.239 per net new square foot) + Libraries fee ($0.228 per net new square foot). Hence, the Parks line item of the fee is just part of the Community Facility fee.

[73] City of Palo Alto, *Parks and Community Facilities Impact Fee Study*, Prepared by DMG-Maximus, September 18, 2001.

daytime employees would potentially use park grounds for lunch or after work. In addition, visitors and patients are not expected to utilize nearby parks since their visits to the SUMC Sites are focused on the healthcare services offered by the SUMC Project.

El Camino Park, a 12.19-acre neighborhood park, about 0.6 mile north of the Main SUMC Site, is used by workers from local businesses and surrounding residents. It is possible that SUMC employees would utilize this park, particularly during lunch breaks due to its proximity to the SUMC Sites. Additional SUMC employees could also use El Palo Alto Park, Cogswell Plaza, Lytton Plaza, Dr. Edith Johnson Park, and citywide bicycle paths that run along most major roadways. Although farther away, these parks contain pathways, benches, and other socializing space that could attract employees. However, all these parks, except El Camino Park, do not provide turf or other facilities for active recreation.

As established by the City's Municipal Code, Section 16.58, the SUMC Project would be required to pay a Community Facility Fee, which has a line item for parks that would fund acquisition of land and improvements for neighborhood and district parks (which includes playing fields). The parks line item of the fee requires any new, non-residential development of 1,500 square feet or more to pay $4.234 per net new square foot.[74, 75] Payment of this fee is considered full mitigation for a project's exacerbation to the City's park land deficit, including playing fields.[76]

Also, the SUMC Project would provide walkways, open plazas, and landscaped areas for employees, patients, and visitors. The SUMC Project would expand the existing open space and pedestrian amenities on site to support the new facilities. The SUMC Project would incorporate new sections of open space and small grass fields. Given that ample open space amenities are and would be provided at the SUMC Sites, it is not expected that a large number of SUMC employees would use nearby parks.

Nonetheless, it can still be expected that some employees of the SUMC Project would seek to utilize City parks/recreational areas, based on the City's report that shows non-resident employees use City parks. However, the sponsors of the SUMC Project would provide access to Stanford University's fields for SUMC employees. This access would offset the potential deterioration new SUMC employees could cause on City parks. In addition, the SUMC Project would be subject to the City's taxes and program fees that support the City's General Fund, which finances the maintenance of City parks.

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74 City of Palo Alto. Municipal Code, Section 16.58, Building Regulations. Available at: http://nt2.scbbs.com/cgi-bin/om_isapi.dll?clientID=277797042&infobase=procode-3&softpage=Browse_Frame_ Pg, accessed January 14, 2008.

75 The Community Facility Fee is a mix of the Park fee ($4.234 per net new square foot) + Community Center fee ($0.239 per net new square foot) + Libraries fee ($0.228 per net new square foot). Hence, the Parks line item of the fee is just part of the Community Facility fee.

76 City of Palo Alto. Municipal Code, Section 16.58, Building Regulations. Available at: http://nt2.scbbs.com/cgi-bin/om_isapi.dll?clientID=277797042&infobase=procode-3&softpage=Browse_Frame_Pg, accessed January 14, 2008.

For the above reasons, impacts related to the deterioration of City parks would be less than significant.

Cumulative Analysis

The geographic context for this cumulative public and recreation services analysis is the service area of the service in question. For instance, the geographic context for cumulative impacts on police service and park/recreational facilities is the City, because these services are provided on a citywide basis and service ratios by which demand is estimated based on citywide figures. The fire protection service cumulative context area would be the cities of Palo Alto and Menlo Park, and the Town of Los Altos Hills, because these are the cities with which the PAFD has mutual-aid response agreements. Likewise, the cumulative analysis for impacts on schools would include the City and the Town of Los Altos Hills because the PAUSD serves these two municipalities.

PS-6. Cumulative Fire Protection Demand and Emergency Medical Facilities. Cumulative growth would increase demand for fire protection and emergency response services within the PAFD's service area; however, no new PAFD facilities would need to be constructed. Cumulative impacts would be less than significant. (LTS)

Cumulative development in the City of Palo Alto, and Menlo Park and Los Altos Hills (with whom the PAFD has mutual aid agreements), would include added residential, commercial, and industrial development. As discussed in the Existing Conditions, the PAFD does not currently meet its desired response time model and goals for fire emergency calls. While the City monitors staffing levels and facilities on an annual basis as part of the City's budgetary process and on an ongoing basis as individual development projects are proposed, cumulative development could increase the demand such that response times for service calls could not be maintained without additional equipment and/or facilities, the construction of which could result in environmental impacts.

In 2006-2007, the PAFD had one fire station for every 12,500 residents.[77] The population of the City is projected to increase by 15,100 between 2005 and 2025 according to the Association of Bay Area Governments; the City believes its population growth will be lower during that time (see Section 3.13, Population and Housing). In addition, Menlo Park and Los Altos Hills's populations are projected to increase by 4,900 and 700 residents, respectively, in this same time period (between 2005 and 2025).[78]

The PAFD is currently in the process of preparing a Standards of Coverage Plan and Emergency Medical Service (EMS) Master Plan, which will forecast future staffing levels and facilities needs. Currently, these plans are expected to reflect that the PAFD would hire

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77 City of Palo Alto, *Service Efforts and Accomplishments Report 2006-2007*, Annual Report on City Government Performance, Chapter 3 – Fire, January 2008.

78 Association of Bay Area Governments, *Projections 2005: Forecasts for the San Francisco Bay Area to the Year 2030*, 2004.

approximately six additional full-time personnel to operate a second medic van, and that the PAFD would not require additional facilities to meet future demand.[79]

The MPFD tries to maintain a 1 to 1,000 firefighter-to-resident ratio. As previously stated, Menlo Park's population is projected to increase by approximately 4,900 residents. This would require the MPFD to hire five additional full-time firefighters to maintain its 1 to 1,000 firefighter-to-resident ratio, which would likely not require the construction of new fire facilities. The MPFD stations have a lifespan of approximately 50 to 65 years. By 2025, Stations 2, 6, 1, and 4 are projected to be torn down, and reconstructed at their existing sites.[80] Reconstruction of the stations would be subject to their own CEQA review, and while potential impacts would be mitigated to the greatest extent feasible, there is no guarantee that significant and unavoidable impacts would not occur. However, these impacts would be associated with the MPFD's own building maintenance cycle, and would not be related to the City's increase in population within the PAFD service area, or MPFD's Automatic Aid Agreement with the PAFD.

Los Altos Hills's fire protection services are provided under contract by the Los Altos Hills County Fire District, which belongs to the Santa Clara County Fire Department, and is housed in County Fire Department Station 14 (El Monte Station). While the Santa Clara County Fire Department is currently drafting their latest business plan, the Departments current Business Plan (January 1, 2004 to January 1, 2008) states that Station 14 is in excellent condition (built in 1996), with no renovations scheduled.[81] Due to the station's current ability to service the population of Los Altos Hills, the station's current condition, and the relatively small increase of service population (700 residents between 2005 and 2025), there would likely be no need to construct additional fire facilities in Los Altos Hills.

As cumulative growth would not require the construction of additional PAFD facilities, cumulative impacts related to fire protection and medical emergency services would be less than significant.

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79 Roger Bloom, Deputy Fire Chief, Palo Alto Fire Department, telephone communication with PBS&J, November 17, 2009.

80 Harold Schapelhouman, Fire Chief, Menlo Park Fire Department, telephone communication with PBS&J, November 19, 2009.

81 Santa Clara County Fire Department, *Business Plan*. Accessed at: http://www.sccfd.org/forms/business_plan.pdf, accessed November 17, 2009.

PS-7. Cumulative Police Protection Demand. Cumulative growth in the City could necessitate construction of new or expanded police facilities in order to meet increased demand for services. Construction of new or expanded police facilities could result in significant environmental impacts. As such, cumulative impacts related to police service could be significant. However the SUMC Project's contribution to the cumulative need for new or expanded police facilities would be less than cumulatively considerable. (LTS)

The PAPD currently does not meet its standards for emergency calls but does meet its standards for urgent calls. Demand for police services can be expected to increase through 2025 due to increased activity in the City. According to the ABAG Projections 2005, the population of the City's sphere of influence is expected to increase by 15,100 people from 2005 to 2025.[82] In addition, employment in the City's sphere of influence is expected to increase by 13,210 employees during the same period.[83] The increased residential and employment population can result in increased emergency and urgent calls. In order to keep up with increased, cumulative demand in light of the current service deficit, the PAPD would need to acquire additional staff and equipment. The additional staff and equipment could necessitate expansions of existing police facilities or construction of new facilities.

In July 2007, the City certified an Environmental Impact Report for construction of a new Public Safety Building on Park Boulevard to replace the current station at 275 Forest Avenue. The current station does not meet essential standards for seismic safety. The new building would have had capacity for approximately the same number of officers as the current station and increased capacity for 52 patrol vehicles.[84] However, the City has currently suspended its plans and cancelled property option agreements for the new Public Safety Building.[85] Nonetheless, in the cumulative scenario, there would still be the potential need for construction of a new station due to increased demand, as well as structural conditions of the existing station. Construction of new or expanded police facilities could result in significant environmental impacts. As such, cumulative impacts related to police services could be significant.

The contribution of the SUMC Project to cumulative impacts related to police services would be less than cumulatively considerable. First, the SUMC Project would comprise a small portion of the projected growth through 2025. No new residents would directly result from the SUMC project. According to Section, 3.13, Population and Housing, the SUMC Project would indirectly result a demand for 104 housing units within the City of Palo Alto. According to ABAG Projection 2005, there would be approximately 2.5 residents per housing unit in Palo Alto.[86] This ratio yields that the SUMC Project could result in 260 new Palo Alto residents,

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82 Association of Bay Area Governments. *Projections 2005*.
83 Association of Bay Area Governments. *Projections 2005*.
84 City of Palo Alto. 2007. *Palo Alto Public Safety Building Project Final EIR*, July 11.
85 Steven Turner and Cara Silver, electronic communication with PBS&J, April 23, 2010.
86 Based on Tables 3.13-1 and 3.13-2 in Section 3.13, Population and Housing. 89,100 residents / 35,650 households in 2025 = 2.5 residents per household in 2025. The 260 new residents is regardless of employment.

which comprises 1.7 percent of the additional 15,100 residents through 2025. The 2,242 new full time equivalent employees from the SUMC Project would comprise about 17 percent of the total increase in employment through 2025.

Second, the SUMC Project is an urban infill project within an area that is already served by the PAPD. The SUMC Project would not add additional beats that the PAPD would need to patrol. While the SUMC Project would include annexation of a 0.75-acre property into City limits, this annexation would be a minor increase within Beat One and can be accommodated by current staffing and equipment levels. It should also be noted that the SUMC Project would provide increased connectivity between Sand Hill Road and Welch Road by extending Durand Way; this change would enhance police vehicle accessibility within Beat One and the SUMC Sites.

PS-8. Cumulative School Demand. Cumulative development in the City can be expected to necessitate expansion of school facilities, which could have adverse physical environmental impacts. This cumulative impact is conservatively assumed to be significant, although the SUMC Project's contribution to this cumulative impact would be less than cumulatively considerable. (LTS)

Cumulative development in the City and Town of Los Altos Hills would add new students to PAUSD schools. According to enrollment forecasts by the PAUSD, there would be approximately 15,189 students enrolled in 2021.[87,88] The projected 2021 enrollment would be 3,860 students more than the current enrollment of 11,329 students. These forecasts extend to 2021 only and do not project enrollment numbers for the cumulative analysis year of 2025. In addition, this forecast only factors in known development projects at the time of the study's completion, in December 2008, and does not include new development that has been planned since then, including the SUMC Project. Current school capacity for the PAUSD is 11,786; therefore, school facilities would need to be expanded to serve the projected 15,189 students plus additional students that have not been accounted for in the projections.[89] As such, an expansion in school facilities can be assumed at 2025. Expansion of school facilities could result in adverse environmental impacts.

Resolution No. 2007-08.10 was passed by the City's voters in 2008, which would allow the PAUSD to sell bonds to the public, and the funds generated from this activity would be used to construct and improve school facilities. Resolution No. 2007-08.10 includes a Bond Project List, which lists a number of proposed improvement projects to school facilities. This list

87 *District-wide Enrollment Forecasts Palo Alto Unified School District*, Prepared by Lapkoff & Gobalet Demographic Research, Inc., December 15, 2008.

88 As advised by the PAUSD's demographer Lapkoff & Gobalet Demographic Research, Inc., the average of two forecasts was used to arrive at the enrollment forecasts for 2021. The total number of students enrolled under the Medium Forecast Scenario: Number of Births Remains Constant Post 2011 (13,872) and High Forecast Scenario: Number of Births Increase 10 Percent Post 2011 (16,505), were averaged to get 15,189 students.

89 *PAUSD 11th Day Enrollment 2008-2009*. September, 2008.

includes the construction of new permanent classrooms and classroom buildings to accommodate enrollment growth and expanded programs.

As previously discussed, Section 65996 of the State Government Code explains that payment of school impact fees established by the Leroy F. Greene School Facilities Act of 1998 is deemed to constitute full and complete mitigation for school impacts. PAUSD has enacted development fees in accordance with the Leroy F. Greene School Facilities Act and levies these fees on development projects within its service area. Cumulative projects would be required to pay the school impact fees, which are based on the amount of proposed residential and commercial space. An expansion of school facilities can be assumed to meet demand in 2025, the physical impacts of which are not known at this time. This cumulative physical impact is conservatively assumed to be significant.

The SUMC Project would not directly contribute new students to cumulative enrollment growth of 3,560 more students. On a tertiary level, the SUMC Project would add 73 students to the school system. This contribution of 73 students would not be a considerable contribution to the cumulative enrollment growth that is assumed to necessitate construction of new facilities, resulting in a less than cumulatively considerable contribution.

PS-9 *Cumulative Demand for Parks and Recreation Facilities, and for New Parks. Cumulative impacts related to park deterioration would be less than significant due to the City's Community Facility Fee. Cumulative growth in the City would necessitate acquisition or development of new parklands, which could result in significant environmental impacts; however, the contribution of the SUMC Project to this cumulative impact would be less than cumulatively considerable. (LTS)*

Cumulative Parkland Deterioration. According to the ABAG Projections 2005, the population of the City's sphere of influence is expected to increase by 15,100 people from 2005 to 2025.[90] In addition, employment in the City's sphere of influence is expected to increase by 13,210 employees during the same period.[91] As indicated under Existing Conditions, the proper maintenance of the playing fields is not being provided because of the high demand for and use of the fields. The cumulative increase in population and employment in the City could further increase demand for and use of parklands, and contribute to further deterioration of the City's playing fields.

However, per the City's Municipal Code, Section 16.58, cumulative development projects would be required to pay a City Community Facility Fee, which has a line item that would fund improvements for neighborhood and district parks (including playing fields). The Community Facility Fee would provide funding towards park maintenance, including fields, and would offset deterioration from cumulative growth. Cumulative impacts related to park deterioration would be less than significant due to the fee.

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90 Association of Bay Area Governments. *Projections 2005*.
91 Association of Bay Area Governments. *Projections 2005*.

The above notwithstanding, it should be noted that the sponsors of the SUMC Project would provide access to Stanford University's fields for SUMC employees. This access would offset the potential deterioration new SUMC employees could cause on City parks. In addition, the SUMC Project would be subject to the City's taxes and program fees that support the City's General Fund, which finances the maintenance of City parks. These factors would reduce any contribution from the SUMC Project towards parkland deterioration from cumulative growth.

Cumulative Impacts Related to Construction of New Parks. While conversion of existing parkland is not envisioned by the City to meet its cumulative development demand, the above mentioned cumulative increase in population and employment in the City would further exacerbate the City's current parks deficit of 88 acres of parkland as well as its deficit of fields used for active recreation. To comply with the City's goal of 2 acres of neighborhood parks and 2 acres of district parks per 1,000 residents, the City would have to add an additional 30.2 acres of neighborhood parks and 30.2 acres of district parks to serve the additional 15,100 residents by 2025. This additional acreage would not alleviate the current deficit, but maintain the status quo.

The City's Municipal Code, Section 16.58, would require all cumulative development to pay a Community Facility Fee, which would be used to purchase, construct, and improve parklands, and would reduce cumulative impacts on the deficit of parks and recreational facilities in the City. However, given the current deficit, the likelihood of acquisition and/or development of 30.2 acres of neighborhood parks and 30.2 acres of district parks is currently speculative, and the physical impacts of the parkland development are also speculative. Nonetheless, this analysis conservatively assumes that the parklands would be acquired or developed, and that significant environmental impacts would result in the cumulative scenario.

According to Section, 3.13, Population and Housing, the SUMC Project would result a demand for 104 housing units within the City of Palo Alto. According to ABAG Projections 2005, there would be approximately 2.5 residents per housing unit in Palo Alto.[92] This ratio yields that the SUMC Project could result in 260 new Palo Alto residents, which is about 1.7 percent of the additional 15,100 residents through 2025 that would further exacerbate the parkland deficit. As such, the SUMC Project's contribution to the cumulative impact related to construction or new parks would be less than cumulatively considerable.

[92] Based on Tables 3.13-1 and 3.13-2 in Section 3.13, Population and Housing. 89,100 residents / 35,650 households in 2025 = 2.5 residents per household in 2025. The 260 new residents is regardless of employment.

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3.15 UTILITIES

Introduction

The SUMC Project would result in increased on-site employment, visitorship, and developed floor space. These increases have the potential to create greater demand for utilities, including water supply, wastewater collection and treatment, storm drainage, solid waste disposal, and energy (which includes electricity and natural gas). This section assesses whether the potential increase in demand would overtax, to a significant degree, the capacity of the infrastructure systems serving the SUMC Sites. Information regarding the existing and projected demand within the SUMC Sites has been collected from the City of Palo Alto Utilities Department (CPAU), the sponsors for the SUMC Project, and other applicable sources.

Issues identified in response letters to the NOP, and during the Planning and Transportation Commission and City Council public scoping meetings for the SUMC Project, were considered in preparing this analysis. The majority of comments provided in response letters and meetings pertain to impacts on water supply. Water supply comments include the need to conduct a water supply assessment, potential impacts on the Hetch Hetchy water system, recommendations for water conservation techniques, and the need to evaluate the potential use of recycled water. Other comments pertain to the SUMC Project's recycling and disposal programs and compliance with the City's Zero Waste Strategic Plan. Such comments were received from the Palo Alto Planning and Transportation Commission, City Council, City of Palo Alto Public Works, the Crescent Park Neighborhood Association, and private individuals and organizations. These comments were considered in the preparation of this analysis. It should be noted that one NOP comment inquired about placement of a new Hetch Hetchy pipeline to serve the Santa Clara Valley Water District (SCVWD). Such an action is beyond the scope of the SUMC Project being evaluated in this EIR and would be under the jurisdiction of the San Francisco Public Utilities Commission (SFPUC) rather than the City of Palo Alto.

As discussed in Section 2, Project Description, during the construction of the SUMC Project, some utility lines would be capped, rerouted, or replaced and new utility lines would be needed to serve the increased demand from the SUMC Project. The improvements to the utility distribution system would require trenching and construction activity, which could have impacts relating to noise, air quality, traffic circulation, cultural resources, biological resources, and hydrology. Impacts relating to construction activity, including construction of the utility infrastructure, are assumed in the construction analysis presented in each of the technical sections of this EIR, where appropriate. Besides those construction activities described in the SUMC Project Description, no additional off-site construction relating to utilities would occur. This section analyzes the utility demand of the SUMC Project to determine if additional infrastructure is required, the construction of which could result in additional environmental impacts.

Existing Conditions

Water Supply

City of Palo Alto Water Demands and Demand Management Measures. Water use in the City is dominated by residential uses, but also includes significant use by commercial, industrial, City facility, and public facility customer classes, as shown in Table 3.15-1. The table also shows the City's projections of future water use in millions of gallons per day (mgd), prior to additional demand management measures and without implementation of the SUMC Project.

Table 3.15-1
City Demand Projections by Customer Sector

Use by Account Type (mgd)	2005[a]	2010	2015	2020	2025	2030
Single-Family Residential	5.86	5.91	5.95	6.00	6.00	6.02
Multiple-Family Residential	1.99	2.00	1.99	1.99	1.98	1.97
Commercial	2.37	2.34	2.33	2.31	2.31	2.31
Industrial	1.24	1.26	1.28	1.29	1.30	1.32
City Facilities	0.56	0.58	0.59	0.61	0.62	0.62
Public Facilities	0.35	0.36	0.37	0.38	0.38	0.39
Unaccounted For Water[b]	0.98	0.98	0.98	0.98	0.98	0.98
Total[c]	13.36	13.42	13.48	13.56	13.57	13.60

Source: PBS&J, 2009, developed from City of Palo Alto Utilities *2005 Urban Water Management Plan*.

Notes:

a. 2005 projections represent an average use and are not representative of 2005 actual use.

b. Based on City of Palo Alto Utilities *2005 Urban Water Management Plan*. This does not reflect actual losses.

c. Total does not reflect additional demand management measures, which are water conservation programs that the City intends to implement in order to reduce the potable water demands within Palo Alto.

The City's projections of water use are based on the SFPUC's 2004 Wholesale Customer Water Demand Projections Study (Demand Study), which analyzed water demands associated with each customer sector and then forecasted demands over a 25-year planning horizon. The Demand Study evaluated demands in each of the SFPUC's wholesale customers' service areas using data provided by the wholesale customers; this provided a uniform way for demands within SFPUC to be analyzed. The projections were developed using an "End Use" model, which initially establishes a base-year water demand at the end-use level (such as toilets and showers) and calibrates the model to initial conditions, and then forecasts future water demand based on projected demands of existing water service accounts and future growth in the number of service accounts. The forecasts incorporate the effects of existing demand management (conservation) measures, including the effects of plumbing and appliance code provisions, but do not incorporate the effects of the City's planned additional demand management measures as addressed later in this section.

The City projects its total number of customer accounts would increase by more than 10 percent from 2005 to 2030. However, the City also projects that existing demand management measures would continue to reduce demand per account. Although the number of total accounts would increase, the reduced demand per account means the City's overall potable water demand would increase by only two percent from 2005 to 2030.[1]

The City has projected growth within its service area, and has included its projections in the *2005 Urban Water Management Plan* (UWMP). The SUMC Project demand is considered hospital use and not commercial and was not accounted for in the City's 2005 UWMP. The net increase in demand from the SUMC Project is considered new demand in excess of the City's existing and planned demands.

In addition to the historical conservation measures included in the above water demand projections, the City has adopted a Demand-Side Management (DSM) Program to further reduce water purchases from SFPUC by four percent by the year 2030. The DSM Program is discussed further in the City's 2005 UWMP (available for review at the City Utilities Department). Table 3.15-2 includes the projected future demand with DSM through 2030 for the City.

Table 3.15-2
Demand Projections with Planned Demand-Side Management (mgd)

	2005	2010	2015	2020	2025	2030	2005 to 2030 Change
Total City Demand without Project[a]	13.36	13.42	13.48	13.56	13.57	13.60	2%
Demand Reduction (DSM Program)[b]	-0.13	-0.37	-0.51	-0.56	-0.59	-0.60	
Total City Demand with DSM	**13.23**	**13.05**	**12.97**	**13.00**	**12.98**	**13.00**	**-2%**

Source: PBS&J, 2009, developed from the City of Palo Alto *2005 Urban Water Management Plan*.
Notes:
a. City demand includes unaccounted for water, but not conservation estimates.
b. Based on City of Palo Alto Utilities *2005 Urban Water Management Plan*, p. 38.

City of Palo Alto Water Supply. The City purchases the majority of its potable water from SFPUC. Palo Alto's Individual Supply Guarantee (ISG) is 17.07 mgd; this is its share of the 184 mgd allocated for the Bay Area Water Supply and Conservation Agency (BAWSCA) members. The 2005 UWMP projected that the City's purchases would be approximately 13.00 mgd from SFPUC in 2030.

Table 3.15-3 shows SFPUC's water allocations for all BAWSCA members in total and for the City individually, as presented in SFPUC's and the City's 2005 UWMPs. The table shows allocations for normal years, single dry years, and multiple dry year events. The City's projected water consumption through 2025 includes planned demand management measures.

[1] City of Palo Alto Utilities, *2005 Urban Water Management Plan*, pp. 32-33, 2005.

Table 3.15-3
SFPUC Allocations to Palo Alto 2005 / 2025 in Normal, Dry and Multiple Dry Years[a]

	Normal Year		One Critical		Multiple Dry Year Event					
	Purchase Request		Dry Year		Year 1		Year 2		Year 3	
	mgd	%	mgd	%	mgd	%	mgd	%	mgd	%
2005										
BAWSCA	177.9	100%	153.7	86.4%	153.7	86.4%	133.4	75.0%	133.4	75.0%
Palo Alto	13.23	100%	12.02	90.9%	12.02	90.9%	10.44	79.0%	10.44	79.0%
2025										
BAWSCA	184.0	100%	152.6	83.0%	152.6	83.0%	132.5	72.0%	132.5	72.0%
Palo Alto	12.98	100%	12.11	93.3%	12.11	93.3%	10.57	81.3%	10.57	81.3%

Source: PBS&J 2007, as developed from SFPUC *2005 Urban Water Management Plan*.
Note:
a. Dry year reductions based on SFPUC *2005 Urban Water Management Plan*, Appendix C: Water Shortage Allocation Plans. Assumes implementation of SFPUC's Water System Improvement Plan.

The Interim Water Shortage Allocation Plan governing how available water in a water shortage situation is allocated between San Francisco and the BAWSCA agencies and how the allocation to the entirety of the BAWSCA agencies is divided among the BAWSCA agencies expired on June 30, 2009. The new 25-year Water Supply Agreement, which went into effect on July 1, 2009, stipulates how available water is allocated in a water shortage between San Francisco and the BAWSCA agencies, but not how the water is divided up among the BAWSCA agencies. Under the new Water Supply Agreement, the allocation between San Francisco and the BAWSCA agencies for water shortages of up to 20 percent remains unchanged from the old water contract.

The formula to divide water between the BAWSCA agencies is pending negotiations between the parties. These negotiations could result in changes to the supply allocations and dry-year allocation formulas. The effect of these changes on the City's allocations is uncertain at this time. If the changes result in reduced drought-time allocations to the City, the City would need to take additional steps to balance supplies with demands, possibly including additional long-term conservation measures and additional utilization of its Water Shortage Contingency Plan which is a part of its UWMP. The need for these additional steps is speculative at this time.

The supply numbers presented in Table 3.15-3 are predicated upon the assumption that SFPUC will achieve its plans to expand recycled water programs, improve conjunctive groundwater uses, and/or increase diversions from the Tuolumne River.[2] These additional supplies, which are necessary to meet

2 San Francisco Public Utilities Commission, *Urban Water Management Plan for the City and County of San Francisco*, pp. 22-29, 2005.

increased demands in the future, are outlined in SFPUC's Water System Improvement Program (WSIP). The WSIP is a multiple year, system-wide capital improvements program aimed at improving the SFPUC's ability to meet its water service goals. Many aspects of the WSIP are rooted in SFPUC's 2000 Water Supply Master Plan and various water system vulnerability studies.

SFPUC's Water System Improvement Program. SFPUC prepared a Program Environmental Impact Report (PEIR) for the WSIP. Each qualifying project under the WSIP would be subject to specific environmental review and would result in preparation of a CEQA environmental document. Each project would also be reviewed for compliance with any necessary local, State, and federal permitting requirements. The water supply improvement options investigated in the PEIR include:

1) SFPUC Regional Water System Conjunctive Use Program: South Westside Groundwater Basin.
2) SFPUC Regional Water System Water Transfers from the Tuolumne River Districts.
3) SFPUC Regional Water System Recovery of Storage: Restoration of Calaveras and Crystal Springs Reservoirs.

The WSIP also investigated the potential options of developing local water resources, such as water recycling, groundwater, desalination, and improved conservation, to meet SFPUC purchase requests or demands. These resources, which are expected to provide an additional 10 mgd, are potential opportunities that exist throughout the regional water system and could be used to meet customer demands over the next 25 years.[3]

On October 30, 2008, the San Francisco Planning Commission certified the Final PEIR for the WSIP. At the same time, the SFPUC approved the WSIP including an Interim Water Supply Limitation, which limits water delivered from the SFPUC regional water system to 265 mgd by 2018. Of the 265 mgd limit, the BAWSCA agency limitation is 184 mgd. Individual qualifying projects are still subject to project-level CEQA review.

Emergency Water Supply and Storage. The City has approved the development of its Emergency Water Supply and Storage Project (EWSS), which would develop groundwater capacity for use during water supply emergency conditions. The EWSS project would also provide the City the ability to use groundwater during dry years, to partially supplement dry-year supplies from SFPUC. Such use in any given year would be at the discretion of the City Council, with the Council also having the option of increasing demand reduction targets in lieu of using groundwater. This document assumes that the City will use groundwater during multiple dry-year droughts, in addition to dry-year demand reductions, to maintain a positive supply for the City.

In 2002, Carollo Engineers conducted a Groundwater Supply Feasibility Study to "evaluate whether operating one or two of the City's water wells as active supplies would cause significant decrease in groundwater levels or deterioration in groundwater quality." The study, completed in April 2003,

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3 San Francisco Public Utilities Commission, *Urban Water Management Plan for the City and County of San Francisco*, p. 22-24, 2005.

concluded that producing 500 acre-feet per year (AFY) (0.45 mgd) of water from the wells on a continuous basis or 1,500 AFY (1.34 mgd) on an intermittent basis, such as during a drought year, would not result in subsidence, saltwater intrusion, or migration of contaminated plumes. One well producing 1,000 gallons per minute (gpm) would provide 1,500 AFY. Thus, only one or two wells would need to be operated to provide the water quantities identified, if the City Council decided to operate the wells during droughts or on a continuous basis. Currently, the existing wells are only operated once a month to flush the well, verify proper operation of the equipment and to test the quality of the groundwater.

The City completed an EIR for the EWSS projects to improve the distribution system reliability recommended in the 1999 Study (rehabilitation of the existing wells, siting new wells and reservoir facilities). The EIR was certified in March 2007 and is available for review from the City Utilities Department.[4] Mitigation measures were included in the EIR to ensure potential impacts to the groundwater basin would be less than significant. These mitigation measures include aquifer testing for all new and rehabilitated wells. Additional mitigation requires restricted groundwater production following emergency pumping until groundwater levels recover to pre-pumping levels.[5]

Water Shortage Contingency Plan. In addition to the Demand Management Measures, the City has developed a Water Shortage Contingency Plan as part of the UWMP to address possible dry-year reductions in supply from SFPUC. The Contingency Plan includes four stages, to be implemented progressively as needed. The 2005 UWMP describes these stages as follows:

- Stage I (5% to 10% supply reductions) calls for a low level of informational outreach and enforcement of the permanent water use ordinances.
- In Stage II (10% to 20%) there will be a stepped up outreach effort and the adoption of some additional water use restrictions. Drought rate schedules will be implemented.
- Stage III (20% to 35%) calls for increased outreach activities and additional emergency water use restrictions. Drought rates in each block would increase from those in Stage II. Fines and penalties would be applied to users in violation of water usage restrictions. In some cases, water flow restriction devices would be installed on customers' meters.
- Stage IV (35% to 50%) requires very close management of the available water supplies. Allocations of water for each customer will be introduced. Informational outreach activities would be operating at a very high level. Severe water use restrictions and a restrictive penalty schedule would be implemented.

The UWMP also notes the City's history of having successfully achieved necessary demand reductions during past drought events, including the 1990-93 drought when the City's customers achieved demand reductions of up to 35 percent.

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4 City of Palo Alto. 2005. *Emergency Water Supply and Storage Final EIR*, available at http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=8372, accessed January 26, 2009.

5 ESA, *City of Palo Alto Emergency Water Supply and Storage Project, Draft Environmental Impact Report*, p. 3.5-20, November 2006.

In considering the potential for dry-year demand reductions, the City notes that these reductions would be over and above long-term conservation savings already achieved in the City, and additional planned long-term conservation savings. The historical and continuing implementation by the City and its customers of water conservation measures results in an effect referred to as "demand hardening." Demand hardening occurs where implementation of long-term conservation reduces the potential of short-term measures to effect significant reductions in water use.

Supply-Demand Balance. During years of above-normal and normal water supplies, the City has sufficient supplies to meet its normal demands. During single and multiple dry year events, City water supplies from SFPUC are insufficient to meet normal demands. These supply deficiencies can be met with the implementation of the WSIP, EWSS projects, and dry year demand reductions in accordance with the Water Shortage Contingency Plan (WSCP).

The City plans to implement its WSCP in progressive stages as needed to achieve a balance of supplies and demands. For the conditions shown in Table 3.15-4, this results in demand reductions of up to 10 percent in a single dry-year and up to 20 percent in subsequent years of a multiple-dry-year event. These reduction levels correspond to implementation Stages I and II, respectively, of the City's WSCP.

Table 3.15-4
City of Palo Alto Supply-Demand Balance with Dry-Year Demand Reductions

	Normal Year[a]		**One Critical Dry Year**[b]		**Multiple Dry Year Event**[c]					
					Year 1		**Year 2**		**Year 3**	
2025	**mgd**	**%**	**mgd**	**%**	**mgd**	**%**	**mgd**	**%**	**mgd**	**%**
SFPUC Projected Allocation	12.98	100%	12.11	93.3%	12.11	93.3%	10.57	81.3%	10.57	81.3%
Emergency Groundwater	0.00		0.00		0.00		0.45		0.45	
Palo Alto Normal Demand[d]	12.98		12.98		12.98		12.98		12.98	
Dry-Year Demand Reduction[e]		0%		10%		10%		20%		20%
Palo Alto Reduced Demand	12.98		11.68		11.68		10.38		10.38	
Surplus/ (Deficit)	0.00	0%	0.43	3.7%	0.43	3.7%	0.64	6.0%	0.64	6.0%

Source: PBS&J, 2009, developed from City of Palo Alto Utilities *2005 Urban Water Management Plan* and SFPUC *2005 Urban Water Management Plan*.

Notes:

a. Normal year SFPUC Projected Allocation set equal to the City of Palo Alto's Individual Supply Guarantee (ISG). In a normal year, SFPUC is able to supply up to the maximum SA for all wholesale customers (this assumes the City of Hayward and others with the ability to grow beyond their SA will remain within their current SA through 2030). SFPUC will not deliver more water than needed to meet demands.

b. Dry year reductions based on SFPUC 2005 Urban Water Management Plan, Appendix C: Water Shortage Allocation Plans.

c. Average annual demand. Based on linear increase in demand from mid-2009 to 2015.

d. Palo Alto demand includes Demand Side Management and 0.98 mgd system loss per City of Palo Alto Utilities 2005 Urban Water Management Plan, p. 36. This does not reflect actual unaccounted for water.

e. Dry-Year demand reductions are in addition to ongoing conservation measures.

The EWSS projects would also provide the City the ability to use groundwater during dry years, to partially supplement dry-year supplies from SFPUC. Such use in any given year would be at the discretion of the City Council, with the Council also having the option of increasing demand reduction targets in lieu of using groundwater. Table 3.15-4 shows the City's supply and demand balance assuming 500 AFY (0.45 mgd) of groundwater is available in Years 2 and 3 of a multiple dry year event to supplement SFPUC deliveries. Groundwater would be pumped from existing rehabilitated wells or from a new well sited at El Camino Park, as discussed in the EIR for the EWSS.[6]

Assuming the implementation of the WSIP and EWSS projects, the City has adequate supply for its projected demands without exceeding SFPUC projected allocations or the City's SFPUC ISG.

SUMC Existing Water Demand and Conservation. The existing SUMC Sites have a current water demand of approximately 362,000 gallons per day (gpd).[7] The SUMC Project sponsors are committed to implementing various water conservation policies and measures in accordance with green building requirements and goals. The SUMC Project sponsors have implemented ongoing water conservation measures at the SUMC, and these conservation measures are discussed further under Impact UT-1.

Wastewater

The CPAU oversees a wastewater collection system consisting of over 202 miles of sewer lines.[8] Wastewater effluent from the SUMC Sites is routed to the Palo Alto Regional Water Quality Control Plant (RWQCP), where it is treated prior to discharge into the San Francisco Bay.

While the CPAU is responsible for the wastewater collection system, the Palo Alto Public Works Department is responsible for the collection/conveyance of sewage collected and delivered to the RWQCP. In addition to serving the City, the RWQCP serves Mountain View, East Palo Alto, Stanford University, Los Altos, and Los Altos Hills. The RWQCP provides tertiary treatment, including primary and secondary treatment, final filtration, and disinfection.[9] Treated effluent is discharged to the San Francisco Bay. The RWQCP is designed to have an average dry weather flow (ADWF) capacity of 39 mgd and an average wet weather flow capacity of 80 mgd.[10] According to the City, the RWQCP does not experience any major treatment system constraints and has no planned capacity expansions.[11]

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6 Any use of groundwater during dry years would require approval from the Palo Alto City Council.

7 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-2.

8 City of Palo Alto Utilities, *All About Your Utilities*, 2007, available at http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=8248, accessed March 11, 2008.

9 The sewage treatment involves three stages, primary (mechanical), secondary (biological), and tertiary treatment (filtration and ultraviolet radiation). First, the solids are separated from the wastewater stream. Then dissolved biological matter is progressively converted into a solid mass by using water-borne microorganisms. Finally, the biological solids are neutralized then disposed of or re-used, and the treated water may be disinfected chemically or physically (for example by lagoons and micro-filtration).

10 Rick Wetzel, Manager, Water Quality Control Plant in the Public Works Department, City of Palo Alto, electronic communication with PBS&J, November 26, 2007.

11 Rick Wetzel, Manager, Water Quality Control Plant in the Public Works Department, City of Palo Alto, electronic communication with PBS&J, November 26, 2007.

In 2005, the RWQCP processed approximately 28 mgd of wastewater, or 72 percent of its ADWF capacity.[12] In 2007, 15.3 mgd (39 percent of the ADWF capacity of the treatment plant) was allocated to Palo Alto.[13] The City of Palo Alto's allocation of 15.3 mgd includes 2.11 mgd which is allocated to the "Stanford University Campus," but this refers to portions of the campus that are outside the City of Palo Alto—primarily lands in unincorporated Santa Clara County. Excluding Stanford University's allocation, the City is allocated 13.2 mgd. In the 2006 to 2007 fiscal year, the average annual flow (AAF) for Palo Alto (excluding the "Stanford University Campus" use) was 9.3 mgd.[14] This AAF represents 71 percent of the 13.2 mgd capacity allocated to the City. In other words, the City's current average annual wastewater generation is 29 percent less than its allocation. According to the City of Palo Alto, the City would not reach its allocated capacity in the foreseeable future.[15] Projected ADWF plant flow in 2025 is estimated to be 30 mgd or 77 percent of the RWQCP's ADWF capacity, based on the projection of the City's UWMP.[16]

Because the SUMC Sites are within City boundaries, the SUMC Sites' wastewater flow is part of Palo Alto flow, not "Stanford University Campus" flow. Existing flow from the SUMC Sites is 0.31 mgd AAF.[17]

Stormwater

Palo Alto's storm drainage system contains over 550,000 linear feet of pipelines, ranging in size from 8 to 96 inches.[18] The storm drains collect stormwater and convey it primarily to San Francisquito, Matadero, Barron, and Adobe creeks. These creeks ultimately discharge the stormwater to San Francisco Bay. The SCVWD oversees County-wide programs for flood protection and stormwater management. For local lines that connect to the creeks, the City maintains a Storm Drain Master Plan that recommends improvements to be made over a 30-year horizon.

Stanford University owns and operates its own storm drain system, which primarily serves the Stanford University campus. This private network, which is not owned or operated by the City of Palo Alto, serves the Main SUMC Site. Stormwater from the Main SUMC Site is collected along Sand Hill Road and is released into San Francisquito Creek through a 90-inch outfall.

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12 City of Palo Alto, Department of Utilities, *2005 Urban Water Management Plan*, 2005, available at http://www.cityofpaloalto.org/cityagenda/publish/uac-meetings/documents/Item1_DraftforUACandPublicReview_000.pdf, accessed March 11, 2008.

13 James Allen, Senior Engineer, Palo Alto Regional Water Quality Control Plant, electronic communication with PBS&J, January 28, 2008.

14 James Allen, Senior Engineer, Palo Alto Regional Water Quality Control Plant, electronic communication with PBS&J, January 28, 2008.

15 Rick Wetzel, Manager, Water Quality Control Plant in the Public Works Department, City of Palo Alto, electronic communication with PBS&J, November 26, 2007.

16 City of Palo Alto Utilities, *2005 Urban Water Management Plan*, December, 2005.

17 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-1.

18 City of Palo Alto, *Palo Alto Comprehensive Plan EIR*, 1998.

Stormwater from the Hoover Pavilion Site is collected by Stanford University's storm drains, but the water then flows into a 33-inch main owned by the City, enters the City's storm drain system, and is released into San Francisquito Creek through a 42-inch outfall owned and operated by the City of Palo Alto.[19] As such, both the City's and Stanford University's storm drainage systems serve the Hoover Pavilion Site. The stormwater generated in the SUMC Sites is not treated prior to its release to San Francisquito Creek.

Solid Waste

The City previously contracted collection of garbage, recycling, and composting services to the Palo Alto Sanitation Company (PASCO).[20] PASCO is a private company, located in Palo Alto, whose current contract with the City expired in 2009. Currently, the City is contracted with GreenWaste Recovery Inc., for collection of garbage, recycling, and composting services in the City. GreenWaste Recovery, Inc., is a privately owned solid waste and recycling company that specializes in the collection and processing of residential and commercial trash, yard trimmings, curbside recyclables, food waste, and construction and demolition debris.[21]

In 2006, Palo Alto generated approximately 195,273 tons of solid waste, of which 120,432 tons (62 percent) were diverted from disposal through recycling, reduction, and reuse programs.[22] Table 3.15-5 presents a breakdown of the sources of solid waste. The City uses a one percent annual growth rate to project future waste generation.[23] At this rate, the City would generate 235,911 tons of solid waste in 2025.[24]

Table 3.15-5
Percentage of City of Palo Alto Solid Waste Generation by Source

Source	Percent of Solid Waste Generated by the City
Mixed Commercial and Multi-Family Residential	44%
Industrial	25%
Single-Family Residential	17%
Self Haul	14%

Source: *Palo Alto Waste Composition Study, Final Report,* Revised May 2006.

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19 City of Palo Alto, Storm Drain System Map, Sheets 16, 23, 24, 32, and 33, May 3, 2007.

20 Russell Reiserer, Solid Waste Manager, City of Palo Alto Solid Waste Manager, electronic communication with PBS&J, December 6, 2007.

21 GreenWaste Recovery Inc., Website, available at http://www.greenwaste.com/about-us-we-are-a-brighter-shade-green, accessed September 15, 2009.

22 Russell Reiserer, Solid Waste Manager, City of Palo Alto Solid Waste Manager, electronic communication with PBS&J, March 12, 2008.

23 The City uses a one percent growth rate, from year to year, to determine future waste generation volume, based on the State Department of Finance's population growth rate assumption of one percent per year for the City of Palo Alto.

24 Using the compounding formula of $P(1 + r)^t$, where $P = 195{,}273$ tons of solid waste generated by the City in 2006; $r = 0.01$; and t = time, in 2015 there would be $195{,}273\ (1 + 0.01)^9 = 213{,}567$ tons of solid waste generated and in 2025 there would be $195{,}273\ (1 + 0.01)^{19} = 235{,}911$ tons of solid waste generated.

Solid waste from the City is sent to multiple locations that each have their own monitoring schedules and data. As a result, it is not possible to directly compare the solid waste data. Consequently, this analysis uses historical trends to make comparisons. Historically, PASCO vehicles delivered 48,551 tons of solid waste (26 percent of total solid waste generated in the City of Palo Alto that year) to the Sunnyvale Material and Recovery Transfer (SMART) Station, located at 301 Carl Road in Sunnyvale, where it was sorted to remove recyclable goods.[25] Of the waste not sent to the SMART Station, approximately one-half was sent to Kirby Canyon Landfill, a third to the Palo Alto Refuse Disposal Landfill, and approximately ten percent to other disposal sites.[26] The SMART Station, which is owned and operated by the City of Sunnyvale, provides service to the cities of Mountain View, Sunnyvale, and Palo Alto. These three cities have a Memorandum of Understanding (MOU) to utilize the SMART facility that expires in 2021, at which time the cities would negotiate with the City of Sunnyvale to extend the terms of the MOU.[27] The SMART Station processes an average daily tonnage of 1,188 tons, or about 79 percent of its 1,500-ton permitted daily capacity.[28,29]

All non-recyclable solid waste from the SMART Station is compacted and consolidated in large transfer trailers prior to being trucked to the Kirby Canyon Landfill owned by Waste Management, Inc. (WM Inc.).[30] Recyclable waste is transported to other recycling facilities where it is processed. Historically, approximately 62 percent of the City's waste was diverted from landfills through recycling and solid waste programs.[31,32] The City has adopted new "Zero Waste" goals, which strive to divert 73 percent of waste from landfills by 2011 and to divert as much waste from landfills as possible by 2025.[33]

Palo Alto Refuse Disposal Landfill is expected to reach its total permitted capacity of 7.76 million cubic yards (2,095,200 tons) in late 2010. As of May 2009, approximately 150,000 cubic yards (40,500 tons) of refuse fill capacity remains (not including closure cap materials) which correlates into about a year or two operations until airspace depletion depending on the remaining fill rate.[34,35] Upon closure of the Palo Alto Refuse Disposal Landfill in 2010, it is expected that all non-recyclable solid waste currently delivered to Palo Alto's landfill would be diverted to various local disposal sites

25 These totals represent data from 2004.

26 City of Palo Alto, *Zero Waste Strategic Plan*, October, 2005.

27 Second Memorandum of Understanding Among the Cities of Mountain View, Palo Alto and Sunnyvale Relating to the Construction and Operation of a Materials Recovery and Transfer Station and The Long Term Disposal of Municipal Solid Waste at Kirby Canyon, September 30, 1991.

28 Debbi Sargent, Project Administer of the SMART Station, electronic communication with PBS&J, March 10, 2008.

29 These totals represent data from 2007.

30 Debi Sargent, Solid Waste Contract Administrator, City of Sunnyvale, Public Works, electronic communication with PBS&J, November 10, 2008.

31 Russell Reiserer, Solid Waste Manager, City of Palo Alto Solid Waste Manager, electronic communication with PBS&J, March 12, 2008.

32 These totals represent data from 2006.

33 Russell Reiserer, Solid Waste Manager, City of Palo Alto Utilities Department, electronic communication with PBS&J, November 21, 2007.

34 California Integrated Waste Management Board, http://www.ciwmb.ca.gov/Profiles/Facility/Landfill/LFProfile1.asp?COID=43&FACID=43-AM-0001, accessed December 19, 2007.

35 Numbers used represent data from 2005.

(including Kirby Canyon Landfill). The lease on the land for Kirby Canyon Landfill expires in 2034.[36] The Kirby Canyon Landfill is operating at less than 25 percent capacity.[37] There is approximately 21.6 million tons of remaining solid waste disposal capacity at the Kirby Canyon Landfill, of a total projected capacity of approximately 29 million tons.[38] Annualized solid waste tonnage received by Kirby Canyon Landfill is approximately 475,000 tons.[39] At that rate, the Kirby Canyon Landfill would reach capacity in approximately 45.5 years. Using WM Inc.'s planned closure date of 2034, and the remaining capacity of 21.6 million tons of solid waste, it would require an average annual tonnage rate of approximately 864,000 tons per year to reach the landfill capacity within the lease period.[40]

Energy

Electricity. The CPAU operates its own electric utilities. The City purchases electric power from hydroelectric resources, including those managed by the Western Area Power Administration (WAPA) and the Calaveras Hydroelectric Project, operated by the Northern California Power Agency (NCPA). Other renewable supplies and supplies from the market meet the customer demand. Electricity demand within Palo Alto fluctuates throughout the year, depending primarily on seasonal changes. In 2007, peak annual demand for Palo Alto was 185 megawatts (MW) and average daily energy consumption for the entire City was 2,784 megawatt hours (MWh).[41] Peak electrical demand is measured as the maximum MW demanded at any instant while daily and annual consumption rates are measured in MWh. The CPAU projections extend to the year 2017. The CPAU projects that the annual electricity demand for the City would be approximately 1.042 million MWh in 2017. Based on the CPAU's econometric model used to predict future consumption levels of electricity, the CPAU projects that demand is expected to remain relatively constant in the long term after 2017.[42,43] Additionally, the CPAU projects that the corresponding peak electrical load for the City would be 190 MW in 2017. This relatively constant load projection for the long term is based on growth currently anticipated and

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36 Kirby Canyon Landfill's lease consists of an initial 10-year term ending in 2014 and two 10-year extensions ending in 2034.
37 Guy Petraborg, Kirby Canyon Landfill, telephone communication, January 29, 2008.
38 Guy Petraborg, Kirby Canyon Landfill, electronic communication with PBS&J, November 19, 2008.
39 Totals represent data from 2005 to 2006.
40 Guy Petraborg, Kirby Canyon Landfill, electronic communication with PBS&J, November 19, 2008.
41 Shiva Swaminathan, Senior Resource Planner, Utilities Resource Management Division, City of Palo Alto, electronic communication with PBS&J, November 1, 2007.
42 Bernard Elrich, Resource Planner, Resource Management, City of Palo Alto, electronic communication with PBS&J, December 18, 2008.
43 The econometric models contain weather and seasonal variables as well as binary variables designed to capture the impact of specific holiday periods. The coefficients of these models are estimated over a period of 5 to 6 years. The past performances of each model are evaluated on a regular basis. Based on specific customer information exogenous variables are sometimes added to take into account the short to medium term expected changes in natural gas and energy consumption due to major new projects coming on or going off line during the 10 year forecast horizon. However, the November 2007 forecast did not include any information about the Stanford University Medical Center or the Stanford Shopping Center. As of November 2007, the econometric model designed to predict the energy purchased at City Gate had been a very accurate predictor of those purchases. Consequently, the model was not changed.

does not include potential load increases due to large development projects such as the SUMC Project.[44, 45]

Palo Alto purchases energy from companies that utilize a number of alternative power sources. During years with normal rainfall, 48 percent of power for the City is derived from hydroelectric power. Other power sources include 38 percent purchased from market sources, 13 percent wind power, and one percent power from landfill gas.[46] Palo Alto has adopted a 10-year energy efficiency plan; one of its goals is to meet up to 33 percent of its electricity needs by the year 2015 through renewable sources of power, such as wind, landfill gas, and solar.

The transmission system delivering electricity to the City consists of three 115-kilowatt (kW) transmission lines. High voltage lines are used for transmission to minimize electrical losses; however, high voltage lines are impractical for distribution lines. The interface between the transmission and distribution lines is made at the electrical substation, which features transformers that decrease the transmission voltage to lower voltages for the distribution systems. The distribution systems then transfer electricity to domestic and commercial consumers. Three transformers at the City's Colorado substation, with a total capacity of 454 MW, deliver energy to the local transmission system. However, the transmission lines from the City's substation are only capable of meeting a maximum system demand peak load of 385 MW. Therefore, the citywide peak capacity for Palo Alto is capable of meeting a system demand of approximately 385 MW.[47]

The City's local distribution feeders from the Quarry Road Substation currently serve the SUMC Sites. Quarry Road Substation transformers have a combined full-load rating of 54 MW. With additional cooling applied, the peak capacity at this station can reach 112 MW.[48,49] The additional cooling is achieved using currently installed fans that operate over the transformer cooling fins.[50]

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44 Shiva Swaminathan, Senior Resource Planner, Utilities Resource Management Division, City of Palo Alto, electronic communication with PBS&J, November 1, 2007.

45 A one percent growth rate in the demand for electricity was applied from 2017 to 2025: Using the compounding formula of $P(1 + r)^t$, where P = 1,042,085 MWh of electricity projected to be demanded by the City in 2017; r = 0.01; and t = time, in 2025 there would be $1,042,085(1+.01)^8$ = 1,128,429 MWh demanded by the City.

46 Market sources include: BP Energy Company, Coral Power L.L.C., and Sempra.

47 Jim Bujtor, Senior Power Engineer, Utilities Engineering Division, City of Palo Alto, electronic communication with PBS&J, June 4, 2008

48 Jim Bujtor, Senior Power Engineer, Utilities Engineering Division, City of Palo Alto, electronic communication with PBS&J, June 4, 2008.

49 The Quarry Substation full-load rating was converted from mega volt amperes (MVA) to megawatts (MW) by multiplying the MVA by 0.9. This was done to keep units of measurement consistent. Conversation factor was obtained from the CPAU.

50 Jim Bujtor, Senior Power Engineer, Utilities Engineering Division, City of Palo Alto, electronic communication with PBS&J, November 18, 2008.

Natural Gas. Palo Alto operates its own natural gas utilities and purchases natural gas at market-based costs from six suppliers. In 2006, the average gas demand per day for the City was 88,000 therms. The total gas consumed during that same year was approximately 32 million therms.[51] The CPAU's natural gas projections extend to the year 2016. The CPAU projects that the annual gas demand for the City will be approximately 32.6 million therms by 2016. Based on the CPAU's econometric model used to predict future consumption levels of natural gas, the CPAU projects that demand is expected to remain relatively constant in the long term after 2016.[52, 53] This relatively constant load projection for the long term is based on growth currently anticipated and does not include potential load increases due to large development projects such as the SUMC Project.[54]

Applicable Plans and Regulations

There are no applicable federal regulations pertaining to utilities. Applicable State and local regulations are identified and discussed below.

State Regulations

SB 610. Senate Bill (SB) 610, Section 21151.9 of the Public Resources Code (which is commonly referred to as the Urban Water Management Plan Code) became effective January 1, 2002. The bill coordinates local water supply and land use decisions to help ensure that California's cities and counties will have adequate water supplies. SB 610 requires that the applicable public water system, which in this case is the City of Palo Alto, prepare a Water Supply Assessment (WSA) for projects that are subject to CEQA and that meet specified statutory criteria. The WSA evaluates the available water supply for the proposed project, in combination with other existing and planned future uses. The WSA must include, among other information, an identification of existing water supply entitlements, water rights, and water service contracts relevant to the identified water supply for the proposed project.

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51 Shiva Swaminathan, Senior Resource Planner, Utilities Resource Management Division, City of Palo Alto, electronic communication with PBS&J, November 1, 2007.

52 Bernard Elrich, Resource Planner, Resource Management, City of Palo Alto, electronic communication with PBS&J, December 18, 2008.

53 The econometric models contain weather and seasonal variables as well as binary variables designed to capture the impact of specific holiday periods. The coefficients of these models are estimated over a period of 5 to 6 years. The past performance of each model is evaluated on a regular basis. Based on specific customer information, external variables are sometimes added to take into account the short to medium term expected changes in natural gas and energy consumption due to major new projects coming on or going off line during the 10 year forecast horizon. However, the November 2007 forecast did not include any information about the Stanford University Medical Center or the Stanford Shopping Center. As of November 2007, the econometric model designed to predict the energy purchased at the PG&E City Gate had been a very accurate predictor of those purchases. Consequently, the model was not changed. In November 2007, the existing natural gas forecast was revised because a growth of 1.1% in gas purchases had been observed during fiscal year 06-07. This forecast already included an external variable taking into account the expected impact of conservation programs. The forecast was also modified to account for an increase in natural gas consumption at Palo Alto's Compressed Natural Gas station.

54 Shiva Swaminathan, Senior Resource Planner, Utilities Resource Management Division, City of Palo Alto, electronic communication with PBS&J, November 1, 2007.

A WSA is required if a proposed project is subject to CEQA review in an EIR or negative declaration and is any of the following: (1) a residential development of more than 500 dwelling units; (2) a shopping center or business employing more than 1,000 persons or having more than 500,000 square feet (sf) of floor space; (3) a commercial office building employing more than 1,000 persons or having more than 250,000 square feet; (4) a hotel or motel with more than 500 rooms; (5) an industrial or manufacturing establishment housing more than 1,000 persons or having more than 650,000 sf or 40 acres; (6) a mixed use project containing any of the foregoing; or (7) any other project that would have a water demand at least equal to a 500 dwelling unit project.

A WSA addressing the SUMC Project has been prepared and approved by the Palo Alto City Council on March 16, 2010. The WSA concluded that the City has adequate water supply to meet the demand of the SUMC Project, assuming implementation of WSIP and EWSS projects and the WSCP. A copy of the WSA has been included as Appendix M for further reference.

SB 7. SB 7 was enacted by the California Legislature and signed into law by the Governor as part of the package of water legislation approved during the special legislative session of November 2009. The bill modifies the California Water Code (commencing with Section 10608) to require water agencies achieve a 20 percent reduction in urban per capita water use by 2020. The 20 percent reduction is relative to a baseline to be determined by each water agency using one of four methodologies described in the law. Water agencies have until July 1, 2011 to develop plans for achieving the required reductions. This timing corresponds with the deadline for water agencies to submit to the state their updated Urban Water Management Plans.

Palo Alto will develop plans for complying with SB 7 as part of its upcoming Urban Water Management Plan update process. The specific measures the City will undertake are uncertain at this time. Because Palo Alto has already achieved reductions in its per capita use over the past 10 years, it is likely the additional reduction required by SB 7 will be less than 20 percent. The City will determine the actual magnitude of its required reduction as part of its upcoming planning process. Any additional reductions in per capita water use achieved by the City will reduce its overall water demands.

AB 939. Title 7.3 of the Government Code (which is commonly referred to as the Integrated Waste Management Act) provides standards to minimize the amount of solid waste that must be disposed of by transformation and land disposal. The State Legislature passed Assembly Bill 939, the California Integrated Waste Management Act of 1989 (AB 939), effective January 1990. Under AB 939, all cities and counties in California were required to divert 25 percent of all solid waste from landfill or transformation facilities by January 1, 1995, and 50 percent by January 1, 2000.

Solid waste plans are prepared by each jurisdiction to explain how each city's AB 939 plan is integrated with its county plan. The plans must promote in order of priority: source reduction, recycling and composting, and finally, environmentally safe transformation and land disposal. In order to achieve the required waste diversion, Palo Alto has implemented a number of recycling and solid waste programs.

Title 24 Building Energy Efficiency Standards. Title 24, Part 6, of the California Code of Regulations (which is commonly referred to as the California Energy Code) includes standards mandating energy efficiency measures in new construction projects. Title 24, Part 6, regulates energy consumed for heating, cooling, ventilation, water, and lighting. It applies to non-institutional and non-residential buildings that are mechanically heated or cooled resulting in directly or indirectly conditioned space, and applies to all such development during all hours of operation, including hours when energy demand is at its peak within the region. The energy efficiency standards are enforced by the county and city building departments when a project applicant submits plans for a building permit.

The new medical office/clinic and research portions of the SUMC Project would be subject to Title 24, Part 6, energy standards; however, these standards would not apply to the hospital components of the SUMC Project, which are subject to distinct building code requirements under the jurisdiction of the Office of Statewide Health Planning and Development (OSHPD). Finally, it should be noted that the California Building Standards Commission and OSHPD have recently approved new energy and other conservation standards as part of the California Green Building Standards Code (Title 24, Part 11, of the California Code of Regulation), but at this juncture compliance with applicable standards is not mandatory.

Local Regulations

Zero Waste Strategic Plan. The City has adopted "Zero Waste" goals to divert 73 percent of waste from landfills by 2011 and to strive for "Zero Waste" by 2025, which essentially means diverting as much waste as possible from landfills.

The City's Zero Waste Strategic Plan is intended to guide City officials in the planning and decision making process to achieve Zero Waste goals. The objectives of this Zero Waste Strategic Plan are to identify opportunities to:

- Reduce volume and toxicity of wastes;
- Reuse materials and products;
- Expand recycling and composting services for all sectors and materials;
- Recover materials for their highest and best use; and
- Adopt policies and incentives to help achieve Zero Waste in Palo Alto.

There is currently no legal obligation for companies or organizations, including the SUMC Project, to comply with the City's Zero Waste Strategic Plan. The Strategic Plan is further discussed under Impact UT-4, later in this section.

Palo Alto Landscape Water Efficiency Standards. The City of Palo Alto has adopted by resolution water efficiency standards that apply to any new or renovated landscaping over 2,500 sf in size for commercial, industrial, institutional, multi-family common area, and City facility projects.[55] The standards require that a maximum water allowance (MWA) be calculated for a proposed landscape project prior to issuing a building or grading permit. The MWA was instituted in accordance with 1992 Assembly Bill 325, which was passed in response to a statewide need to conserve water as the population increases. The MWA may not exceed 80 percent of local reference evapotranspiration per year.[56] The formula for calculating MWA is:

square feet of landscaped area x 0.8 x 43.1 x 0.00083 = CCF/year;

where CCF is 100 cubic feet, the unit of measure on Palo Alto water meters and water bills. The SUMC Project would be subject to the City's Landscape Water Efficiency Standards.

Palo Alto Municipal Code, Requirement to Divert Construction and Demolition Waste from Landfill. Debris from construction and demolition activities in Palo Alto represents a significant volume of materials deposited in landfills.[57] Palo Alto Municipal Code, Chapter 5.24, contains a *Requirement to Divert Construction and Demolition Waste from Landfill Ordinance* requiring that a minimum of 90 percent of inert solids (e.g., concrete, asphalt, and rock) and a minimum of 50 percent of the remaining debris generated from construction and/or demolition projects be diverted from landfills through reuse and/or recycling. Unless a written waiver is obtained from the City, covered projects are required to plan, record, and demonstrate that waste prevention measures were practiced using reuse and/or recycling activities. Project applicants are required to submit a Debris Management Plan that estimates the total volume or weight of construction and demolition waste that will be generated and the means that the applicant proposes to use to divert the waste from landfills. Project applicants must also submit documentation demonstrating compliance with the diversion requirements, which may include receipts and weight tags or other records of measurement issued by the City-approved facility accepting the debris for reuse or recycling. Covered projects are defined as those requiring a demolition permit or building permit and whose project value is greater than or equal to $75,000. The SUMC Project would be required to comply with the City's *Requirement to Divert Construction and Demolition Waste from Landfill Ordinance*.

Impacts and Mitigation Measures

Methodology

This evaluation of the effects on utilities as a result of buildout of the SUMC Project is based on a qualitative assessment of the existing utilities, their service characteristics, and their service capacity, measured against the future demand that would be created by the SUMC Project. Baseline data was

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55 Palo Alto Utilities Department, website, available at http://www.city.palo-alto.ca.us/civica/filebank/blobdload.asp?BlobID=8771, accessed December 19, 2007.

56 Evapotranspiration is a measure of the amount of water evaporated from the soil surface and transpired by the leaves of a reference crop, in this case, turf. It is the amount of water required to maintain 4- to 6-inch tall turf grass in an open field in full sun. In Palo Alto it takes 43.1 inches of water per square foot per year to maintain a tall stand of turf.

57 City of Palo Alto, website, available at http://www.city.palo-alto.ca.us/environment/news/details.asp?NewsID=357&TargetID=63, accessed January 28, 2008.

derived using a variety of sources, including such documents as the City's *2005 Urban Water Management Plan*, Comprehensive Plan EIR, and Storm Drain System Maps. PBS&J communicated directly with the City's utility providers and internal departments (e.g. Public Works, Planning) where no previous and/or current documentation exists.

Standards of Significance

Based on significance thresholds determined by the City of Palo Alto, the SUMC Project would result in a significant utilities impact if it would:

- Exceed wastewater treatment requirements of the Regional Water Quality Control Board (RWQCB);
- Require or result in the construction of new stormwater or wastewater facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- Result in a determination by the wastewater treatment provider that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Need new or expanded entitlements for water supplies;
- Be served by a landfill with insufficient permitted capacity;
- Result in adverse physical impacts from new or expanded utility facilities required to provide service as a result of the project; or
- Result in a substantial physical deterioration of a utility facility due to increased use as a result of the project.

Environmental Analysis

UT-1. Water Demand. The SUMC Project would result in a less-than-significant water supply impact because it would not result in the need for new or expanded entitlements for water supplies, and would not require expansion or construction of water facilities. (LTS)

This analysis is based on the WSA for the SUMC Project (Appendix M).

The SUMC Project would generate increased water demand from the operation of the hospitals, medical clinics and offices, and research facilities. The existing SUMC Sites have a current water demand of approximately 362,000 gallons per day (gpd).[58] As a result of the SUMC Project, water demands on the SUMC Sites would increase by approximately 177,000 gpd, to a total of approximately 539,000 gpd.[59]

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[58] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-2.

[59] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-2.

The SUMC Project would result in a net increase in the City's total water demand of 0.18 mgd, or 1.4 percent, which would bring total demand in 2030 to 13.18 mgd. The SUMC Project's demand would not exceed Palo Alto's ISG of 17.07 mgd from the SFPUC.

During years of above-normal and normal water supply, the City has sufficient supplies to meet the demands of the SUMC Project. During single and multiple dry years, City water supplies from SFPUC are insufficient to meet demands. These supply deficiencies can be met with the implementation of the WSIP, EWSS projects, and dry year demand reductions in accordance with the WSCP.

The City plans to implement its WSCP in progressive stages as needed to achieve a positive balance of supplies and demands. Table 3.15-6 shows a comparison of citywide supply and demand, including implementation of the SUMC Project. For the conditions shown in Table 3.15-6, this results in demand reductions of up to 10 percent in a single dry-year and up to 20 percent in subsequent years of a multiple-dry-year event. These reduction levels correspond to implementation Stages I and II, respectively, of the City's WSCP. Given the broad range of conservation measures and the City's historical ability to achieve the targeted demand reductions through largely voluntary measures, it is not anticipated that Stage I or II reduction levels would have any secondary environmental impacts nor would implementation of such measures necessitate new or expanded entitlements for water supplies.

Supplies are sufficient to meet the demands of the SUMC Project at 2025 full buildout and operation. The SUMC Project would not require the City to create new or expanded entitlements for water supplies. Therefore, development of the SUMC Project in 2025 would have a less-than-significant impact on water supply.

The City's existing water transmission facilities have adequate capacity available to serve the increased demands of the SUMC Project. Consequently, the SUMC Project would not cause the existing water supply facilities to experience substantial physical deterioration that would cause the need for their replacement. Normal general maintenance and replacement of aged facilities would be expected as part of existing maintenance plans, and any substantial maintenance activities would be subject to environmental review. Therefore, the construction of the SUMC Project at full buildout would result in a less-than-significant impact related to the deterioration of water supply facilities.

IMPROVEMENT MEASURES. Although the SUMC Project would not need new or expanded entitlements for water supplies and would have a less-than-significant impact related to water demand, there are measures the City could encourage the SUMC Project sponsors to implement or consider imposing as conditions of approval. These measures would help reduce the actual water demands of the SUMC Project to below projected levels, and would thereby reduce the extent to which the City would need to implement its Water Shortage Contingency Plan during dry-year supply reductions from SFPUC.

Table 3.15-6
Supply Demand Comparison - SUMC

	Normal Year[a]		One Critical Dry Year[b]		Multiple Dry Year Event[b]					
					Year 1		Year 2		Year 3	
	mgd	%	mgd	%	mgd	%	mgd	%	mgd	%
2005										
SFPUC Projected Allocation	13.23	100%	12.02	90.9%	12.02	90.9%	10.44	78.9%	10.44	78.9%
Emergency Groundwater	0.00		0.00		0.00		0.00		0.00	
Palo Alto Normal Demand[c]	13.23		13.23		13.23		13.23		13.23	
Dry-Year Demand Reduction		0%		10%		10%		20%		20%
Palo Alto Reduced Demand	13.23		11.90		11.90		10.58		10.58	
Surplus/(Deficit)	***0.00***	***0%***	***0.13***	***1.0%***	***0.13***	***1.0%***	***-0.14***	***-1.1%***	***-0.14***	***-1.1%***
2025										
SFPUC Projected Allocation (with SUMC Project)	13.16	100%	12.17	92.5%	12.17	92.5%	10.61	80.6%	10.61	80.6%
Emergency Groundwater	0.00		0.00		0.00		0.45		0.45	
Palo Alto Normal Demand[c] (without Project)	12.98		12.98		12.98		12.98		12.98	
SUMC Demand[d]	0.18		0.18		0.18		0.18		0.18	
Dry-Year Demand Reduction		0%		10%		10%		20%		20%
Total Reduced Demand	13.16		11.84		11.84		10.53		10.53	
Surplus/(Deficit)	***0.00***	***0%***	***0.33***	***2.8%***	***0.33***	***2.8%***	***0.53***	***5.1%***	***0.53***	***5.1%***

Source: PBS&J, 2009, developed from City of Palo Alto Utilities *2005 Urban Water Management Plan* and SFPUC *2005 Urban Water Management Plan*.

Notes:

a. In a normal year, SFPUC is able to supply the maximum Supply Assurance (SA) for all retail and wholesale customers (this assumes the City of Hayward and others with the ability to grow beyond their SA will remain within their current SA through 2030). SA for Palo Alto is 17.07 mgd. However, SFPUC will not deliver more water than needed to meet demand. As a result, the projected SFPUC allocation does not exceed normal year demand.

b. Dry year reductions based on SFPUC *2005 Urban Water Management Plan*, Appendix C: Water Shortage Allocation Plans.

c. Palo Alto demand includes demand side management and 0.98 mgd system loss per City of Palo Alto Utilities *2005 Urban Water Management Plan*, p. 36. This does not reflect actual unaccounted for water.

d. Average annual demand. Based on SUMC Project demand at buildout. Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-2.

Stanford has indentified a long list of conservation measures that it proposes to implement to help reduce the water demands of the SUMC project. The City may impose these measures as conditions of approval. These improvement measures include the following:[60]

SHC and LPCH. The SHC and LPCH components of the SUMC Project should contain various water-saving features:

- The buildings should use automatic sensors on faucets and urinals throughout the hospitals and clinics buildings. These devices would ensure that people do not leave the water running when it is not necessary to do so.
- Low-flow fixtures should be used throughout the facilities. The SHC and LPCH components of the SUMC Project would seek to optimize the reduced water flow requirements with operational necessities for a hospital.
- Dual-flush and/or high-efficiency toilets should be used. These toilets use an average of 1.28 gallons per flush, as compared to 1.6 gallons per flush for new toilets as required by the Uniform Plumbing Code.
- The buildings should employ minimal use of water-cooled equipment such as ice-makers and when such equipment is used, it would be water-efficient.
- The buildings should not use once-through water-cooled equipment, such as sterilizers and imaging equipment that use potable water once and discharge it to the drain.
- Anti-microbial hand-rinse pumps and water efficient sterilizers with water recirculation and automatic shut-off should be used to reduce the need for handwashing.
- Where possible, the buildings should use EPA-labeled WaterSense fixtures. These devices use optimally low amounts of water, compared to conventional equipment.
- Minimizing the use of water for landscaping has been and should continue to be an overarching design principle of the SHC and LPCH components of the SUMC Project, and the hospitals would not increase water use for landscaping.
- The landscaping should be designed to make maximum use of drought-tolerant, native planting to minimize the water consumed in irrigation.
- In accordance with existing practice, landscape irrigation should be continually adjusted to match the season's progress. Watering would be reduced as the weather cools and would be turned off as soon as the rains begin.
- The hospitals' grounds team should use mulching lawn mowers that recycle grass clippings into the lawns. This would help the soil to retain moisture, which reduces the need for irrigation water.

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[60] Philips, William T., Memo from the Applicant to the City, *Water Supply Assessment for Stanford University Medical Center*, April 28, 2009.

- The grounds team also should make extensive use of bark mulch (generated by Stanford University tree pruning and provided to SUMC free of charge) to mulch the grounds, which would further help the soil to retain moisture and reduce the need for irrigation water.

SoM. With respect to the use of water, the SoM component of the SUMC Project should target water use reduction by 25 percent:

- The buildings should use automatic sensors on faucets and urinals.
- Low-flow fixtures should be used throughout the facilities.
- Dual-flush and/or high-efficiency toilets, or recycled water should be used for toilets and urinals.
- The buildings should employ minimal use of water-cooled equipment such as ice-makers and when such equipment is used, it would be water-efficient.
- The buildings should not use once-through water-cooled equipment, such as sterilizers, vacuum pumps and imaging equipment that use potable water once and discharge it to the drain.
- Anti-microbial hand-rinse pumps and water efficient sterilizers with water recirculation and automatic shut-off should be used to reduce the need for handwashing.
- Use of water for landscaping should be minimized.
- The landscaping should be designed to make maximum use of drought-tolerant, native planting to minimize the water consumed in irrigation.
- In accordance with existing practice, landscape irrigation should be continually adjusted to match the season's progress. Watering should be reduced as the weather cools and would be turned off as soon as the rains begin.
- The grounds team should use mulching lawn mowers that recycle grass clippings into the lawns.
- The grounds team also should make extensive use of bark mulch (generated by Stanford University tree pruning and provided to SUMC free of charge) to mulch the grounds, which further helps the soil to retain moisture and reduce the need for irrigation water.

UT-2. Wastewater Generation. The SUMC Project would result in a less-than-significant wastewater impact because it would not exceed treatment requirements of the RWQCB, would not significantly increase use of the wastewater disposal system, and would not require expansion or construction of wastewater collection or treatment facilities. (LTS)

Although the amount of wastewater generated by SUMC would increase, the type of uses and the controls for wastewater at SUMC would remain the same, so the wastewater constituents would not change from current conditions. All wastewater from the SUMC Project would flow to the RWQCP, where it would be treated prior to being discharged into San Francisco Bay. The RWQCP operates under National Pollutant Discharge Elimination System (NPDES) Permit CA0037834, which requires the RWQCP to conduct effluent monitoring and mandatory reporting requirements. The permitted amount of outflow wastewater for the RWQCP is an ADWF of 39 mgd, which is the amount of wastewater the RWQCP can process and release in a day while still meeting the RWQCB's wastewater treatment requirements. Therefore, because the RWQCP has adequate capacity to process the wastewater generated from the SUMC Project, the SUMC Project would not exceed the wastewater treatment requirements of the RWQCB.

The SUMC Project would generate increased wastewater from the operation of the hospitals, medical clinics and offices, and research facilities. The existing SUMC Sites currently generate 310,600 gpd of wastewater.[61] As a result of the SUMC Project, the SUMC Sites in 2025 are projected to generate 573,550 gpd of wastewater, resulting in a net increase of 262,950 gpd of wastewater.[62] In the 2006 to 2007 fiscal year, the CPAU estimated that the City produced an ADWF of 9.3 mgd of wastewater, which is approximately 71 percent of its allocated volume of 13.2 mgd.[63] With the SUMC Project, the total wastewater flow from the City of Palo Alto to the RWQCP would be 9.56 mgd.

The SUMC Project would not substantially increase the wastewater flow to the RWQCP. The RWQCP currently receives approximately 28 mgd of wastewater and operates at 28 percent below the plant's capacity of 39 mgd. In 2025, the RWQCP is projected to receive 30 mgd of wastewater and to operate at 23 percent below capacity. In 2025, the net increase in wastewater demand resulting from the SUMC Project (262,950 gpd) would be less than one percent of the total amount of wastewater received by the RWQCP in that year and less than 3 percent of the plant's remaining capacity of 9 mgd. Therefore, operation of the SUMC Project at 2025 full buildout would generate wastewater volumes that would be within RWQCP capacity and the SUMC Project would not require the City to implement wastewater infrastructure improvements.[64] Therefore, development of the SUMC Project in 2025 would have a less-than-significant impact on wastewater treatment plant infrastructure.

The City projects that wastewater for the SUMC Project would be routed through a 15-inch wastewater pipe beneath Welch Road, an 18-inch pipe beneath Quarry Road, and then a 24-inch pipe beneath Palo Road. The pipes beneath Welch Road and Quarry Road are just outside the Main SUMC Site, and the pipe beneath Palo Road is just outside the Hoover Pavilion Site. Stanford University implemented a wastewater flow monitoring program that confirmed the

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[61] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-1.

[62] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-1.

[63] James Allen, Senior Engineer, Palo Alto Regional Water Quality Control Plant, electronic communication with PBS&J, January 28, 2008.

[64] James Allen, Senior Engineer, Palo Alto Regional Water Quality Control Plant, electronic communication with PBS&J, January 3, 2008.

primary 24-inch wastewater main that serves the SUMC Sites has adequate capacity to serve the SUMC Project.[65] The City, in consultation with RMC Water and Environment, ran a hydraulic model, which concluded that the primary wastewater main serving the SUMC Sites would have adequate capacity to serve the SUMC Project. In addition, the SUMC Project sponsors would be responsible for working with the CPAU, as part of the routine development review process, to ensure that the existing wastewater collection and pipeline system serving the SUMC Sites could accommodate wastewater generated by the SUMC Project at full buildout. The wastewater mains serving the SUMC Sites run along Sand Hill Road, Welch Road, Arboretum Road, and Quarry Road. If any collection and pipeline system upgrades would be needed to serve the SUMC Project, the SUMC Project sponsors would be responsible for construction or providing funding for those system upgrades. Consequently, construction of the SUMC Project would not result in the need for additional wastewater treatment or conveyance facilities beyond those already identified for the SUMC Project. Therefore, the SUMC Project at full buildout would not require additional infrastructure, the construction of which could result in physical impacts.

As described in the analysis above, the SUMC Project would not require the expansion or installation of new wastewater facilities. Wastewater generated by the SUMC Project is within the capacity of the existing system; therefore, it is unlikely that the SUMC Project would contribute to any premature physical deterioration of the wastewater system. Consequently, the SUMC Project would not cause the existing wastewater facilities to experience substantial physical deterioration that would cause the need for their replacement. It should be noted that normal general maintenance and replacement of aged facilities would be expected as part of existing maintenance plans, and that any substantial maintenance activities would be subject to environmental review. Therefore, the construction of the SUMC Project would result in a less-than-significant impact related to the deterioration of wastewater facilities.

UT-3. Stormwater Generation. The SUMC Project would have a less-than-significant impact related to stormwater collection system capacity because it would not significantly increase use of the stormwater collection system, and would not require expansion or construction of new stormwater facilities. (LTS)

Stanford University's stormwater conveyance system serves the SUMC Sites. Stanford University's 90-inch diameter main that currently serves the SUMC Sites has adequate capacity to convey the 6-hour 10-year storm event without flooding.[66] The storm drains convey stormwater to the nearby San Francisquito Creek. As discussed in Section 3.11, Hydrology, under Impact HW-4, the SUMC Project would not substantially alter site topography, impervious surfaces, surface stormwater runoff, or the local storm drainage system. The SUMC Site surface is currently about 27 percent pervious land surfaces with about 3 percent of

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65 RMC Water and Environment, Technical Memorandum, City of Palo Alto Hydraulic Model Support- SUMC and SSC Development, October 30, 2008.

66 Catherine Palter, Associate Director, Land Use and Environmental Planning, Stanford University, electronic communication with PBS&J, March 13 2008.

green roofs. Implementation of the SUMC Project would ultimately create about 26 percent pervious land surfaces and about 11 percent of green roofs. Green roofs can detain 60 to 100 percent of precipitation, depending upon the substrate and size of storm event.[67] The increased amount of pervious surfaces (land surface plus green roof area; a 7 percent total increase in pervious surfaces) would reduce the amount of stormwater runoff from the SUMC Project compared to existing conditions. Per design guidelines for the SUMC Project, impervious surfaces and surface runoff would not be increased.[68] Accordingly, the SUMC Project would not increase flood-flow rates or alter flood flow conveyance capacity. Therefore, full buildout of the SUMC Project would not generate stormwater that would exceed flooding and stormwater conveyance capacity.

As described in the analysis above, the existing stormwater facilities serving the SUMC Project have adequate capacity to convey the 6-hour 10-year storm event without flooding. Also, the SUMC Project would increase pervious area and thereby decrease runoff. Therefore, the SUMC Project would not require the expansion or installation of new stormwater facilities and the existing stormwater facilities would not experience substantial physical deterioration that would cause the need for their replacement. Therefore, the construction of the SUMC Project at full buildout would result in a less-than-significant impact related to the deterioration of stormwater facilities.

UT-4. Solid Waste Generation. The SUMC Project would result in a less-than-significant solid waste impact because it would be served by landfills with sufficient capacity and, thus, would not contribute to the need to expand existing or construct new solid waste disposal facilities. (LTS)

The increases in employees and patient visits associated with development at the SUMC Sites would result in a net increase of solid waste generated, compared to existing conditions. Currently, the Main SUMC Site generates 4,730 tons of solid waste per year.[69] However, 1,030 tons, approximately 22 percent, of that solid waste is recycled. Therefore, the Main SUMC Site generates approximately 3,700 tons of non-recyclable solid waste each year. This is equal to approximately 4.14 pounds per gross square foot per year (lbs/gsf/year). The SUMC Project would result in approximately 1.3 million additional square feet on the SUMC Sites. However, approximately 446,000 square feet of the 1.3 million square feet would be for right-sizing, which would allow relocation of existing services into more appropriately sized (larger) areas (see Section 2, Project Description). Therefore, although the square footage would be increased, generation of additional solid waste would not be expected to occur as a result of the right-sizing because operations would not be expanded in these areas relative to existing operations. After adjusting for right-sizing, the SUMC Project would result in a net

67 N.D. VanWoert, D. B. Rowe, J. A. Andresen, C. L. Rugh, R. T. Fernandez, and L. Xiao. 2005. *Green Roof Stormwater Retention: Effects of Roof Surface, Slope, and Media Depth*. J. Environ. Qual. 34:1036–1044. Available at: http://jeq.scijournals.org/cgi/reprint/34/3/1036.pdf.

68 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 4,Tables 4-8(a) and 4-8(b).

69 Catherine Palter, Associate Director, Land Use and Environmental Planning, Stanford University, electronic communication with PBS&J, November 21, 2008.

increase of 865,441 square feet (see Table 2-7 in Section 2, Project Description). This square footage was calculated by subtracting the square footage needed for the SUMC to meet current requirement standards from the total net new square footage proposed for the SUMC Project. If the 4.14 lbs/gsf/year is applied to the net increase in square footage (adjusted for right-sizing), and, as expected, the recycling programs on the SUMC Sites continue to recycle a similar percentage of their total solid waste generated through 2025, the total increase in solid waste generated by the SUMC Project would equal approximately 1,625 tons per year. The net increase of 1,625 tons per year from the hospitals and medical offices would be approximately 0.8 percent of the existing 195,273 tons per year of solid waste generated by the City.[70] The City would generate 235,911 tons of solid waste in 2025.[71] The 1,625 tons per year of solid waste would be approximately 0.7 percent of the City's projected total solid waste generation in 2025.

The Kirby Canyon Landfill and SMART recycling center have sufficient capacity to accommodate the SUMC Project's increase in solid waste. From 2006 to 2007, the SMART Station on average had 21 percent of its permitted daily capacity remaining. The SMART Station received an average daily tonnage of 1,188 tons, or about 79 percent of its 1,500-ton permitted daily capacity from 2006 to 2007.[72] Conservatively assuming the net increase of solid waste generated at the SUMC Site is processed at the SMART Station, the SMART Station's daily tonnage would increase by 4.4 tons, for a total of approximately 1,192.4 tons. The SUMC Project would require approximately 1.4 percent of the SMART Station's remaining daily capacity of 312 tons per day.

Kirby Canyon Landfill currently contains 6.5 million cubic yards of solid waste. The Landfill is therefore operating at less than 25 percent capacity and has approximately 21 million cubic yards of remaining capacity.[73] As explained above, it is expected that the lease on the land for the landfill will be extended until at least 2034. Given the large amount of remaining capacity, Kirby Canyon Landfill would be able to accommodate the additional 1,625 tons per year (or 4.4. tons per day) of solid waste generation from the SUMC Project.

Since the SMART Station and Kirby Canyon landfill are projected to have available capacity, the SUMC Project would not require expansion of solid waste disposal facilities. In addition, the SUMC Project would include recycling activities that would reduce the amount of solid waste the SUMC Project would generate, which would further reduce the amount of solid waste sent to the landfill. Therefore, the SUMC Project would result in a less-than-significant solid waste impact.

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70 Assuming solid waste generation from 2006. Russell Reiserer, Solid Waste Manager, City of Palo Alto Solid Waste Manager, electronic communication with PBS&J, March 12, 2008.

71 Using the compounding formula of $P(1 + r)^t$, where P = 195,273 tons of solid waste generated by the City in 2006; r = 0.01; and t = time, in 2015 there would be $195{,}273\ (1 + 0.01)^9 = 213{,}567$ tons of solid waste generated and in 2025 there would be $195{,}273\ (1 + 0.01)^{19} = 235{,}911$ tons of solid waste generated.

72 The SMART Station is permitted to process solid waste on a tonnage per day basis, rather than a tonnage per year basis.

73 Guy Petraborg, Kirby Canyon Landfill, telephone communication, January 29, 2008.

The construction of the SUMC Project, throughout the construction period, would generate an undetermined amount of solid waste, including demolition debris. However, construction of the SUMC Project would be subject to the Requirement to Divert Construction and Demolition Waste from Landfill Ordinance (Palo Alto Municipal Code 5.24). This ordinance requires that a minimum of 90 percent of inert solids (e.g., concrete, asphalt, and rock) and a minimum of 50 percent of the remaining debris, generated from construction and demolition projects, be diverted from landfills through reuse and/or recycling.

Because the Kirby Canyon Landfill and the SMART Station have sufficient remaining capacity to serve the SUMC Project, it is not expected that the SUMC Project would cause the need for expansion or replacement of solid waste facilities. Therefore, the SUMC Project at full buildout would result in a less-than-significant impact related to insufficient landfill capacity or the need to construct or expand solid waste facilities.

In addition, the SUMC Project sponsors have identified the following recycling efforts that they currently are implemented or would implement as part of the SUMC Project.[74]

SHC and LPCH. The hospitals currently have programs in place to reduce the amount and toxicity of waste:

- The hospitals have made it a policy to come as close as possible to mercury free. In the process, the hospitals have eliminated a significant amount of waste.
- In 2001, the hospitals implemented a fluorescent lamp recycling program. In fiscal year 2007, 8.8 tons (17,643 pounds) were recycled as a result of the program.
- In 2001, the hospitals implemented a battery collection program. There are over 35 designated "Battery Recycling" collection locations throughout the medical center. In fiscal year 2007, 8.0 tons (15,938 pounds) of batteries were recycled.
- The hospitals began an E-waste recycling program in 2002. In fiscal year 2007, the hospitals recycled 7.3 tons through Zak Enterprises, one of the original 15 recyclers in the U.S. to endorse "The Recyclers Pledge of True Stewardship" as drafted by the Basel Action Network, an international organization focused on halting the export of toxic materials.
- The Surgical Pathology department has treated Formalin (a fixative) waste with NeutraLex® for over seven years. Instrumentation and automation upgrades use fewer chemicals and produce less chemical waste.
- All of the cardboard generated from the hospitals' primary supplier of medical supplies is recycled by the supplier.
- The hospitals return all toner and inkjet cartridges to the supplier for recycling.

74 Barbara Schussman, Memo from the SUMC to the City, dated December 5, 2008.

SoM. Campus-wide, Stanford University currently is engaged in numerous initiatives to reduce waste, including the following:

- Paper, cardboard, cans, glass, and plastics are all collected in recycling bins on the Stanford University campus. The SoM recycles paper, cans, glass, plastic, batteries, and printer cartridges.
- A lab glass recycling program recently has been started.
- Food waste is composted, which reduces waste and the use of water for garbage disposals.
- The University mulches brush and tree trimmings for use on campus, composts yard waste from residences and other buildings, and leaves mowing trimmings behind to replenish nutrients in lawn areas.
- Building materials, dirt, and other debris from construction and demolition are recycled and reused whenever possible.
- Compostable serviceware is provided at events.
- Electronic equipment is resold or recycled.
- Batteries are collected and recycled.
- Cell phones, PDAs, chargers, CDs, and other small electronics are collected from academic buildings and residences.
- Stanford has a "Surplus Chemical Program" exchange that gives researchers a direct means of improving the environment by reducing the volume of chemicals purchased and disposed of as waste.
- In 2007, Stanford recycled, reused, or composted:
  - 5,855 tons of organic material
  - 829 tons of glass, metal, and plastic
  - 3,095 tons of paper
  - 236 tons of electronic waste
  - 3,171 tons of construction and demolition debris

In addition, Section 3.6, Climate Change, lists measures that the SUMC Project sponsors are implementing to reduce waste through purchasing decisions, reuse of materials and equipment, use of building materials and products that generate less waste than comparable materials and products, and other programs designed to minimize waste. These programs are furthering the goals of the City's Zero Waste Strategic Plan. Based on the significance criteria previously identified in this section, the SUMC Project would have a less-than-significant impact related to solid waste generation.

UT-5. Energy Demand. Although the SUMC Project is an urban infill project and would not require the expansion of natural gas facilities and would use existing utility facilities, it may require the installation of near-site electrical facilities and natural gas pipelines to accommodate the projected additional demand. However, this installation is included in the SUMC Project and no additional off-site construction relating to electrical and natural gas facilities would occur. Therefore, the SUMC Project would have a less-than-significant impact related to the construction of energy facilities. (LTS)

Electricity. The SUMC Sites are already developed and connected to the CPAU's electrical and natural gas infrastructure. Although the SUMC Sites are already developed and connected to CPAU's electrical system, according to the City's Electric Engineering Manager, the SUMC Project may require additional electrical feeder cables to supply its increase in electricity demand.[75] As discussed in Section 2, Project Description, the SUMC Project would include installation of theses cables; these improvements are assumed as part of the SUMC Project and are analyzed throughout this EIR. The construction mitigation measures found throughout this EIR would apply to the installation of the feeder cables.

According to the SUMC application, it is estimated that the SUMC Project at full buildout would have a net increased peak demand of 9.04 MW, or a new total peak demand of 20.2 MW.[76] This net increase is less than five percent of the City's 2007 peak load demand of 185 MW and also less than five percent of the City's remaining peak load capacity of 200 MW.[77] Consequently, the SUMC Project would not require the construction of additional electrical facilities beyond those disclosed in the Section 2, Project Description. Therefore, the SUMC Project would have a less-than-significant impact related to the construction of new electric distribution facilities.

The SUMC Project would increase average daily consumption of electricity by 148.7 MWh, which is less than six percent of the City's daily electrical consumption of 2,784 MWh in 2007.[78, 79] Although the SUMC Project may require the installation of additional electrical feeder cables, the City's existing electrical facilities would not experience a substantial increase in usage due to the SUMC Project such that it would result in deterioration of facilities.[80] Thus, the existing electrical facilities serving the SUMC Site would not experience substantial physical deterioration that would cause the need for their replacement. Therefore, the

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75 Jim Bujtor, Utilities Engineering Division, City of Palo Alto, electronic communication with PBS&J, November 18, 2008.

76 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-1.

77 Jim Bujtor, Utilities Engineering Division, City of Palo Alto, electronic communication with PBS&J, June 4, 2008.

78 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6.

79 Shiva Swaminathan, Senior Resource Planner, Utilities Resource Management Division, City of Palo Alto, electronic communication with PBS&J, November 1, 2007.

80 Jim Bujtor, Utilities Engineering Division, City of Palo Alto, electronic communication with PBS&J, December 12, 2008.

construction of the SUMC Project at full buildout would result in a less-than-significant impact related to electrical facilities.

Natural Gas. The SUMC Project obtains natural gas from CPAU. The SUMC Project at full buildout is expected to have a net increase in peak natural gas demand of 12 therms.[81] Based on the capacity of the natural gas facilities serving the SUMC Project, this demand for natural gas is minor.[82] As a result, the CPAU has determined that the SUMC Project's demand would not necessitate the installation of new or expansion of its existing natural gas facilities.[83] However, it is possible that pipeline extensions would be needed near the SUMC Sites to serve the new buildings. These extensions would be within roadways and other developed areas. Therefore, the SUMC Project would have a less-than-significant impact on natural gas facilities.

For those portions of the SUMC Project subject to the California Energy Code (Title 24, Part 6, of the California Code of Regulations), construction would need to conform to the applicable energy conservation standards. Title 24, Part 6, regulates energy consumed for heating, cooling, ventilation, water, and lighting and applies to non-institutional and non-residential buildings that are mechanically heated or cooled resulting in directly or indirectly conditioned space, and it would apply to all such development during all hours of operation, including hours when energy demand is at its peak within the region. The new medical office/clinic and research facility portions of the SUMC Project would be subject to Title 24, Part 6. Title 24, Part 6, would not apply to the hospitals, which are subject to distinct building code requirements under the jurisdiction of OSHPD.

Because the SUMC Project would not result in a substantial change in the amount of natural gas usage in the City, the City's existing natural gas facilities would not experience a substantial increase in usage due to the SUMC Project such that it would result in deterioration of facilities that would cause the need for their expansion or replacement. Therefore, the construction of the SUMC Project at full buildout would result in a less-than-significant impact related to natural gas facilities.

Proposed Energy Conservation Measures. The SUMC Project sponsors have included the following measures to reduce energy consumption associated with SUMC Project operations beyond the levels otherwise required by Title 24 and OSHPD requirements. [84]

SHC and LPCH. As part of the proposed SUMC Project, the SHC and LPCH components of the SUMC Project would be designed to achieve EnergyStar scores of 90-95, which means they would perform better than 90-95 percent of similar hospitals. The buildings would use 35

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81 Stanford University, response to Data Request 4, February 20, 2008.

82 Greg Scoby, Senior Project Engineer, Utilities Department Water Gas Wastewater Engineering, communication with PBS&J, April 22, 2008.

83 Greg Scoby, Senior Project Engineer, Utilities Department Water Gas Wastewater Engineering, electronic communication with PBS&J, April 22, 2008.

84 Barbara Schussman, Memo from the SUMC to the City, dated December 5, 2008.

percent less energy than typical hospitals (based on a comparison to DOE's Commercial Buildings Energy Consumption Survey). Specific measures to achieve this level of conservation are set forth below.

Independent from the proposed SUMC Project, the hospitals' Engineering & Maintenance department is engaged in numerous conservation initiatives:

- The department has instituted a bulb-wattage improvement campaign, changing to electronic ballasts along with more energy efficient florescent bulbs, starting in all public areas. In FY 2007, the department purchased and installed over 8,000 T-8 bulbs, connected to over 500 new electronic ballasts. The department is also replacing burned out incandescent bulbs with compact florescent lights.
- Seven years ago, the department changed from light switches in all mechanical spaces to light timer switches. Four years ago, the department improved this practice by changing to digital switches with motion-detection devices.
- Ten years ago, the department began changing out air handler motors to Variable Frequency Drives (VFDs) during equipment replacement and upgrade efforts.
- The department is beginning to replace lighted exit signs with LED or phosphorescent exit signs.
- The department has enrolled in the City of Palo Alto's Compressed Air Management Program (CAMP) and will complete an analysis for potential further energy savings.

SoM. As part of the SUMC Project, the SoM component of the SUMC Project would meet Stanford University's 2008 Building Performance Guidelines, which set a target energy efficiency in new buildings of 30 percent below California Title 24.

- These buildings would feature a combination of state-of-the-art energy efficiency measures to achieve these goals, including exterior sunshades to reduce solar loads, highly insulated building shells and fenestration, building-level heat recovery, high efficiency building lighting systems, high efficiency HVAC equipment, use of passive cooling, and smart building technology to coordinate building systems operation with occupancy and use patterns. These buildings would be provided with full energy metering and energy use would be closely monitored after commissioning to assure that building systems are operating as intended and that energy goals are being met.

Given the above points, the SUMC Project would have less-than-significant impacts related to energy consumption.

Cumulative Analysis

The geographic context for a discussion of cumulative impacts to utilities is the service area of the utility in question. For instance for cumulative impacts, the following are geographic contexts for various utilities:

- Water supply: the CPAU service area (City of Palo Alto);
- Wastewater: the RWQCP's service area (cities of Mountain View, East Palo Alto, Los Altos, and Los Altos Hills, and Stanford University);
- Storm drainage system: the City of Palo Alto and the Stanford University campus;
- Solid waste: the Kirby Canyon Landfill service area (San Francisco Bay Area) and the SMART Station service area (cities of Mountain View, Sunnyvale, and Palo Alto); and
- Electricity/natural gas consumption: the CPAU service area (City of Palo Alto).

The cumulative impacts analysis for each utility includes all cumulative growth within its respective service area by 2025 or, if projections for 2025 are not available, the closest projections to 2025. The anticipated cumulative growth for Palo Alto is based upon projected future demands prepared by the respective service providers, as presented under Existing Conditions.

UT-6. Cumulative Water Impacts. Since the City has sufficient water supply to accommodate water demands for cumulative development up to 2025, new or expanded entitlements for water supplies are not necessary. Therefore, cumulative development would have a less-than-significant cumulative impact related to water supply. (LTS)

As discussed in the Existing Conditions section, City demand projections include growth beyond current demands, but do not specifically include the increased demand from the SUMC Project.

In 2025, the City is projected to request 12.98 mgd of water from SFPUC. In 2025, the net increase in water demand resulting from the SUMC Project would be 1.4 percent of the total demand supplied to the City in that year. The SUMC Project's demand would not exceed Palo Alto's Supply Assurance of 17.07 mgd from the SFPUC.

During above-normal and normal years, the City has sufficient water supplies to meet the demands of the City under projected 2025 conditions. During single- and multiple-dry-years, City water supplies from SFPUC are insufficient to meet these demands. However, these supply deficiencies would be met with the implementation of the WSIP, EWSS projects, and dry year demand reductions in accordance with the WSCP. Under existing and projected future conditions, and with implementation of the SUMC Project, the City projects that it would need to implement Stage I reductions during a single dry-year shortage event, and Stage II reductions during subsequent years of a multiple-dry-year shortage event. These are the same Contingency Plan implementation stages the City would need to implement without the SUMC Project in place.

The City, therefore, would have sufficient water available to serve the SUMC Project in addition to its existing and planned customers through its current water management planning horizon of 2030 in average year, dry-year, and multiple-dry-year conditions.

The City is projected to have adequate water supply to serve demands in the City through 2025, assuming WSIP and EWSS projects are completed as proposed in their respective EIR documents. Therefore, the City would not need new or expanded entitlements for water supplies and the cumulative impact would be less than significant.

UT-7. Cumulative Wastewater Impacts. Since the RWQCP has sufficient capacity to accommodate wastewater generated by cumulative development up to 2025, implementation of major facility and infrastructure improvements would not be necessary. In addition, general replacement and maintenance of old wastewater facilities is expected and would comply with applicable environmental regulations. Therefore, cumulative development would not have a significant cumulative impact related to wastewater. (LTS)

CPAU published an Urban Water Management Plan (UWMP) in December 2005, which projected that in 2025, the RWQCP would collect and treat approximately 30 mgd ADWF of wastewater, or 77 percent of its ADWF capacity of 39 mgd. This indicates that in 2025, the RWQCP would have sufficient capacity to accommodate cumulative development within its service area. Adding the wastewater from the SUMC Project, the RWQCP would receive 30.3 mgd, which is well below its 39 mgd capacity.

As discussed above, the RWQCP is projected to have adequate capacity to process the wastewater generated from the City through 2025. Therefore, the RWQCP would not exceed its NPDES permitted outflow of 39 mgd of wastewater and would not exceed the wastewater treatment requirements of the RWQCB.

Future development in the City of Palo could generate an increased amount of wastewater, and this increase could require the maintenance and replacement of outdated and deteriorated wastewater facilities. Any such replacements or maintenance would comply with all applicable environmental regulations. The City has a Capital Improvement Program that provides replacements and maintenance for the City's utility facilities. This program is funded by the rates charged to customers for utility services. Ongoing maintenance of wastewater facilities would ensure that any potential for cumulative impacts would be less than significant.

UT-8. Cumulative Stormwater Generation. Cumulative development in the City of Palo Alto and at Stanford University could increase the amount of stormwater runoff. This increased level of runoff may trigger the need for the replacement or maintenance of storm drain facilities. However, general replacement and maintenance of storm drain facilities is included in City plans and would comply with applicable environmental regulations. Therefore, cumulative development would have a less-than-significant cumulative impact related to the capacity or deterioration of storm drain facilities. (LTS)

Stormwater impacts from development are usually limited to the drainage basin surrounding the SUMC Sites. Continued growth and development within the San Francisquito Creek Watershed could increase the amount of impervious areas. However, as discussed in Section 3.11, Hydrology, most of the foreseeable projects within the cities of Menlo Park and

Palo Alto are primarily infill and re-development and would not substantially alter the amount of impervious surfaces within the watershed. As discussed under Impact HW-12, in Section 3.11, Hydrology, if the amount of impervious surfaces is increased, stormwater runoff controls would be required to ensure that runoff does not exceed existing rates for less than two-year through 10-year storm event for areas subject to Hydrologic Master Plan (HMP) controls. Other areas are already mostly impervious surfaces and redevelopment would not substantially alter the amount of impervious surface cover and hence, stormwater runoff. Furthermore, increased impervious surfaces in urban areas often have little effect on flows during extreme events (e.g., 100-year flood flow events) because during these events, rainfall saturates even natural soils, rendering them effectively impervious. Therefore, cumulative development would have a less-than-significant cumulative impact related to the capacity of storm drain facilities.

As the storm drainage system ages, the City may need to perform maintenance on deteriorated or outdated storm drain facilities. Future development in the City of Palo Alto could generate a limited increase in the amount of impervious surface, which could contribute to the deterioration of facilities. Any such maintenance would comply with all applicable environmental regulations. The City has a Capital Improvement Program to maintain the City's utility facilities, which is funded by the rates charged to customers for utility services. Thus, ongoing maintenance of storm drain facilities would ensure that cumulative development in the City would not have a significant cumulative impact related to storm drain facilities.

UT-9. Cumulative Solid Waste Impacts. Cumulative development would generate solid waste within the permitted capacity of the SMART Station and Kirby Canyon Landfill. Cumulative development would not result in substantial deterioration of solid waste facilities. As such, cumulative impacts related to solid waste generation would be less than significant. (LTS)

Construction of New or Expanded Solid Waste Facilities due to Insufficient Capacity. The SMART Station serves the cities of Mountain View, Sunnyvale, and Palo Alto. From 2006 to 2007, the SMART Station processed an average daily tonnage of 1,188 tons, or at about 79 percent of its 1,500-ton permitted daily capacity.[85] In 2006, the City of Palo Alto generated 195,273 tons (or 535 tons per day) of solid waste.[86] In 2006, the City of Palo Alto diverted 48,413 tons (or 133 tons per day) of its solid waste to the SMART Station; approximately 25 percent of its total solid waste generated in 2006.[87] The City uses a one percent annual growth rate to project future waste generation.[88] At this rate, the City of Palo Alto is projected to

85 Debbi Sargent, Project Administer of the SMART Station, electronic communication with PBS&J, March 10, 2008.
86 Russell Reiserer, Solid Waste Manager, City of Palo Alto Solid Waste Manager, electronic communication with PBS&J, March 12, 2008.
87 SMART Station Cooperative Venture, *Smart Partnerships* (brochure), available online at: http://www.rightangle.com/pdfs/smart_brochure.pdf, accessed on: March 27, 2010.
88 The City uses a one percent growth rate, from year to year, to determine future waste generation volume, based on the State Department of Finance's population growth rate assumption of one percent per year for the City of Palo Alto.

generate 235,911 tons (or 646 tons per day) of solid waste in 2025.[89] At its current rate, the City of Palo Alto would divert approximately 162 tons of solid waste per day to the SMART Station in 2025, an increase of approximately 29 tons of solid waste per day when compared to what was diverted in 2006.

In 2006, the City of Mountain View generated 212,857 tons (or 583 tons per day) of solid waste.[90] In 2006, the City of Mountain View diverted 84,550 tons (or 232 tons per day) of its solid waste to the SMART Station; approximately 40 percent of its total solid waste generated in 2006.[91] Mountain View does not have solid waste projections through 2025.[92] Assuming the same solid waste generation growth rate as Palo Alto, the City of Mountain View is projected to generate 257,154 tons (or 705 tons per day) of solid waste in 2025.[93] At its current rate, the City of Mountain View would divert approximately 282 tons of solid waste per day to the SMART Station in 2025, an increase of approximately 50 tons of solid waste per day when compared to what was diverted in 2006.

In 2006, the City of Sunnyvale generated 261,452 tons (or 716 tons per day) of solid waste.[94] In 2006, the City of Sunnyvale diverted 130,633 tons (or 358 tons per day) of its solid waste to the SMART Station; approximately 50 percent of its total solid waste generated in 2006.[95] Sunnyvale does not have solid waste projections through 2025.[96] Assuming the same solid waste generation growth rate as Palo Alto, the City of Sunnyvale is projected to generate 315,863 tons (or 865 tons per day) of solid waste in 2025.[97] At its current rate, the City of Sunnyvale would divert approximately 433 tons of solid waste per day to the SMART Station in 2025, an increase of approximately 75 tons of solid waste per day when compared to what was diverted in 2006.

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89 Using the compounding formula of $P(1 + r)^t$, where P = 195,273 tons of solid waste generated by the City in 2006; r = 0.01; and t = time, in 2025 there would be $195{,}273(1 + 0.01)^{19} = 235{,}911$ tons of solid waste generated.

90 California Integrated Waste Management Board, website: http://www.calrecycle.ca.gov/LGCentral/Tools/mars/JurDrDtl.asp?Flag=1&Ju=328&Yr=2006, accessed on March 29, 2010.

91 SMART Station Cooperative Venture, *Smart Partnerships* (brochure), available online at: http://www.rightangle.com/pdfs/smart_brochure.pdf, accessed on: March 27, 2010.

92 Lori Topley, Solid Waste Program Manager, City of Mountain View, telephone communications, March 30, 2010.

93 As the City of Mountain View does not have current or accurate solid waste projections through 2025, the City of Palo Alto's methodology for projecting future solid waste generation has been applied to the City of Mountain View. Please note that the baseline (P) for solid waste generation in the City of Mountain View has been derived from the California Integrated Waste Management Board.

94 California Integrated Waste Management Board, website: http://www.calrecycle.ca.gov/LGCentral/Tools/mars/JurDrDtl.asp?Flag=1&Ju=519&Yr=2006, accessed on March 29, 2010.

95 SMART Station Cooperative Venture, *Smart Partnerships* (brochure), available online at: http://www.rightangle.com/pdfs/smart_brochure.pdf, accessed on: March 27, 2010.

96 Mark Bowers, Solid Waste Program Manager, City of Sunnyvale, telephone communication, March 29, 2010.

97 As the City of Sunnyvale does not have current or accurate solid waste projections through 2025, the City of Palo Alto's methodology for projecting future solid waste generation has been applied to the City of Sunnyvale. Please note that the baseline (P) for solid waste generation in the City of Sunnyvale has been derived from the California Integrated Waste Management Board.

In 2025, the cities of Mountain View, Sunnyvale, and Palo Alto would divert, on average, an additional 154 tons of solid waste per day to the SMART Station when compared to the average daily tonnage of received at the SMART Station from 2006 to 2007 (1,188 tons of solid waste per day). This would bring the average daily tonnage received at the SMART Station in 2025 to 1,342 tons of solid waste per day, or approximately 89 percent of its 1,500-ton permitted daily capacity. Cumulative development through 2025 within the SMART Station service area would not necessitate construction or expansion of solid waste transfer facilities, and cumulative impacts would be less than significant.

As discussed under Existing Conditions, the lease on the land for Kirby Canyon Landfill expires in 2034.[98] The Kirby Canyon Landfill currently contains 6.5 million cubic yards of solid waste. The Landfill is therefore operating at less than 25 percent capacity and has approximately 21 million cubic yards of remaining capacity.[99] In tonnage, there is approximately 21.6 million tons of remaining solid waste disposal capacity at the Kirby Canyon Landfill, of a total projected capacity of approximately 29 million tons.[100] Annualized solid waste tonnage received by Kirby Canyon Landfill is approximately 475,000 tons.[101] At that rate, the Kirby Canyon Landfill would reach capacity in approximately 45.5 years, well beyond the 2025 cumulative horizon for the SUMC Project. Additionally, various jurisdictions in the Bay Area are implementing policies to reduce solid waste. For example, Palo Alto has adopted “Zero Waste” goals, which strive to divert 73 percent of waste from landfills by 2011 and produce as little land filled solid waste as possible by 2025. Goals such as these would decrease the amount of solid waste flow into Kirby Canyon Landfill, compared to current rates. As such, cumulative development through 2025 within the Kirby Canyon Landfill service area would not necessitate construction or expansion of solid waste facilities, and cumulative impacts would be less than significant.

Deterioration of Solid Waste Facilities. The local enforcement agency (LEA), designated by the City of San Jose Code Enforcement, regulates Kirby Canyon Landfill and is responsible to inspect and enforce:

- State minimum standards for disposal sites, transfer stations, compost operations and facilities, construction and demolition operations and facilities, and other operations and facilities outlined in 14 California Code of Regulations (CCR), Chapters 3 and 3.1, applicable sections of 27 CCR Chapter 3;
- Solid waste facility permit terms and conditions; and
- The administration of Solid Waste Facilities Permits and Closure/Postclosure Maintenance Plans.

98 Kirby Canyon Landfill’s lease consists of an initial 10-year term ending in 2014 and two 10-year extensions ending in 2034.
99 Guy Petraborg, Kirby Canyon Landfill, telephone communication, January 29, 2008.
100 Guy Petraborg, Kirby Canyon Landfill, electronic communication with PBS&J, November 19, 2008.
101 Totals represent data from 2005 to 2006.

Therefore, the Kirby Canyon Landfill would be properly inspected and monitored preventing the substantial physical deterioration of its facilities.

Regarding potential deterioration of the SMART Station, the City of Sunnyvale contracts a maintenance company that would prevent deterioration of this facility throughout its operation. If operation of this facility would continue to 2025 and beyond, maintenance service is expected to continue and impacts would be less than significant.

UT-10. Cumulative Energy Demand. Cumulative development in the City of Palo Alto would consume additional energy and, therefore, would increase the demand for energy. The City's electrical and natural gas facilities are projected to have adequate capacity to serve the City's increased demand for energy. The increased level of energy demand may trigger the need for the replacement or maintenance of energy facilities. However, general replacement and maintenance of energy facilities is expected and would comply with applicable environmental regulations. Therefore, cumulative development would not have a significant cumulative impact related to energy demand and energy facilities. (LTS)

Energy consumption of most individual projects within the City would be subject to the California Energy Code (Title 24, Part 6), as described earlier under Applicable Plans and Regulations." Compliance with Title 24, Part 6, would reduce the amount of energy consumed by future development and would help prevent any wasteful use of energy. As discussed under Existing Conditions, the peak electrical load for the City is projected to be 190 MW in 2017 and is expected to stay relatively constant after 2017; the City would still have approximately 195 MW remaining of its peak capacity of 385 MW. Therefore, cumulative development within the City would not require new facilities, which could result in an environmental impact.

As discussed under Existing Conditions, the CPAU projects that the annual gas demand for the City will be approximately 32.6 million therms by 2016; CPAU also projects that the demand would remain relatively constant in the long term after 2016. According to the CPAU, site specific loads could require upsizing of distribution components; however, overall deliverability of the City's natural gas distribution system would have capacity for cumulative development in 2025, based on growth currently anticipated.

As discussed above, future development in the City of Palo Alto would increase energy demand, and this increase could require the maintenance and replacement of deteriorated energy facilities. Any such replacements or maintenance would comply with all applicable environmental regulations. The City has a Capital Improvement Program that provides replacements and maintenance for the City's utility facilities. This program is funded by the rates charged to customers for utility services. Ongoing maintenance of energy facilities would ensure that any potential for cumulative impacts would be less than significant.

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Chapter 4
Other CEQA Considerations

4.1 SIGNIFICANT UNAVOIDABLE ENVIRONMENTAL IMPACTS

Section 21100(b)(2)(A) of the California Environmental Quality Act (CEQA) requires that an Environmental Impact Report (EIR) identify any significant environmental effects that cannot be avoided if the Stanford University Medical Center Facilities Renewal and Replacement Project (SUMC Project) is implemented. Most impacts identified for the SUMC Project would either be less than significant or could be mitigated to a less-than-significant level. However, the SUMC Project would result in some significant impacts that cannot be mitigated to less-than-significant levels. The SUMC Project would have significant and unavoidable project and cumulative impacts related to:

- Deterioration of intersection level of service during Peak Hour conditions at three Menlo Park intersections (Middlefield Road and Willow Road, Bayfront Expressway and Willow Road, and University Avenue and Bayfront Expressway);
- Increased average daily traffic on four Menlo Park roadway segments, on Marsh Road, Sand Hill Road, Willow Road, and Alpine Road;
- Emission of criteria air pollutants (NOx) during construction, on both a project level and cumulative level;
- Emission of criteria air pollutants (ROG, NOx, PM_{10}) during operation, on both a project level and cumulative level;
- Contribution to cumulative emissions of toxic air contaminants;
- Emission of greenhouse gases, which would contravene the City's ability to meet emission reduction goals in the Palo Alto Climate Protection Plan and which would have a cumulatively considerable contribution to global climate change;
- Temporary but substantial noise during construction, on both a project level and cumulative level;
- Emission of ambulance noise along a new route along Sand Hill Road into the proposed Durand Way extension, so that noise levels at roadside residences would increase by a level considered unacceptable under the City's Comprehensive Plan;
- Demolition of an historical structure, the 1959 Hospital Building complex (also referred to as the Stone Building complex), which is a significant and unavoidable impact on both a project and cumulative level; and
- Removal of up to 71 Protected Trees, as defined in City of Palo Alto's Tree Protection and Management Regulations, which is a significant and unavoidable impact on both a project level and a cumulative level.

Due to these significant unavoidable environmental effects, approval of each the SUMC Project would require the adoption of a Statement of Overriding Considerations, indicating that the City of Palo Alto is aware of the significant environmental consequences and believes that the benefits of approving the SUMC Project outweigh its unavoidable significant environmental impacts.

4.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL CHANGES

Section 21100(b)(2)(B) of CEQA requires that an EIR identify any significant effect on the environment that would be irreversible if the SUMC Project were implemented. Section 15126.2(c) of the CEQA Guidelines identifies irreversible environmental changes as those involving a large commitment of nonrenewable resources or irreversible damage resulting from environmental accidents.

The SUMC Project would result in an increase of approximately 1.3 million square feet of new hospital and medical office/clinic space within the SUMC Sites, comprised of the Main SUMC Site and the Hoover Pavilion Site (see Table 2-5 in Section 2, Project Description). Total floor space within the SUMC Sites would increase from roughly 2.4 million square feet to roughly 3.7 million square feet at buildout of the SUMC Project. During construction, the SUMC Project would involve a commitment of nonrenewable resources, including building materials and fossil fuels. Also, due to the large increase in floor space at the SUMC Sites, it can be reasonably foreseen that post-construction commitment of nonrenewable resources would increase from current levels, although the amount and rate of consumption of these resources would not result in the unnecessary, inefficient, or wasteful use of resources. It is also possible that new technologies or systems would emerge, or would become more cost-effective, to further reduce the reliance upon nonrenewable natural resources. Sustainable measures that are included in the design of the SUMC Project are listed under Subsection 2.5, Changes Proposed Under the SUMC Project, in Section 2, Project Description.

Accidents, such as the release of hazardous materials, may trigger irreversible environmental damage. The 1.3-million-square-foot increase of floor space used for medical purposes would result in increased use, handling, storage, and generation of hazardous and medical wastes as described in Section 3.12, Hazardous Materials. As shown in Table 3.12-6 of Section 3.12, Hazardous Materials, the post-construction amounts of hazardous materials at the SUMC Sites would exceed the existing amounts of chemicals and hazardous materials currently on site. However, the difference in volumes is minimal and, as explained in Section 3.12, would therefore not pose a significant impact. The SUMC Project sponsors would be required to comply with applicable requirements pertaining to the use and storage of these substances.

The Hoover Pavilion Site contains contaminated soils, which could be disturbed during construction. As such, the risk associated with hazardous materials and waste from construction of the SUMC Project would increase compared with existing conditions posing a potentially significant impact. However, Mitigation Measure HM-3.1 through HM-3.4, as described in Section 3.12, would be required and would reduce the impacts to less than significant. Additionally, safety requirements and the goals and policies adopted in by federal, State, and local governments, as well as the current SUMC policies and regulations regarding handling of hazardous materials, would reduce the public health and safety risks to less-than-significant levels, so that significant irreversible changes from accidental releases would not be anticipated. Mitigation measures and the federal, State, and local government's regulations are identified in Section 3.12, Hazardous Materials.

4.3 GROWTH-INDUCING IMPACTS

Section 15126.2(d) of the CEQA Guidelines states that an EIR should discuss "…the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment." Growth can be induced in a number of ways, including through the elimination of obstacles to growth, through the stimulation of economic activity within the region, or through precedent-setting action. CEQA requires a discussion of how a project could foster population, employment, or housing growth in the areas surrounding the project, as well as an analysis of how any such induced growth could tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. This section of the EIR discusses the manner in which the SUMC Project could affect growth in the City of Palo Alto, and the larger Bay Area.

In accordance with the CEQA Guidelines, Section 15126.2, this discussion of growth inducement is not intended to characterize growth induced by the SUMC Project as necessarily beneficial, detrimental, or of little significance to the environment. The growth inducement discussion is provided for informational purposes so that the public and local decision-makers have an appreciation of the potential long-term growth implications of the SUMC Project.

In discussing growth inducement, it is useful to distinguish between direct and indirect growth. Direct population and housing growth occurs on a project site as a result of new facilities (buildings) being constructed, or an increase in developed space. Indirect employment growth occurs beyond a project site but is stimulated by the project's direct growth. Indirect growth is tied to increased direct and indirect investment and spending associated with the new direct growth. Further, a project may indirectly induce construction of housing in the surrounding community if existing and planned regional housing supplies are not sufficient to accommodate direct growth in employment associated with the project. When CEQA refers to induced growth, CEQA means all growth—direct, indirect, or otherwise defined. For clarity, the discussion below distinguishes between direct growth from the construction and use of project facilities, and all secondary growth, or indirect growth.

Direct and Indirect Housing Growth. Section 3.13, Population and Housing, states that the SUMC Project would not directly increase population by adding homes or displace housing or residents. However, it would indirectly induce growth by providing additional jobs.

As discussed in Section 3.13, Population and Housing, the SUMC Project would increase on-site employment (adjusted for part-time employment) by 2,242 in 2025. The increased employment could indirectly result in the need for additional housing in the City and other jurisdictions within commuting distance. As discussed in the Housing Needs Analysis for the SUMC Project (see Appendix K), a regional demand for 1,303 new housing units could result from the SUMC Project employment. As discussed in Section 3.13, the secondary housing growth associated with the SUMC Project would be 0.28 percent of the projected household growth in the Bay Area region, 0.5 percent of household growth in Santa Clara County, 0.9 percent of household growth in San Mateo County, and 1.7 percent of the projected household growth within the City of Palo Alto. Therefore, the SUMC Project would not significantly impact the 2025 forecasted household growth within the City and other jurisdictions within the region, and the demand for housing as a result of the SUMC Project would be less than significant.

Direct and Indirect Job Growth. Direct job increases are expected as a result of the SUMC Project, as described above. The SUMC Project would also result in indirect job growth. The direct spending associated with construction activities would stimulate production of associated products and services in the economy during construction. This indirect job growth would not be substantial in terms of the local or Bay Area economy, due to its temporary nature.

Construction of the SUMC Project would directly, but temporarily, increase construction employment. As described in Section 3.4 Transportation, the maximum number of on-site construction workers at one time would be up to 2,200 for all SUMC Project Sites combined. Given the limited duration and standard nature of the construction anticipated, the demand for construction employment would likely be met within the existing and future labor market in the City of Palo Alto, in Santa Clara County, or within the Bay Area. Neither a substantial quantity of specialized labor nor construction workers from outside the region would be expected to be induced to relocate temporarily or to commute extraordinarily long distances.

Indirect growth could also be generated through the expenditure patterns of employees associated with the SUMC Project. For example, future workers would spend money in the local economy, and the expenditure of that money would result in additional jobs.

To estimate this potential "multiplier effect" associated with SUMC related jobs, ABAG has developed local (Type I) and regional (Type II) economic multipliers for the San Francisco Bay Region based on an input-output model.[1] The economic multipliers measure the direct, indirect, and induced employment caused by a project. The jobs that would be generated by the SUMC Project would be classified as Health Services from ABAG's list of industries with a Type I multiplier of 1.24 and a Type II multiplier of 1.60. This means that for every medical job created, there would be 0.24 indirect and induced jobs created locally and 0.60 jobs created regionally. Applying the local and regional economic multipliers to the 2,242 new jobs directly resulting from the SUMC Project, the SUMC Project would result in about 538 local and 1,345 regional indirect and induced jobs. Therefore, the combined total local employment growth (direct and indirect employment) with the SUMC Project would be about 2,780 new jobs, and the combined regional employment growth would be about 4,125 new jobs. This increase in regional employment represents 0.09 percent of the projected 4,788,330 total jobs within the San Francisco Bay Region by 2025.[2]

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1 ABAG, Center for Analysis and Information Services, *2001 Input-Output Model and Economic Multipliers for the San Francisco Bay Region*, Table 5, 1987 Bay Area Employment Multipliers, p. 20, March 2004.

2 ABAG, *Projections 2005*.

Infrastructure Capacity/Land Use Changes. The SUMC Project is an urban infill project that would increase density within a developed site and that would not involve construction of major new roadways or utility systems in undeveloped areas, which in turn would stimulate development in those undeveloped areas. Thus, the SUMC Project would not induce growth by removing infrastructure barriers or by providing new infrastructure to geographic areas that were not previously served, nor would it create new transportation access to a previously inaccessible area.

As discussed in Section 3.15, Utilities, increased electrical connections would be needed to meet the increased energy demand from the SUMC Project. The SUMC Project may require additional electrical feeder cables to supply its increase in electricity demand.[3] The SUMC Project sponsors would be required by the City to install the needed electrical feeder cables, which would require trenching along Quarry Road, Welch Road, Pasteur Drive, and on the SUMC Site. The upsizing and upgrading of the utility distribution systems for the SUMC Sites is considered a component of the SUMC Project (see Section 2, Project Description). Any changes to these utility systems would be sized to address the proposed on-site growth and would not induce additional growth beyond that associated with the SUMC Project.

Summary. In conclusion, growth and the rate of growth shape both the physical and social structure of communities. As indicated above, the SUMC Project would not result in direct population growth in the City of Palo Alto and Santa Clara County. The SUMC Project would, however, result in indirect housing demand, and direct and indirect employment growth, but not in excess of current regional ABAG projections. This growth in the number of jobs in the City of Palo Alto and Santa Clara County would not result in indirect population growth over ABAG regional population projections.

4.4 CUMULATIVE IMPACTS

CEQA Guidelines Section 15355 defines cumulative impacts as "…two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." The combination of the SUMC Project with other reasonably foreseeable probable future projects in the vicinity or region affected by the SUMC Project, defines the cumulative scenario. Cumulative impacts and the SUMC Project's contribution to the cumulative impacts are addressed in Sections 3.2 through 3.15 of this EIR. These sections identify feasible mitigation measures that would reduce the SUMC Project's cumulatively considerable contributions to cumulative impacts to less than cumulatively considerable levels. These sections also identify those contributions to cumulative impacts that would be cumulatively considerable even with the implementation of feasible mitigation measures. Please refer to those sections of the EIR for a discussion of cumulative impacts.

3 Jim Bujtor, Utilities Engineering Division, City of Palo Alto, electronic communication with PBS&J, November 18, 2008

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Section 5
Alternatives

5.1 INTRODUCTION

The California Environmental Quality Act (Public Resources Code, Section 21000 et seq.; CEQA) and the CEQA Guidelines (California Code of Regulations, Title 14, Section 15000 et seq.) require that an Environmental Impact Report (EIR) "describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project, but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives" (PRC Section 21100; CEQA Guidelines Sections 15126(d), 15126.6). If mitigation measures or a feasible project alternative that would meet most of the basic project objectives would substantially lessen the significant environmental effects of a proposed project, the lead agency should not approve the proposed project unless it determines that specific technological, economic, social, or other considerations make the mitigation measures and the project alternative infeasible (PRC Section 21002, CEQA Guidelines Section 15091(a)(3)). The EIR must also identify alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and should briefly explain the reasons underlying the lead agency's determination (CEQA Guidelines Section 15126.6(c)).

One of the alternatives that must be analyzed is the "No Project" Alternative. The "No Project" analysis must discuss the existing conditions at the time the notice of preparation is published, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved and development continued to occur in accordance with existing plans and consistent with available infrastructure and community services (CEQA Guidelines Section 15126.6(e)(2)). When the project is the revision of an existing use or regulatory plan, the "no project" alternative will be the continuation of the existing plan or use into the future (Guidelines Section 15126.6(e)(3)(A)). Therefore, pursuant with the CEQA Guidelines, this section discusses and analyzes two No Project Alternatives.

In addition to the two No Project Alternatives, this section provides a set of project alternatives to the SUMC Project and analyzes the impacts of each alternative, including two Reduced Intensity Alternatives, a Tree Preservation Alternative, a Historic Preservation Alternative, and a Village Concept Alternative. The SUMC Project sponsors have developed the Tree Preservation Alternative in order to preserve biologically and aesthetically significant oak trees located in the portion of the SUMC Project know as Kaplan Lawn, outside the proposed FIM 1 building near Pasteur Drive, and outside the new hospital building near Welch Road. The Tree Preservation Alternative maintains the same square footage and programmatic functions as the SUMC Project, but proposes design modifications to the new hospital building as well as FIM 1 to accomplish additional tree preservation. Also, in an effort to better integrate the surrounding areas and regional transit facilities with the SUMC Project, along with exploring the environmental effects of offsetting a portion of the indirect regional housing demand created by the SUMC Project, the City of Palo Alto (City) has identified a Village Concept Alternative for consideration. This section later provides a description of all alternatives and compares the significant impacts of the alternatives to the significant environmental impacts of the SUMC Project as proposed.

5.2 DESCRIPTION OF ALTERNATIVES CONSIDERED

The objectives for the SUMC Project are listed in Section 2, Project Description. As stated above, the alternatives to a project seek to feasibly attain most of the basic project objectives while avoiding or substantially lessening its significant impacts. Significant and unavoidable project-specific and cumulative impacts from the SUMC Project include:

- Deterioration of intersection level of service during Peak Hour conditions at three Menlo Park intersections (Middlefield Road and Willow Road, Bayfront Expressway and Willow Road, and University Avenue and Bayfront Expressway);
- Increased average daily traffic on four Menlo Park roadway segments, on Marsh Road, Sand Hill Road, Willow Road, and Alpine Road;
- Emission of criteria air pollutants (NOx) during construction, on both a project level and cumulative level;
- Emission of criteria air pollutants (ROG, NOx, PM_{10}) during operation, on both a project level and cumulative level;
- Contribution to cumulative emissions of toxic air contaminants;
- Emission of greenhouse gases, which would contravene the City's ability to meet emission reduction goals in the Palo Alto Climate Protection Plan and which would have a cumulatively considerable contribution to global climate change;
- Temporary but substantial noise during construction, on both a project level and cumulative level;
- Emission of ambulance noise along a new route along Sand Hill Road into the proposed Durand Way extension, so that noise levels at roadside residences would increase by a level considered unacceptable under the City's Comprehensive Plan;
- Demolition of an historical structure, the 1959 Hospital Building complex (also referred to as the Stone Building complex), which is a significant and unavoidable impact on both a project and cumulative level; and
- Removal of up to 71 Protected Trees, as defined in City of Palo Alto's Tree Protection and Management Regulations, which is a significant and unavoidable impact on both a project level and a cumulative level.

Based on the objective of substantially reducing these significant and unavoidable impacts, two No Project Alternatives, two Reduced Intensity Alternatives, two Preservation Alternatives, and the

Village Concept Alternative have been developed for the SUMC Project for evaluation in this EIR.[1] Table 5-1 provides a summary of key features of the SUMC Project and each alternative. Further details regarding each alternative are provided below.

Table 5-1
Comparative Description of SUMC Project Alternatives[a,b,c]

Alternative	Floor Area Demolished (square feet)	New Floor Area (square feet)	Net Increase (square feet)	SHC Total Beds	LPCH Total Beds
SUMC Project	1,213,759	2,525,277	1,311,518	600	361
No Project Alternatives:					
A. Retrofitting only[d]	0	0	0	0 or 456[e]	0 or 257[e]
B. Replace SB 1953 noncompliant structures	665,128	674,115	8,987	287	141
Reduced Intensity Alternatives:					
A. Right-size[f] SHC and LPCH	1,200,005	1,645,928	445,923	456	257
B. Right-size SHC and LPCH plus add floor area (in an amount less than the SUMC Project)	1,213,836	2,137,538	923,702	542	319
Preservation Alternatives:					
Tree Preservation Alternative	1,213,759	2,525,277	1,311,518	600	361
Historic Preservation Alternative	357,581	1,681,300	1,323,719	600	361
Village Concept Alternative:					
Village Concept Alternative	1,213,759	2,525,277	1,311,518	600	361

Sources:
a. PBS&J, Memorandum: "Preliminary List of Project Alternatives to the SUMC Facilities Replacement and Renewal and Simon-Properties Stanford Shopping Center Expansion EIR (for discussion)", October 29, 2007. Contrary to the indication in this memorandum, City staff has since determined that a 2015 partial buildout scenario will be applied as the SUMC Project's Reduced Intensity Alternative B.
b. Alternatives reviewed by Marlene Berkoff, FAIA, Principal, Berkoff Facility Strategies.
c. Barbara Schussman, Bingham McCutchen LLP, Memorandum: "SUMC Project Alternatives to be Evaluated in EIR," January 8, 2008 (revised September 29, 2008).

Notes:
d. One or both of the hospitals would likely close in 2030 under this alternative.
e. Depending on which hospital closes.
f. "Right-sizing" refers to increasing floor area per inpatient bed or other services. Right-sizing is a process that many hospitals undergo to conform to modern healthcare standards. The American Academy of Healthcare Architects recommends 100 percent single-bed patient rooms to ensure patient safety, privacy, and family-centered care. The SHC and LPCH hospitals suffer from an outmoded ratio of semi-private patient rooms to single-bed patient rooms, along with operating rooms, imaging rooms, ER bays, support spaces, utilities rooms, etc., and as such, need to "right-size" to conform to modern standards. Please refer to the Project Description, Section 2, of this document for a complete description of the right-sizing components.

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[1] The City of Palo Alto selected the SUMC Project Alternatives for evaluation and the project applicant supplied information as to how the project would be configured to match the alternative. Ms. Marlene Berkoff, an outside third party reviewer, then confirmed that the information was accurate and reasonable.

No Project Alternatives

Many of the existing SUMC facilities do not comply with Office of Statewide Health Planning and Development (OSHPD) requirements,[2] including Senate Bill (SB) 1953 structural and non-structural seismic safety requirements. Under SB 1953, existing acute care hospital buildings determined to be a potential risk of collapse or could cause a significant loss of life must be replaced or retrofitted to meet code standards, or converted to non-acute care hospital purposes, by 2013 (which may be extended to 2015). By 2030, all acute care hospital buildings must meet stringent performance standards established by OSHPD. The SUMC Project consists of renewal and replacement of hospital and clinic/medical office facilities of Stanford Hospital and Clinics (SHC), hospital and clinic/medical office facilities of the Lucile Packard Children's Hospital (LPCH), and laboratory/research facilities of the Stanford University School of Medicine (SoM). Some of the SHC facilities located in the original 1959 Hospital Building complex (also referred to as the Stone Building complex), which houses the SHC's inpatient hospital facilities, have been determined to be a potential risk of collapse or to pose significant loss of life such that they must comply with SB 1953 code standards for 2013 (structural Performance Category 1 Structures, or SPC-1 Structures). Non-structural renovations also would be required at other SHC facilities and at the LPCH in order to comply with the statutory deadlines. Under SB 1953, the operating licenses of the hospitals would be revoked if compliance were not achieved by the set deadlines. Thus, the No Project Alternatives would involve compliance with SB 1953 requirements.

Also, the portions of the SUMC Sites that are currently zoned Planned Facility (PF) are not built to the maximum allowable floor area under the PF zoning district. A very small amount of expansion (about 9,000 square feet) could be constructed under existing zoning. It is reasonably foreseeable that the SUMC Project sponsors would seek to buildout under the maximum allowable floor area if the SUMC Project were not approved. Therefore, as described further below, No Project Alternative B would involve demolition and replacement of existing structures to comply with SB 1953 and to buildout to the maximum allowable floor area. However, it should be noted that further investigation would need to be conducted by the SUMC Project sponsors in order to fully determine if the below No Project Alternatives are technically and economically feasible.

It is assumed that No Project Alternative A would be completed by 2015.

No Project Alternative A: Retrofitting Only/No New Structures

Under No Project Alternative A, only those hospital facilities that could be modified to meet the 2013 and 2030 deadlines would be retrofitted. No new buildings would be constructed. In the long-term,

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2 The OSHPD Facilities Development Division (FDD) is responsible for reviewing and inspecting health facility construction projects and existing facilities. FDD enforces those portions of the Title 24 building code requirements that apply to hospitals, which include structural and non-structural components, as well as the Hospital Seismic Safety Act of 1983 and SB 1953 requirements. A current list of the facilities standards enforced by FDD is maintained on the department's website at: http://www.oshpd.ca.gov/FDD/Regulations/index.html. All references to "OSHPD standards" in the text refer to the codes enforced by FDD. All references to "noncompliant structures" refer to structures that are not built to current OSHPD standards.

portions of the hospital facilities would not meet SB 1953 requirements for the 2030 deadline, and one or both of the hospitals would be closed. This alternative would require SHC and LPCH hospitals to continue to operate beyond the 2013 deadline with reduced patient capacity. By 2013, SHC would have to move hospital functions out of the portion of the original 1959 Hospital Building complex that could not be retrofitted to SB 1953 standards and into compliant existing facilities. Relocated programs would include part of patient admitting, surgical pathology, kitchen, and nursing administration. As a result, the existing SHC buildings that meet SB 1953 standards would be more crowded than current conditions and may be unable to provide some of its current programs. The LPCH and the SoM would continue to use existing buildings for medical treatment, research, and teaching purposes, subject to seismic retrofit work.

Under this alternative, there would be no new construction at the Hoover Pavilion Site and the interior of the existing Hoover Pavilion building would not need to be renovated to relocate the users of 1101 Welch Road. The demolition of existing sheds at that site would not occur and no rezoning, annexation, or changes to existing land use designations would be required. In addition, this alternative would include no function upgrades to meet current standards and technological requirements.

For the purposes of the alternatives analysis, the following steps are assumed to be sufficient to meet SB 1953 retrofitting standards for the hospital facilities by the preliminary 2013 deadline, thereby allowing at least one hospital to remain open through 2030:

- The portions of the 1959 Hospital Building complex that have been rated SPC-1, and therefore do not comply with SB 1953 structural requirements for 2013 (Boswell Clinics Building, East Core, and West Core), would be separated from the remainder of the 1959 Hospital Building complex (Central Core, East Pavilion, and West Pavilion) by a four-hour fire separation barrier.
- Non-structural retrofit work would be performed on the remainder of the 1959 Hospital Building complex (which houses 188 beds), the 1973 Core Expansion Building, and the 1989 Hospital Modernization Project Building. No beds would be lost in the near term (by 2013), although some beds would be temporarily lost during the retrofit work.
- All utility lines that traverse noncompliant portions of the 1959 Hospital Building complex would be capped and rerouted around the noncompliant structures to the remaining hospital structures.
- Separate utility lines would be extended to the noncompliant portions of the 1959 Hospital Building complex to ensure that those buildings would comply with applicable City building standards. SHC has determined that it would be infeasible to cap and relocate utility lines and construct a fire proof separation barrier while keeping the current hospital facilities open.[3]

[3] The City of Palo Alto peer reviewer (Marlene Berkoff, FAIA, Principal, Berkoff Facility Strategies) expressed concurrence with this assessment. See written correspondence from the City of Palo Alto to PBS&J, January 7, 2009.

- Programs required to meet standards set by OSHPD for hospitals would be relocated from the SPC-1 portion of the 1959 Hospital Building complex into the retrofitted space, requiring the relocation of staff and equipment. Relocated programs would include part of patient admitting, surgical pathology, kitchen, and nursing administration.
- At LPCH, code-required non-structural renovations to existing hospital facilities would be needed to meet the 2013 deadline. No beds would be lost in the near term (by 2013), although some beds would be temporarily lost during the retrofit work. The temporary loss of beds at LPCH under the No Project Alternative A would be approximately 64 intensive care beds that are contained in multi-bed rooms. If the retrofits in these rooms were all done in a single construction phase, the construction period would be about one year. If the retrofit were phased to reduce the number of beds out of commission at any one time, a single multi-bed room (containing four to 11 beds) would be temporarily out of commission at any given time during a two-year construction period.
- It might be physically possible for the SoM to continue to use its existing research facilities within the original 1959 Hospital Building complex once they are separated from hospital facilities by a fire barrier. In that case, the facilities would need to be retrofitted to conform to City of Palo Alto seismic safety requirements rather than OSHPD requirements. Substantial exterior bracing likely would be needed. It is not known for certain whether such compliance would be possible, but for purposes of the alternatives analysis, it is reasonable to conclude that it would be possible. Refer to the Historic Preservation Alternative (below) for more information about the work needed to use the existing buildings for SoM purposes and the effects on SoM's anticipated programs.
- There would be no change in parking from existing conditions.

This alternative would not enable SHC to comply with the requirements of SB 1953 that must be met by 2030. By 2030, SHC would need to move all hospital functions out of the remainder of the 1959 Hospital Building complex. Those functions include 188 patient beds and associated support areas, and necessary functions serving both hospitals, including kitchen facilities and part of the nursing administration facilities. As a practical consequence, one of the two hospitals would close by 2030 to provide space for shared hospital functions and enough beds for one of the hospitals. If, for example, SHC were to continue to operate until 2030, then neither hospital could operate in 2030 when the necessary shared facilities would need to be closed. Alternatively, one hospital could shut down earlier than 2030, and the other could acquire its newer building space in order to replace the necessary facilities to be shut down by 2030. Potentially, one of the two hospitals could continue to operate if the patient admitting unit, kitchen, surgical pathology laboratory, and nursing administration facilities were moved out of the 1959 Hospital Building complex into a retrofitted space. However, spatial, economic, or other constraints could make operation of both the SHC and the LPCH past 2030 infeasible.

No Project Alternative B: Replace SB 1953 Noncompliant Structures at Maximum Allowable FAR

Under No Project Alternative B, hospital facilities that are not compliant with OSHPD structural standards would be replaced with new structures. New structures would be built out to the maximum size allowed under PF zoning. Under PF zoning for the Main SUMC Site, the maximum allowable floor to area ratio (FAR) is 1.0. The existing SUMC structures on the Main SUMC Site within the area zoned for PF, inboard of Welch Road, total 2,189,018 square feet on a 2,198,082-square-foot site. As a result, an approximately 9,000-square-foot expansion of hospital facilities on the PF site could be achieved under the current zoning. It should be noted that the 701 and 703 Welch Road properties and the proposed site for the Durand Way extension are zoned MOR (not PF). The existing buildings on the Hoover Pavilion Site occupy the entire amount of the 0.25 FAR allowed on that site under existing PF zoning; therefore, no buildings would be added at this location. No rezoning, annexation, or changes to existing land use designations would be required to replace the SB 1953 noncompliant buildings with the maximum allowable FAR.

LPCH would continue to use its existing facilities, with non-structural renovations made to noncompliant critical care areas. The SoM functions presently are located in other portions of the 1959 Hospital Building complex (Grant, Alway, Lane, and Edwards Buildings) and would continue to occupy those areas under this alternative. In addition, the existing buildings and storage sheds on the Hoover Pavilion Site would be preserved. It is assumed that No Project Alternative B would be completed by 2015.

Retrofitting and replacement of hospital facilities under No Project Alternative B would involve the following actions, which are reflected in Table 5-2, below:

- The 441,201-square-foot portion of the 1959 Hospital Building complex occupied by SHC (East Building, West Building, Core Building, and Boswell Clinics Building) and the 223,850-square-foot 1973 Core Expansion Building would be demolished (356,875 square feet of the demolished structures currently are being used for hospital uses and 308,176 square feet of the demolished structures are currently being used for clinic/medical office uses). The 77-square-foot entry would also be demolished.
- The 665,128 square feet of SHC space lost due to demolition would be replaced. The new replacement SHC Hospital structures would total 365,939 square feet (equal to the SHC portion of the 1959 Hospital Building complex that is used for hospital purposes and the 1973 Core Expansion Building that would be demolished, plus approximately 9,000 additional square feet allowed under existing zoning). The replacement hospital structure could not be located on the sites of the demolished 1959 Hospital Building complex and 1973 Core Expansion Building because the existing SHC Hospital would continue to operate while the replacement building was under construction. Furthermore, the replacement building would need to be physically connected to the portion of the existing hospital that would remain. Therefore, Parking Structure 3 (700 spaces) would be demolished (as under the SUMC Project), and the replacement hospital would be built in its place. In addition, there would be 308,176 square feet of clinic/medical office replacement, for a total of 674,115 new square feet for SHC at the Main SUMC Site.

Table 5-2
No Project Alternative B: Demolition and Replacement (Compared to SUMC Project)[a,b,c]

Building	Use	No Project Alternative B Demolition/Replacement (square feet)	SUMC Project Demolition/Replacement (square feet)
Demolitions			
1959 Hospital Building complex	SHC Hospital	-133,025	-133,025
1973 Core Expansion Building	SHC Hospital	-223,850	-223,850
SHC Entry	SHC Hospital	-77	-77
1959 Hospital Building complex	SHC Clinic/ Medical Office	-308,176	-308,176
1101 Welch Road	SHC Clinic/ Medical Office	0[d]	-40,100
701 and 703 Welch Road	Non-SUMC Clinic/Medical Office	0	-79,800
1959 Hospital Building complex (Lane, Grant, Alway, Edward)	SoM Research/Laboratory	0	-414,977
Hoover Pavilion- misc. (shops and storage)	Hoover Pavilion Shops/Storage	0	-13,831
Subtotal Demolition		-665,128	-1,213,836
New Buildings[d]			
Replacement SHC Hospital	SHC Hospital	366,016[d]	1,100,000
New LPCH Hospital	LPCH Hospital	0	471,300
Replacement SHC Clinic/Medical Offices	SHC Clinic/Medical Office	308,176	429,000
New LPCH Clinic/Medical Offices	LPCH Clinic/Medical Office	0	50,000
FIM 1, 2, and 3	SoM Research/Laboratory	0	414,977
Hoover Pavilion New Medical Office	Hoover Pavilion Clinic/Medical Office	0	60,000
New Building Subtotal		674,115	2,525,277
Net Increase		**8,987**	**1,311,441**

Sources:
a. PBS&J, Memorandum: "Preliminary List of Project Alternatives to the SUMC Facilities Replacement and Renewal and Simon-Properties Stanford Shopping Center Expansion EIR (for discussion)", October 29, 2007.
b. Alternatives reviewed by Marlene Berkoff, FAIA, Principal, Berkoff Facility Strategies.
c. Barbara Schussman, Bingham McCutchen LLP, Memorandum: "SUMC Project Alternatives to be Evaluated in EIR," January 8, 2008 (revised September 29, 2008).

Notes:
d. This alternative assumes a 50-foot height limit, but it is not certain that the replacement SHC Hospital could fit on the site given current floor-to-ceiling ratios. As such, it might be necessary to demolish 1101 Welch Road.
e. Does not include new parking garages.

- Non-structural retrofit work would be performed on the 1989 Hospital Modernization Project Building.
- Non-structural retrofit work would be performed on LPCH.
- The 700 parking spaces currently located in Parking Structure 3 would be replaced in a new underground structure near the intersection of Welch Road and Pasteur Drive.
- It might be physically possible for the SoM to continue to use its existing research facilities within the 1959 Hospital Building complex once they are separated from hospital facilities by a fire barrier. In that case, the SoM facilities would need to be retrofitted to conform to City of Palo Alto seismic safety requirements rather than OSHPD requirements. Substantial exterior bracing likely would be needed. It is not known for certain whether such compliance would be possible, but for purposes of the alternatives analysis, it is reasonable to conclude that it would be possible.

No Project Alternative B would result in a permanent decrease in patient beds because SHC would need to use some of the replacement square footage to right-size its facilities. Applying the same ratio of 2,552 square feet per bed, as is contemplated under the proposed SUMC Project, approximately 143 beds would be located in the replacement building. Combined, the reconfigured D, E, & F nursing units in the existing, remaining structure, and the new replacement structure would accommodate 287 total beds as compared to the requested 600 beds in the proposed project or the 456 beds in the current structure.

This scenario would mean that no added expansion space would occur at the LPCH in order to alleviate existing overcrowded conditions. Either LPCH would continue to operate as it does under current conditions, with no change in beds, or LPCH would reduce its existing beds in order to provide more space per bed as a right-sizing measure. If right-sizing occurs, applying the same ratio of 1,938 square feet per LPCH bed, as is contemplated by the SUMC Project, would result in 141 total beds at LPCH as compared to the requested 361 beds in the proposed project or the 257 beds in the current structure.

Reduced Intensity Alternatives

Reduced Intensity Alternative A: Right-Size SHC and LPCH Facilities without Adding Beds

Under Reduced Intensity Alternative A, noncompliant facilities would be demolished and replaced with new structures. All other uses on the Main SUMC Sites would remain the same as under current conditions, subject to minor seismic retrofit work. In addition, the Hoover Pavilion would be internally renovated to accommodate additional clinic and office uses; however, no new structures would be constructed at this site. Construction of new hospital facilities would be limited to the minimum additional square footage required to right-size the existing LPCH and SHC facilities without adding space for additional growth. This alternative would expand the hospitals' existing floor area to provide additional space for the hospitals' existing number of beds, associated support areas, and emergency room. Unlike the previous two alternatives, the implementation of Reduced Intensity Alternative A would require rezoning of the Main SUMC Sites to accommodate proposed development intensities because the PF-zoned area is almost entirely built out under existing conditions. This alternative also would necessitate annexation of the 0.75-acre portion of the Main SUMC Site and would involve construction above the 50-foot height limit, requiring Comprehensive Plan amendments and zoning changes.

It should be noted that right-sizing refers to increasing floor area per inpatient bed or service. Right-sizing is a process that many hospitals undertake to conform to modern healthcare standards. The American Academy of Healthcare Architects recommends 100 percent single-bed patient rooms to ensure patient safety, privacy, and family centered care. The SUMC applicants maintain that the SHC and LPCH hospitals suffer from an outmoded ratio of semi-private patient rooms to single-bed patient rooms and treatment space and as such need to "right-size" to conform to modern standards. Therefore, while right-sizing would increase floor area, it would not involve an increased level of operations. Replacing the SHC and LPCH hospitals while bringing them into compliance with SB 1953 standards would involve the following actions, which are reflected in Table 5-3, below:

- The 441,201-square-foot portion of the 1959 Hospital Building complex occupied by the SHC Hospital (East Building, West Building, Core Building, and Boswell Clinics Building), the 223,850-square-foot 1973 Core Expansion Building, and the 40,100-square-foot building at 1101 Welch Road would be demolished, for a total of 705,151 square feet of demolished structures (356,875 square feet of the demolished structures are currently being used for hospital uses and 348,276 square feet of the demolished structures are currently being used for clinic/medical office uses). The 77-square-foot entry also would be demolished.
- The 79,800 square feet of buildings at 701 Welch Road and 703 Welch Road would be demolished.
- A new SHC Hospital structure would be constructed to replace the 356,875 square feet of demolished hospital structures (portions of 1959 Hospital Building complex and Core Expansion) plus 320,000 square feet for right-sizing the existing 456 beds, associated support areas and the emergency/trauma room at SHC. The replacement structure could not be located on the sites of the demolished 1959 Hospital Building complex and 1973 Core Expansion Building because the existing SHC Hospital would continue to operate while the replacement building is under construction. Furthermore, the replacement building would need to be physically connected to the portion of the existing hospital that would remain. For the purposes of this analysis, it is assumed that a hospital module in Kaplan Lawn would not be constructed. The new SHC Hospital building would total approximately 676,875 square feet, instead of 1,100,000 square feet with the SUMC Project (additional space also may be needed to right-size other space, such as imaging and operating rooms).
- New SHC clinic structures would be constructed to replace the 348,276 square feet of demolished clinic and medical office uses (portions of the 1959 Hospital Building complex and 1101 Welch Road).
- Non-structural retrofit work would be performed on the 1989 Hospital Modernization Project Building.

Table 5-3
Reduced Intensity Alternative A: Demolition and Replacement (Compared to SUMC Project)[a,b,c]

Building	Use	Reduced Intensity Alternative A Demolition/Replacement (square feet)	SUMC Project Demolition/Replacement (square feet)
Demolitions			
1959 Hospital Building complex	SHC Hospital	-133,025	-133,025
1973 Core Expansion Building	SHC Hospital	-223,850	-223,850
SHC Entry	SHC Hospital	-77	-77
1959 Hospital Building complex	SHC Clinic/Medical Office	-308,176	-308,176
1101 Welch Road	SHC Clinic/Medical Office	-40,100	-40,100
701 and 703 Welch Road	Non –SUMC Clinic/Medical Office	-79,800	-79,800
1959 Hospital Building complex (Lane, Grant, Alway, Edward)	SoM Research/Laboratory	-414,977	-414,977
Hoover Pavilion- misc. (shops and storage)	Hoover Pavilion Shops and Storage	0	-13,831
Subtotal Demolition		-1,200,005	-1,213,836
New Buildings[d]			
Replacement SHC Hospital	SHC Hospital	676,875	1,100,000
New LPCH Hospital	LPCH Hospital	205,800	471,300
Replacement SHC Clinic/Medical Offices	SHC Clinic/Medical Office	348,276	429,000
New LPCH Clinic/Medical Offices	LPCH Clinic/Medical Office	0	50,000
FIM 1, 2, and 3	SoM Research/Laboratory	414,977	414,977
Hoover Pavilion New Medical Office	Hoover Pavilion Clinic/Medical Office	0	60,000
New Building Subtotal		1,645,928	2,525,277
Net Increase		**445,923**	**1,311,441**

Sources:

a. PBS&J, Memorandum: "Preliminary List of Project Alternatives to the SUMC Facilities Replacement and Renewal and Simon-Properties Stanford Shopping Center Expansion EIR (for discussion)", October 29, 2007.

b. Alternatives reviewed by Marlene Berkoff, FAIA, Principal, Berkoff Facility Strategies.

c. Barbara Schussman, Bingham McCutchen LLP, Memorandum: "SUMC Project Alternatives to be Evaluated in EIR," January 8, 2008 (revised September 29, 2008).

Note:

d. Does not include new parking garages.

- Non-structural retrofit work would be performed on the existing LPCH building, which would be retained.
- A new LPCH hospital structure would be constructed to replace the 79,800 square feet of demolished structures and provide 126,000 square feet for right-sizing the existing 257 beds and associated support areas. This new LPCH building would total approximately 205,800 square feet (additional space also may be needed to right-size other space).
- Parking spaces in Parking Structure 3 would be replaced, which likely would be demolished in order to build the replacement hospital. It is anticipated that replacement of these 700 parking spaces would be in an underground structure near the intersection of Welch Road and Pasteur Drive.
- SoM facilities would be demolished and replaced without increasing the square footage of those facilities. This replacement would entail demolition of the portions of the 1959 Medical Center complex that are occupied by the SoM (Grant, Alway, Lane, and Edwards Buildings) and replacement of the same amount of square footage (414,977 square feet) with the proposed Foundations in Medicine (FIM) 1, 2, and 3 buildings.

Reduced Intensity Alternative B: Right-Size SHC and LPCH Facilities Plus Add Floor Area in an Amount Less Than the SUMC Project

Under the SUMC Project, construction of the Stanford Hospitals and Clinics (SHC) and Lucile Packard Children's Hospital (LPCH) hospital would be completed by 2015, along with other SUMC Project components. Although several components of the SUMC Project would be constructed by 2015, full occupancy of the hospitals would not occur until 2025. It is anticipated that approximately 58 percent of net new growth in employment and patient activity would occur by 2015 under the SUMC Project. Thus, 2015 trip generation is predicted to be 60 percent of project-related trip generation at buildout.[4] Therefore, using this 60-percent threshold, the additions proposed under Reduced Intensity Alternative B would be approximately 60 percent of the floor area of the SUMC Project medical offices and 60 percent of the floor area of the SUMC Project hospital space above the amounts needed for right-sizing.

Reduced Intensity Alternative B would include all of the components of Reduced Intensity Alternative A, but would also include additional square footage for clinics/medical offices, research facilities, and other non-hospital uses. Reduced Intensity Alternative A, described above, includes the components necessary to right-size the existing facilities at SHC and LPCH. Reduced Intensity Alternative B would require construction above the 50-foot height limit; therefore, like Reduced Intensity Alternative A, Comprehensive Plan amendments, zoning changes, and annexation would be necessary under this alternative.

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[4] Fehr & Peers, 2015 Trip Generation Estimates for Stanford University Medical Center Environmental Impact Report. Memorandum from Robert Eckols, P.E. to Catherine Palter, Stanford Land Use and Environmental Planning, Bill Phillips, Stanford Real Estate, and Barbara Schussman, Bingham McCutchen, dated November 14, 2007. These assumptions were confirmed by AECOM Transportation.

Replacing the SHC and LPCH hospitals while bringing them into compliance with SB 1953 standards, right-sizing, and adding new floor area (60 percent of the floor area proposed under the SUMC Project) would involve the following actions, which are reflected in Table 5-4, below:

- The 441,201-square-foot portion of the 1959 Hospital Building complex occupied by the SHC (East Building, West Building, Core Building, and Boswell Clinics Building), the 223,850-square-foot 1973 Core Expansion Building, and the 40,100-square-foot building at 1101 Welch Road would be demolished, for a total of 705,151 square feet of demolished structures. Approximately 356,875 square feet of the demolished structures are currently being used for hospital uses and 348,276 square feet of the demolished structures are currently being used for clinic/medical office uses. The 77-square-foot entry also would be demolished.

- Non-structural retrofit work would be performed on the 1989 Hospital Modernization Project Building.

- A new SHC Hospital structure would be constructed to replace the 356,875 square feet of demolished hospital structures (portions of original 1959 Hospital Building complex and Core Expansion); add 320,000 square feet for right-sizing the existing 456 beds, associated support areas, and the emergency/trauma room at SHC; and add 60 percent of the proposed new square footage above right-sizing attributed to growth at SHC Hospital. The replacement structure could not be located on the sites of the demolished 1959 Hospital Building complex and 1973 Core Expansion Building because the existing SHC Hospital would continue to operate while the replacement building is under construction. Furthermore, the replacement building would need to be physically connected to the portion of the existing hospital that would remain. For the purposes of this analysis, it is assumed that a hospital module in Kaplan Lawn would not be constructed. The new SHC Hospital structure would total 930,750 square feet (instead of 1,100,000 square feet under the SUMC Project). This would result in approximately 60 percent of the SUMC Project's additional 144 beds, or 86 additional beds under Reduced Intensity Alternative B. Combining the existing beds to be retained (456 beds) plus the beds to be added (86 beds), there would be 542 SHC beds under this alternative instead of 600 beds under the SUMC Project.

- New SHC clinic structure would be constructed to replace the 348,276 square feet of demolished clinics (portions of the original 1959 Hospital Building complex and 1101 Welch Road) and add 60 percent of the proposed new square footage attributed to growth at SHC clinics/medical offices. The new SHC clinic structures would total 396,711 square feet (instead of 429,000 square feet under the SUMC Project).

- The 79,800 square feet of buildings at 701 Welch Road and 703 Welch Road would be demolished and would relocate occupants off-site, as described under the SUMC Project.

- Non-structural retrofit work would be performed on the existing LPCH building.

Table 5-4
Reduced Intensity Alternative B: Demolition and Replacement (Compared to SUMC Project)[a,b,c]

Building	Use	Reduced Intensity Alternative B Demolition/Replacement (square feet)	SUMC Project Demolition/Replacement (square feet)
Demolitions			
1959 Hospital Building complex	SHC Hospital	-133,025	-133,025
1973 Core Expansion Building	SHC Hospital	-223,850	-223,850
SHC Entry	SHC Hospital	-77	-77
1959 Hospital Building complex	SHC Clinic/Medical Office	-308,176	-308,176
1101 Welch Road	SHC Clinic/Medical Office	-40,100	-40,100
701 and 703 Welch Road	Clinic/Medical Office	-79,800	-79,800
1959 Hospital Building complex (Lane, Grant, Alway, Edward)	SoM Research/Laboratory	-414,977	-414,977
Hoover Pavilion- misc. (shops and storage)	Hoover Pavilion Shops and Storage	-13,831	-13,831
Subtotal Demolition		-1,213,836	-1,213,836
New Buildings[d]			
Replacement SHC Hospital	SHC Hospital	930,750	1,100,000
New LPCH Hospital Structure	LPCH Hospital	365,100	471,300
Replacement SHC Clinic/Medical Offices	SHC Clinic/Medical Office	396,711	429,000
New LPCH Clinic/Medical Offices	LPCH Clinic/Medical Office	30,000	50,000
FIM 1, 2, and 3	SoM Research/Laboratory	414,977	414,977
Hoover Pavilion New Medical Office	Hoover Pavilion Clinic/Medical Office	0	60,000
New Building Subtotal		2,137,538	2,525,277
Net Increase		**923,702**	**1,311,441**

Source:

a. PBS&J, Memorandum: "Preliminary List of Project Alternatives to the SUMC Facilities Replacement and Renewal and Simon-Properties Stanford Shopping Center Expansion EIR (for discussion)", October 29, 2007. Contrary to the indication in this memorandum, City staff has since determined that a 2015 partial buildout scenario will be applied as the SUMC Project's Reduced Intensity Alternative B.

b. Alternatives reviewed by Marlene Berkoff, FAIA, Principal, Berkoff Facility Strategies.

c. Barbara Schussman, Bingham McCutchen LLP, Memorandum: "SUMC Project Alternatives to be Evaluated in EIR," January 8, 2008 (revised September 29, 2008).

Note:

d. Does not include new parking garages.

- A new LPCH hospital structure would be constructed to replace the demolished 79,800 square feet and add 126,000 square feet for right-sizing the existing 257 beds and associated support areas. In addition, 60 percent of the proposed square footage above right-sizing that is attributed to growth at LPCH hospital would be added. The new LPCH hospital would total 365,100 square feet (instead of 471,300 square feet). This would result in approximately 60 percent of the SUMC Project's additional 104 beds, or 62 additional beds. Combining the existing beds to be retained (257 beds) plus the beds to be added (62 beds), there would be 319 LPCH beds under this alternative, instead of 361 beds under the SUMC Project. Additional space also may be needed to right-size other space.
- A new LPCH clinic structure would be constructed, which would add 60 percent of the proposed growth at the LPCH clinics for a total of 30,000 square feet.
- The users of 1101 Welch Road would be relocated to a renovated Hoover Pavilion building; however, no new medical buildings would be added at the Hoover Pavilion Site.
- Approximately 2,000 parking spaces would be constructed to replace the 700 spaces demolished for construction and to add 1,300 parking spaces required for additional demand. Approximately 425 spaces would be constructed at the LPCH as with the SUMC Project; 875 surface and underground structured spaces would be constructed at the intersection of Pasteur Drive and Welch Road; and 700 structured spaces would be constructed at the Hoover Pavilion Site in the same location as that proposed under the SUMC Project Site Plans to replace Parking Structure 3. In order to construct the structured parking garage at the Hoover Pavilion Site, 13,831 square feet of sheds and storage space would be demolished.
- SoM facilities would be demolished and replaced without increasing the square footage of those facilities. This would entail demolition of the portions of the Original Medical Center Complex that are occupied by the SoM (Grant, Alway, Lane, and Edwards Buildings) and replacement of the same amount of square footage (414,977 square feet) with the proposed FIM 1, 2 and 3 buildings. As with the SUMC Project, this would not increase use of operations at the SoM facilities.

Preservation Alternatives

Tree Preservation Alternative

The Tree Preservation Alternative was designed to reduce the SUMC Project's impact on Protected Trees. The Tree Preservation Alternative would seek to preserve the majority of the aesthetically and biologically significant Protected Trees at Kaplan Lawn, the FIM 1 Grove, and along Welch Road. Under this alternative, Kaplan Lawn would not be developed, and no Protected Trees would be removed at that location. In addition, the FIM 1 building would be redesigned to save as many Protected Trees as possible in this area. Lastly, two Protected oak trees along Welch Road would be retained. The site plan for this alternative would avoid 13 biologically and aesthetically significant Protected Trees that would be affected by the SUMC Project. Further, this alternative would seek to relocate three more Protected Trees that would otherwise be affected under the SUMC Project.

Figure 5-1 shows the Protected Trees that would be preserved through the Tree Preservation Alternative, and the potential zones for planting of relocated trees. This alternative is described in more detail below.

Under the Tree Preservation Alternative (as well as the SUMC Project), a new zoning district would be created for land uses specifically for hospitals, associated medical research, medical office, and support uses. As described in Section 2, Project Description, regulations in this district would include applicability, preservation, and exemptions for removal and replacement of Protected Trees. The Hospital District would create a procedure to permit the removal of approximately 48 Protected Trees at the SUMC Sites while preserving approximately 23 Protected Trees that are considered both biologically and aesthetically significant, as defined in Section 3.9, Biological Resources. The approximately 23 Protected Trees that would be required to be retained are located in the following areas:

- *Kaplan Lawn.* Kaplan Lawn is the undeveloped area located between the two barrels of Pasteur Drive to the west and east, Blake-Wilbur Drive to the north, and the SUMC Promenade and fountain to the south. Within Kaplan Lawn are two existing groves that consist of nine oak trees. Some of these Protected Trees are over a century old, with many pre-dating the original hospital and are a remnant of the native oak grassland and agricultural use of the area. The north grove on the Kaplan Lawn functions as a prominent left-side component of the Pasture Drive gateway.
- *FIM 1 Grove.* The FIM 1 Grove is located on the parcel of land that would house the proposed SoM FIM 1 building under the SUMC Project. Within the FIM 1 Grove are a total of 12 Protected Trees that would be removed under the SUMC Project. These oak trees function as the right side component of the Pasteur Drive gateway, the canopy of which arches over the road towards the trees in the Kaplan Lawn area.
- *Adjacent to Welch Road.* A century-old solitary oak is growing at the edge of the Main SUMC Site, between Welch Road to the north and the Blake-Wilbur Clinic building to the south. This existing Protected Tree is unique in character and prominently visible from Welch Road and the proposed Durand Way. The oak is located next to one of the original Governor's Lane eucalyptus trees and has a significant canopy spread. In addition, a mature and healthy Protected oak tree is located to the east of the proposed LPCH hospital building, along Welch Road.

The SUMC Project would remove up to 71 Protected Trees as defined in City of Palo Alto's Tree Protection and Management Regulations. While Mitigation Measures BR-4.1 through BR-4.6 would strive to avoid, relocate, or replace affected Protected Trees, the measures would not fully reduce the impacts to all Protected Trees, resulting in a significant and unavoidable impact (see Section 3.9, Biological Resources). As discussed in Section 3.9, Biological Resources, the SUMC Project would result in the removal of several of the Protected Trees defined as biologically and aesthetically significant. However, the Tree Preservation Alternative would seek to preserve the majority of the biologically and aesthetically significant Protected Trees at Kaplan Lawn, the FIM 1 Grove, and along Welch Road. Under the SUMC Project, a 64-foot-tall SHC Hospital module ("Hospital Module Six") is proposed to be constructed on the Kaplan Lawn, which would result in the removal of nine Protected Trees. The main difference under the Tree Preservation Alternative is that the square footage and programmatic functions planned for Hospital Module Six would be incorporated into the remaining five SHC Hospital modules. This new modular plan of the SHC Hospital building would be "tightened" somewhat through the use of a smaller structural grid and a reconfigured ambulance route. As such, Kaplan Lawn would not be developed, and no Protected Trees would be removed at that location. In addition, the FIM 1 building would be redesigned to save as many Protected Trees as possible in this area.

Figure 5-1 depicts the footprints of the Tree Preservation Alternative, including the alternative designs for the new SHC Hospital building and the FIM 1 building. Table 5-1 shows the Protected Trees that would be preserved through the Tree Preservation Alternative, and the potential zones for planting of relocated trees. As shown in Table 5-5, the Tree Preservation Alternative would have the same development program as the proposed SUMC Project.

The SUMC Project would include a new SHC Hospital building at Pasteur Drive and Welch Road. Under the SUMC Project, a platform or pavilion would be constructed to a height of about 40 feet. Several modules would rise above this platform, with space between the modules to provide light and air, reduce massing, house the mechanical equipment for the levels above, and maintain view corridors. As shown in Table 5-5 and Figure 5-1, the Tree Preservation Alternative would be similar to the SUMC Project, with the following exceptions:

SHC Site

- Hospital Module Six, as proposed under the SUMC Project, would not be constructed in Kaplan Lawn. The program that is currently proposed for Hospital Module Six would be absorbed into the remaining portion of the SHC Hospital building footprint off Welch Road and Pasteur Drive. Although the resulting SHC Hospital building square footage would be the same as under the SUMC Project, the design would change in the following ways:
  - The first four floors (below-grade and Levels 1, 2, and 3) of the central portion of the new SHC Hospital building would contain enclosed program, along with an atrium (rather than courtyard space, as proposed under the SUMC Project), extending from Floor 1 to Floor 3.
  - The central atrium would include a glass-domed ceiling at Level 3 and the area above the atrium would remain open.
  - The four SHC Hospital modules surrounding the central atrium would be seven stories tall, using the full amount of the 130-foot height envelope identified for the proposed SUMC Project.
  - The fifth SHC Hospital module, at the northeast corner of the proposed new SHC Hospital building, would be seven stories tall (130 feet). This height also matches the height identified under the proposed SUMC Project.
  - Additional "platform" area would be located northeast of the SHC Hospital building, containing additional diagnostic and treatment programs.

Table 5-5
Tree Preservation Alternative: Demolition and Replacement (Compared to SUMC Project)[a,b]

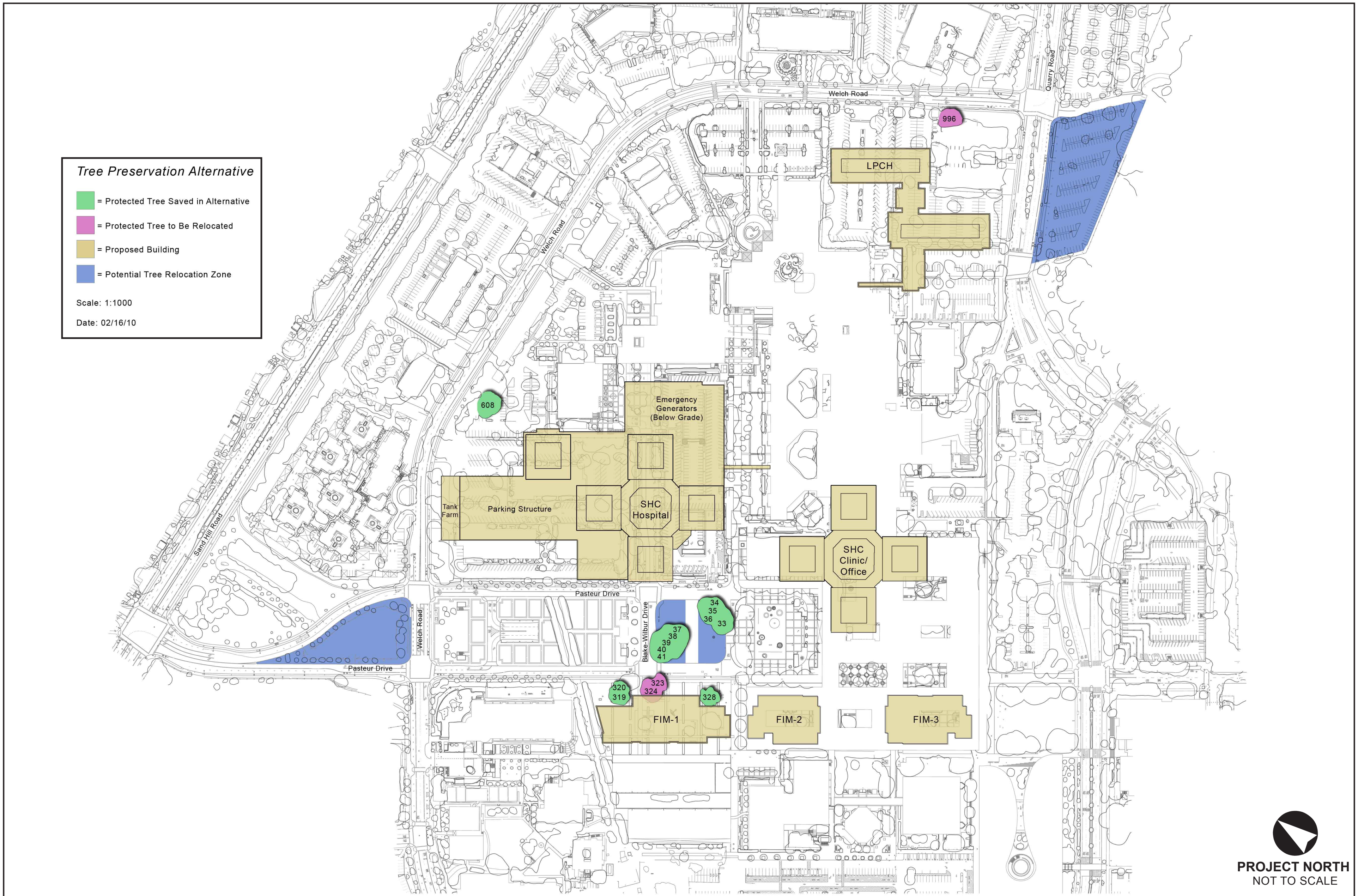
Building	Use	Tree Preservation Alternative Demolition/ Replacement (square feet)	SUMC Project Demolition/Replacement (square feet)
Demolitions			
1959 Hospital Building complex	SHC Hospital	-133,025	-133,025
1973 Core Expansion Building	SHC Hospital	-223,850	-223,850
SHC Entry	SHC Hospital	-77	-77
1959 Hospital Building complex	SHC Clinic/Medical Office	-308,176	-308,176
1101 Welch Road	SHC Clinic/Medical Office	-40,100	-40,100
701 and 703 Welch Road	Clinic/Medical Office	-79,800	-79,800
1959 Hospital Building complex (Lane, Grant, Alway, Edward)	SoM Research/Laboratory	-414,977	-414,977
Hoover Pavilion- misc. (shops and storage)	Hoover Pavilion Shops and Storage	-13,831	-13,831
Subtotal Demolition		-1,213,836	-1,213,836
New Buildings[b]			
Replacement SHC Hospital	SHC Hospital	1,100,000	1,100,000
New LPCH Hospital Structure	LPCH Hospital	471,300	471,300
Replacement SHC Clinic/Medical Offices	SHC Clinic/Medical Office	429,000	429,000
New LPCH Clinic/Medical Offices	LPCH Clinic/Medical Office	50,000	50,000
FIM 1, 2, and 3	SoM Research/Laboratory	414,977	414,977
Hoover Pavilion New Medical Office	Hoover Pavilion Clinic/Medical Office	60,000	60,000
New Building Subtotal		2,525,277	2,525,277
Net Increase		**1,311,441**	**1,311,441**

Source:

a. SUMC, "Tree Preservation Alternative," email from Catherine Palter to PBS&J on March 23, 2010.

Note:

b. Does not include new parking garages.



Source: Stanford University Medical Center, March 2010.

PBS&J

FIGURE 5-1
Tree Preservation Alternative Site Plan

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- The “tightened” module footprint would result in a height change at the SHC clinic/medical office building at the terminus of Pasteur Drive. In order to accommodate the same square footage as under the SUMC Project, but in a smaller module footprint, all four modules would be 112 feet tall (as compared to the SUMC Project, which would have one module at 112 feet and three modules at 64 feet).
- The emergency generators to serve the SHC facilities would be relocated from near Welch Road to a new location near the Advanced Medicine Center. The generators would be located underground and would have exhaust stacks that would extend 20 feet in height.
- The ambulance route to and from the emergency department at the SHC Hospital building would be reconfigured to avoid the century-old solitary oak at the edge of the Main SUMC Site, adjacent to Welch Road. In addition, the fifth SHC Hospital module would be farther from the century-old oak tree than under the SUMC Project.
- An area southeast of the Welch Road/Pasteur Drive intersection would be planted with relocated and replacement oak trees, which would not be possible under the SUMC Project.
- The SUMC Project underground parking structure at the Welch Road/Pasteur Drive intersection would be constructed as a structure with three levels underground and four levels aboveground, along Welch Road. This change to the parking garage would enhance overall design and function and reduce construction costs.
    - The parking structure would be approximately 40 feet tall. This height would match the height of the base pavilion for the new SHC Hospital building, enabling access to the parking structure roof from the base pavilion and enhancing the cohesiveness of the overall Hospital design. The 40-foot parking structure would also break up the scale of the SHC Hospital modules, transitioning the massing of the complex toward the scale of the existing buildings along Welch Road. However, the number of parking spaces in the structure would remain the same as under the SUMC Project.
    - The roof of the parking garage would support a “Wellness Center” program that would be in a structure that would be up to approximately 12 feet above the roof of the parking structure (52 feet tall from ground level). The parking structure also would be activated with street-level facilities, such as bicycle parking and lockers.
    - The parking structure would be accessed from both Welch Road and Pasteur Drive.
- The Emergency Department entrance/parking would be moved from its proposed location under the SUMC Project along Welch Road to the Pasteur Drive side of the new SHC Hospital building. This is expected to substantially improve way-finding and would enhance the overall efficiency of the Emergency Department.
- The SHC patient and visitor drop-off loop would continue to be from Pasteur Drive; however, the drop-off loop would be located farther down Pasteur Drive than previously depicted, more centrally located adjacent to the future clinics expansion and the existing D, E, and F pods.

- In order to activate the pedestrian experience at the entry level to the new SHC Hospital building, the building perimeter would be planned to accommodate the public functions of the hospital building program: the café, gift shop, outdoor seating, and a small retail component. The West Elevation (along Pasteur Drive) and the South Elevation (along the Promenade) would feature a 30-foot building overhang, providing shade and shelter from the rain along the walkways. These overhangs would also shelter the Marguerite shuttle stop and extensive bicycle parking.
- Portions of the Main SUMC Site are susceptible to liquefaction; therefore, under the Tree Preservation Alternative, the SHC Hospital foundation should be supported by piles in order to meet OSHPD's heightened standards for hospital buildings. Since the potentially liquefiable soils occur in pockets and the locations and lateral extent of these pockets cannot be entirely determined, the recommended method for minimizing risk from liquefaction is to drive piles at discrete column locations to transfer the column loads into underlying non liquefiable soils. However, the SHC parking structure under the Tree Preservation Alternative, by contrast, would not need to be constructed with driven piles because the parking structure is not subject to the heightened OSHPD structural requirements that apply to hospital buildings. The mat foundation technique originally anticipated in the SUMC Project description would be used for the SHC parking structure.

SoM Site

- The Tree Preservation Alternative would also include a redesign of the FIM 1 building to save as many Protected Trees as possible in this area. The proposed building size and height would be the same as the SUMC Project; however, the footprint of the building would be altered to save Protected Trees at the northeast corner of the building. Due to the requirements of the program, and the location of the Protected Trees on the site, not all of the Protected Trees at the FIM 1 Site would be preserved with this alternative. Out of the 12 Protected Trees at the FIM 1 Site that would be removed under the SUMC Project, approximately three would be retained and two would be relocated.

LPCH Site

- The Protected oak tree that is east of the proposed LPCH hospital building, adjacent to Welch Road, would not be retained under this alternative; however, the alternative would seek to relocate this tree to another location.

Circulation Around Pasteur Road

- A new road would be created running east-west directly down the middle of Kaplan Lawn, replacing the function of two roads that exist today between the two barrels of Pasteur Drive (Blake-Wilbur Drive and the SUMC Promenade). This new road would preserve the existing Protected Tees, highlighting them as a visual amenity in order to frame the approach and arrival sequence to the new SHC facilities. This design would also allow the creation of a new arrival plaza at the pedestrian exits from Parking Structure 4, permitting a safer pedestrian entry sequence to the SHC Hospital building. In addition, it would remove a large percentage of vehicle/pedestrian/bicycle interactions along the SUMC Promenade, creating better pedestrian opportunities between the hospitals and the SoM. Kaplan Lawn would be further enhanced with additional landscaping, including the placement of two relocated trees from the FIM 1 Site.

As proposed under the SUMC Project, the Tree Preservation Alternative would require the demolition of the 1959 Hospital Building complex. In its place, the Tree Preservation Alternative would construct the replacement SHC clinic/medical office building and SoM FIM Buildings 2 and 3 in the same locations as under the SUMC Project (for the changes to FIM Building 1, see above). In addition, under the Tree Preservation Alternative, the site plans at the LPCH and the Hoover Pavilion would be the same as under the SUMC Project. Therefore, the 21 Protected Trees at the LPCH Site and the six Protected Trees at the Hoover Pavilion Site would still be removed and potentially relocated under this Alternative. As shown in Table 5-5, the Tree Preservation Alternative would have the same development program as the proposed SUMC Project. The Tree Preservation Alternative would necessitate the same Comprehensive Plan amendments, zoning changes, and annexation as the proposed SUMC Project.

Historic Preservation Alternative

The Historic Preservation Alternative would preserve all of the essential historic aspects needed to maintain the eligibility of the 1959 Hospital Building complex for listing on the California Register of Historic Resources (CRHR). This alternative would seek to avoid the SUMC Project's significant and unavoidable impact resulting from demolition of the 1959 Hospital Building complex (see Section 3.8, Cultural Resources). In addition to the retention of the 1959 Hospital Building complex itself, the Historic Preservation Alternative would preserve the historic integrity of Pasteur Drive and its landscaping, which serve as the main approach to the 1959 Hospital Building complex.

The Historic Preservation Alternative would retain the 1959 Hospital Building complex, which includes SoM buildings (Grant, Alway, Lane, and Edwards), along with the following SHC Hospital/clinic buildings: West Pavilion ("West"), East Pavilion ("East"), Boswell, and Core.[5] Unlike the SUMC Project, the Historic Preservation Alternative would not construct a new SHC clinic/medical office building in its place. However, the existing buildings at the 1959 Hospital Building complex have a low seismic rating and do not comply with structural and non-structural criteria that must be met by the 2013 and 2030 deadlines imposed by Senate Bill (SB) 1953 for retrofit or replacement of hospital facilities. Accordingly, under the Historic Preservation Alternative, these buildings would not be used as hospital buildings, as defined by the Office of Statewide Health Planning and Development (OSHPD). This alternative would necessitate the same Comprehensive Plan amendments and zoning changes as the SUMC Project, including an amendment to allow for the exceedance over the 50-foot height limit. Annexation would not be needed for this alternative.

[5] For ease of reference, the term "Core building" consists of the East Core, West Core, and Central Core portions unless otherwise noted. It does not include the 1973 Core Expansion Building.

The SoM buildings in the 1959 Hospital Building complex total approximately 414,977 square feet and the SHC buildings in the 1959 Hospital Building complex total 441,201 square feet. Together, the 1959 Hospital Building complex totals 856,178 square feet. The Historic Preservation Alternative would involve the following actions, which are reflected in Table 5-6:

- The LPCH and Hoover Pavilion Site would be constructed as proposed under the SUMC Project. The expanded LPCH clinic uses would be included in the new LPCH hospital building.
- Hospital Module Six, as proposed under the SUMC Project, would not be constructed in Kaplan Lawn. Retention of the existing layout, open spaces, and landscape features of the approach to the 1959 Hospital Building complex are integral to the preservation of the building's historic integrity. As such, the placement of Hospital Module Six, as proposed under the SUMC Project, would degrade the surroundings and result in a significant impact. Under the Historic Preservation Alternative, the program that is currently proposed for Hospital Module Six would be absorbed into the remaining portion of the SHC Hospital building footprint. The resulting SHC Hospital building square footage and height (130 feet) would be the same as under the SUMC Project. For more details about the design of the new SHC Hospital building, refer to the Tree Preservation Alternative, above, which would apply to the Historic Preservation Alternative as well.
- All SHC Hospital building site components proposed under the Tree Preservation Alternative would apply to the Historic Preservation Alternative. This includes the relocation of emergency generators to the Advanced Medicine Center; reconfiguration of the ambulance route; relocation of the emergency department entrance to Pasteur Drive; relocation of the patient drop-off loop farther down Pasteur Drive; and the accommodation of public functions along the West Elevation of the SHC Hospital building.
- All hospital functions would be moved out of the 1959 Hospital Building complex and into the new SHC Hospital building. The SHC would use its 441,201 square feet of space within the 1959 Hospital Building complex for clinic/medical office uses after physical separation from the adjacent buildings by demolishing the Core Expansion Building. This square footage nearly equals the 429,000 square feet of new and replacement SHC clinic/medical office space that is part of the SUMC Project. As such, the 429,000 square feet would not be constructed under this alternative.
- The 1959 Hospital Building complex would be physically separated from the remaining hospital buildings such that it would no longer be considered part of the hospital for purposes of compliance with OSHPD requirements. To accomplish the required physical separation, certain construction steps would need to be taken, as follows:
    - The demolition of the 1973 Core Expansion building would create a physical separation between the 1959 Hospital Building complex and the remaining hospital buildings. However, unlike under the SUMC Project, the demolition would need to be done in a manner that does not adversely affect the structural integrity of the 1959 Hospital Building complex.

Table 5-6
Historic Preservation Alternative: Demolition and Replacement (Compared to SUMC Project)[a,b,c]

Building	Use	Historic Preservation Alternative Demolition/ Replacement (square feet)	SUMC Project Demolition/Replacement (square feet)
Demolitions			
1959 Hospital Building complex	SHC Hospital	0	-133,025
1973 Core Expansion Building	SHC Hospital	-223,850	-223,850
SHC Entry	SHC Hospital	0	-77
1959 Hospital Building complex	SHC Clinic/Medical Office	0	-308,176
1101 Welch Road	SHC Clinic/Medical Office	-40,100	-40,100
701 and 703 Welch Road	Clinic/Medical Office	-79,800	-79,800
1959 Hospital Building complex (Lane, Grant, Alway, Edward)	SoM Research/Laboratory	0	-414,977
Hoover Pavilion- misc. (shops and storage)	Hoover Pavilion Shops and Storage	-13,831	-13,831
Subtotal Demolition		-357,581	-1,213,836
New Buildings[d]			
Replacement SHC Hospital	SHC Hospital	1,100,000	1,100,000
New LPCH Hospital Structure	LPCH Hospital	471,300	471,300
Replacement SHC Clinic/Medical Offices	SHC Clinic/Medical Office	0	429,000
New LPCH Clinic/Medical Offices	LPCH Clinic/Medical Office	50,000	50,000
FIM 1, 2, and 3	SoM Research/Laboratory	0	414,977
Hoover Pavilion New Medical Office	Hoover Pavilion Clinic/Medical Office	60,000	60,000
New Building Subtotal		1,681,300	2,525,277
Net Increase		**1,323,719[e]**	**1,311,441**

Sources:

a. PBS&J, Memorandum: "Preliminary List of Project Alternatives to the SUMC Facilities Replacement and Renewal and Simon-Properties Stanford Shopping Center Expansion EIR (for discussion)," October 29, 2007.

b. Alternatives reviewed by Marlene Berkoff, FAIA, Principal, Berkoff Facility Strategies.

c. Barbara Schussman, Bingham McCutchen LLP, Memorandum: "Historic Preservation Alternative," November 12, 2008.

Notes:

d. Does not include new parking garages.

e. There would be a slightly larger net increase in floor area (approximately 12,200 square feet) under the Historic Preservation Alternative than under the SUMC Project because the Historic Preservation Alternative would require less demolition.

- The required physical separation would entail a separation of utilities such that no utility lines would be allowed to run through the 1959 Hospital Building complex and connect with the 1989 Hospital Modernization Project (HMP) building and other buildings that would continue to be used for hospital functions. To accomplish this separation, utility systems would need to bypass the 1959 Hospital Building complex and enter the HMP building directly, while lines that traverse the 1959 Hospital Building complex would be capped. The 1959 Hospital Building complex would continue to be served by the existing utility systems.

- The West, East, Core, and Boswell Buildings would need to be retrofitted in order to house medical office buildings and clinics. The scope and costs of the retrofit work would depend on the type of retrofit approach chosen. One approach would involve some form of exterior lateral restraint system. Other approaches would include interior changes such as lengthening the shear walls; adding interior brace frames; thickening existing interior walls; and adding beams or beam "collectors" to transfer the loads from the walls to the foundation. Interior renovations would not affect the historic integrity of the building and therefore would be preferable to exterior renovations.[6] In addition, other retrofit activities would need to occur including: the replacement of HVAC ducts with larger ducts in order to comply with OSHPD 3 standards; significant modifications to ensure compliance with ADA requirements; the retrofit of interior walls in order to secure equipment and gas tanks; and the addition of storage space.

- SoM would use the Grant, Alway, Lane, and Edwards buildings for research purposes, as opposed to demolishing those buildings and constructing the new FIM buildings, as under the SUMC Project. The reuse of the SoM buildings would require renovation work including: the addition of stronger and more reliable fire walls; an upgrade of the HVAC duct system; the retrofit of interior walls in order to secure laboratory equipment and gas tanks; the retrofit of exterior glazing system from operable to "sealed" windows; the widening of corridors and the interior circulation areas; the addition of exterior or interior exits, stairs, and elevators to comply with current Fire Code and ADA requirements; and internal space reconfiguration to allow for integrated laboratory suites consistent with modern demands.

- The parking lots proposed under the SUMC Project that would be constructed under the Historic Preservation Alternative would include the SHC parking structure as proposed under the Tree Preservation Alternative (with three levels underground and four levels aboveground) at the corner of Welch Road and Pasteur Drive, the underground LPCH parking structure at the corner of Welch Road and Quarry Road, and the Hoover Pavilion parking structure. However, the underground parking lot proposed at the site of the new SHC clinics would have to be constructed elsewhere since it would be located under the 1959 Hospital Building complex. This parking would instead be accommodated elsewhere at the Main SUMC Site, including potentially expanding the existing Pasteur Drive garage and/or increasing the size of the proposed SHC parking structure at the Welch Road/Pasteur Drive intersection.

[6] Architectural Resources Group, Inc., Stanford Medical Center Project: ARG Project Number 07030, Memo to PBS&J, March 17, 2010.

- As with the Tree Preservation Alternative, above, a new road would be created running east-west directly down the middle of Kaplan Lawn, replacing the function of two roads that exist today between the two barrels of Pasteur Drive (Blake-Wilbur Drive and the SUMC Promenade). A plaza, bicycle and pedestrian paths, and landscaping would be included in the vicinity of Kaplan Lawn, similar to the Tree Preservation Alternative.
- Since the overall square footage of the Historic Preservation Alternative would be roughly equal to the square footage under the SUMC Project, the same new zoning would be necessary to allow increased floor area ratios, height limits, and other standards.
- The Historic Preservation Alternative would be constructed and operational by 2025.

Village Concept Alternative

According to ABAG's *A Place to Call Home: Housing in the San Francisco Bay Area*, "Increasingly, there are signs that our current development pattern – auto-dependent [housing] development in the edges of the region far from employment centers – is straining the region's resources... Putting houses closer to jobs and transit also enables workers in the Bay Area to drive fewer miles and, therefore, spend less time behind the wheel. In the Bay Area, nearly 20 percent of workers have a commute time of 45 minutes or more."[7] As demonstrated in Section 3.13, Population and Housing, approximately 8 percent of new SUMC Project employees would live in Palo Alto, and about 95 percent of new SUMC Project employees would live in the larger Bay Area region. Because the current development pattern in the region is auto-dependent, it can reasonably be assumed that a majority of those who work in the City but live outside the City would travel to work by car. The vehicle work trips result in vehicle miles traveled, increased traffic congestion, and vehicular air and noise emissions (see Sections 3.3 through 3.6 of this EIR).

The City has developed the Village Concept Alternative for the purposes of reducing the vehicle miles traveled, traffic congestion, and vehicular air and noise emissions that are associated with the SUMC Project. The Village Concept Alternative would accomplish this purpose primarily by recommending dedication of nearby housing for SUMC Project employees, and enhancing pedestrian connectivity in the Village Concept Study Area (see Figure 5-2). The Village Concept Alternative would provide opportunities to enhance the SUMC Project by creating a more walkable, bikeable, mixed-use, transit-oriented, and well-connected urban environment. The Village Concept Alternative considers comprehensively and long-term the SUMC Project and the SUMC Project's relationship to its surrounding context.

The Village Concept Alternative would include:

(1) The SUMC Project as proposed;

(2) A recommendation by the City that 490 previously approved but not yet constructed housing units along Quarry Road and Pasteur Drive, on Stanford lands, be below market rate units that

7 ABAG, *A Place to Call Home: Housing in the San Francisco Bay Area*, pp. 2 and 5, June 2007.

would be dedicated for occupancy by SUMC Project employees, and a recommendation by the City that the housing be constructed within a specified timeline. It is important to note that the Village Concept Alternative does not propose to construct the 490 housing units as those units have been separately proposed and approved for construction under the Stanford Community Plan/General Use Permit and Sand Hill Road Corridor Projects (explained further subsequently under Housing Sites); and

(3) Pedestrian linkages between the SUMC Project, the Stanford Shopping Center, Stanford University, the Palo Alto Intermodal Transit Station (PAITS), and Downtown, with corresponding urban design recommendations.

These enhancements under the Village Concept Alternative can be implemented through one or more of the following mechanisms: zoning amendments associated with the SUMC Project, conditions of approval, or through the Development Agreement conditions.

Village Concept Purpose and Objectives.[8] A key goal of the Village Concept Alternative is to ensure that the SUMC Project contributes to, and does not preclude, future opportunities to create an urban, transit-oriented village that can capture the potential travel behavior, air quality protection and greenhouse gas reduction benefits associated with the performance of well-designed urban villages. To achieve this end, the Village Concept Alternative proposes features that potentially can attain the basic objectives of the SUMC Project, lessen the environmental effects of the SUMC Project, and provide benefits of an urban village environment consistent with the values and character of the City of Palo Alto. The basic objectives of the Village Concept Alternative are as follows:

- *Urban Village*. Create a more walkable, bikeable, mixed-use, transit-oriented and well-connected urban environment that captures the potential travel behavior, air quality, and greenhouse gas reduction benefits associated with the performance of well-designed urban villages.
- *Mutual Benefits*. Support mutually beneficial economic, environmental, and social synergies between the SUMC Project and the surrounding area that can be created through proximity, accessibility and urban design.
- *Connectivity*. Create walkable and bikable connections that link together the Stanford Shopping Center, Stanford University Medical Center, Stanford University, the PAITS, Downtown Palo Alto, and nearby residential neighborhoods.
- *Auto-Independence*. Support the evolution of the existing auto-dependent environment to be a more attractive and accessible bicycle, pedestrian, and transit-oriented urban environment.
- *Public Spaces*. Create opportunities to shape visible and accessible urban public spaces and streets that are well-designed, attractive pedestrian-oriented public gathering places.

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8 Fukuji Planning & Design, Village Concept Alternative, electronic communication with the City of Palo Alto/PBS&J, February 18, 2009.

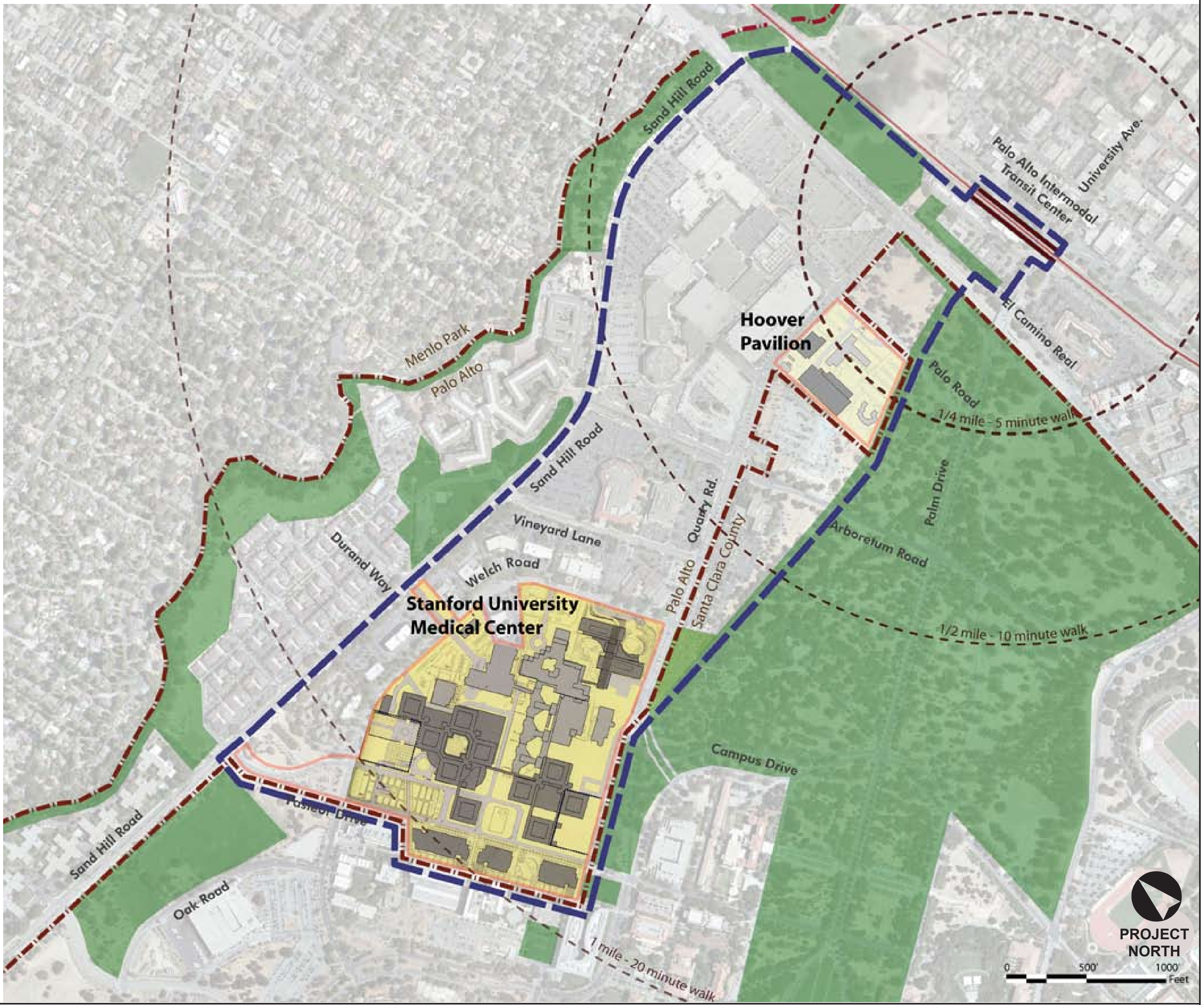
- *City Character*. Support implementation of the City's Comprehensive Plan policies related to the urban design of the Village Concept Study Area, including creating a well designed, compact city; creating attractive pedestrian scale centers; offering a variety of retail and commercial services; creating focal points and community gathering places; ensuring high quality employment districts with distinct character that contribute to the City as whole; provision of well designed buildings; and the shaping of coherent development patterns that enhance City streets and public spaces in harmony with the scale and character of Palo Alto.
- *Campus Identity*. Support Stanford University's historic campus identity as "a place apart" with a "sense of higher purpose," as well as support Stanford's commitment to innovative, high quality of design through its interpretive approach to contextual design with the design of campus buildings and the landscape.
- *Legibility*. Increase the visual legibility of the medical center and shopping center districts, and the circulation of the Village Concept Study Area, to create an overall cohesiveness, sense of identity, welcome, safety and ease of way finding from El Camino Real to the medical campus and academic campus along Quarry Road.
- *Coherent Framework*. Create a coherent and flexible urban design framework that provides guidance to the site planning of the Project, as well as identifies opportunities to shape an attractive, bicycle, pedestrian, and transit-oriented, accessible and well-connected public realm, which is flexible in accommodating innovation with new medical, research and infrastructure technologies.
- *Feasible Implementation*. Recommend urban design opportunities that can be feasibly implemented through influencing the design of the SUMC Project. Also, propose new program, programmatic or site planning considerations for either incorporation in the SUMC Project as an alternative in the EIR as mitigations, performance measures, or for future consideration in the long-term planning and development of the Village Concept Study Area.

Description of Village Concept Alternative. The Village Concept Study Area defines the focus area for consideration of urban design principles that can shape a village concept and link the SUMC Project and the surrounding context together. As shown in Figure 5-2, this Study Area includes the PAITS as its focal point around which transit oriented development would occur within a five-minute, ten-minute, and 20-minute walking distance. The Study Area comprises a portion of this area wherein TOD could occur. The Village Concept Study Area is bounded by the Caltrain right-of-way to the east, the Arboretum to the south, Stanford University to the west, and Sand Hill Road to the north.[9] The Study Area includes the SUMC Project as proposed and the area contained within the Stanford University Medical Center Area Plan.

[9] As stated in the Section 2, Project Description, true northwest is considered project north for the purposes of this analysis; as such, Sand Hill Road runs along the northern boundary of the Project Area, El Camino Real runs along the east, and the Stanford University campus occurs to the south and west.

Village Concept Study Area

Stanford University Medical Center Projects



Source: Fukuji Planning & Design, October 2009.

PBS&J

FIGURE 5-2

Village Concept - Study Area

D41357.00

Stanford University Medical Center Facilities Renewal and Replacement Project

Housing Sites. As shown in Figure 5-3, three housing sites are within the Village Concept Study Area. Two sites are in Santa Clara County: the Quarry Road/Arboretum Drive and Quarry Road/El Camino Real sites. The Pasteur Drive/Sand Hill Road site is within the City of Palo Alto. The following describes the three housing sites under the Village Concept Alternative, as shown in Table 5-7:

- **Quarry Road/Arboretum Drive Site.** A total of 240 units on the Quarry Road/Arboretum Drive site have undergone environmental review under CEQA and have been approved for development (see Previous Analysis of Housing Sites, later in this section). Under the Village Concept Alternative, the City would recommend that Stanford University dedicate this housing to SUMC Project employees, as below-market rate units, and construct the housing within four years of the first building permit for the SUMC Project.

  This site consists of eight acres and is located on the southeastern corner of Quarry Road and Arboretum Road. Across Quarry Road to the north is the Stanford Shopping Center, and the Hoover Pavilion Site is adjacent to the east. A commercial bank is located at the northwest corner of the site. Currently, this site is used as the Hoover Pavilion South lot.

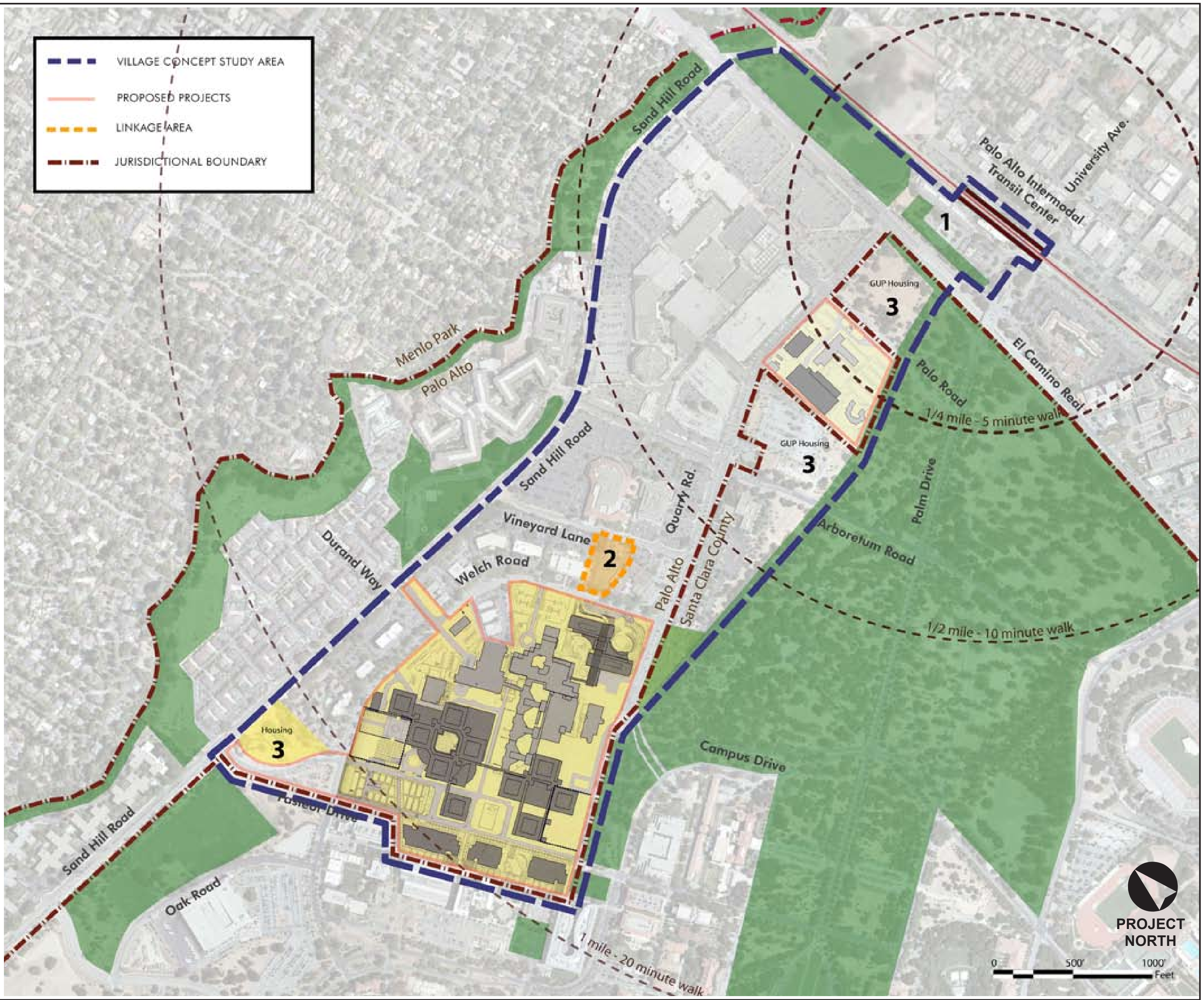
  The Quarry Road/Arboretum Drive site is zoned as A1-20S, Academic Reserve and Open Space, per the approved Stanford Community Plan/General Use Permit. Zone A1-20S is defined as lands outside of the core campus area that currently have an open space character or use, or low intensity academic use. These lands are identified as important for their scenic beauty, visual relief, grazing, and wildlife values, as well as their academic potential. The 20S refers to the 20S Slope-Density Combining District, which regulates density of development through provisions that determine the maximum number of lots and dwelling units permitted through subdivision based on the average slope of the lot.[10] This site is within unincorporated Santa Clara County, and any changes to the previously approved housing therein would require County approval.

- **Quarry Road/El Camino Real Site.** A total of 180 units on the Quarry Road/El Camino Real site have undergone environmental review under CEQA and have been approved for development (see Previous Analysis of Housing Sites, later in this section). Under the Village Concept Alternative, the City would recommend that Stanford University dedicate this housing to SUMC Project employees, as below-market rate units, and construct the housing within two years of the first building permit for the SUMC Project.

  This site consists of approximately 6.2 acres and is located on the southwestern corner of Quarry Road and El Camino Real. Across from Quarry Road to the north is the Stanford Shopping Center, and across from Palo Road to the west is the Hoover Pavilion Site. Currently, this site is open space and no buildings are located on the property.

[10] County of Santa Clara, *Stanford University Draft Community Plan and General Use Permit Application, Final Environmental Impact Report*, Certified by the Santa Clara County Board of Supervisors, December 2000.

1. Transit-Oriented Development
2. Stanford Barn Area
3. Housing Sites



Source: Fukuji Planning & Design, October 2009.

FIGURE 5-3
Village Concept - Land Use

D41357.00

Stanford University Medical Center Facilities Renewal and Replacement Project

Table 5-7
Village Concept Alternative (Compared to the SUMC Project)

Building	SUMC Project	Village Concept Alternative (sf)
Development Being Considered[b]		
SUMC Sites	2,525,277 sf	2,525,277 sf
Quarry Road/Arboretum Drive Site	n/a	240 units
Pasteur Drive/Sand Hill Road Site	n/a	180 units
Pasteur Drive/Sand Hill Road Site	n/a	70 units

Source: PBS&J, 2010.

Notes:

a. Does not include parking garages.

b. Does not include existing square footage.

The Quarry Road/El Camino Real site is also zoned as A1-20S, Academic Reserve and Open Space, per the approved Stanford Community Plan/General Use Permit.[11]

- **Pasteur Drive/Sand Hill Road Site.** A total of 70 units on the Pasteur Drive/Sand Hill Road site have undergone environmental review under CEQA (see Previous Analysis of Housing Sites, later in this section). Under the Village Concept Alternative, the City would recommend that Stanford University dedicate this housing to SUMC Project employees, as below-market rate units, and construct the housing within four years of the first building permit for the SUMC Project.

  This site consists of 2.5 acres and is located on the southeast corner of Pasteur Drive and Sand Hill Road. The site is just north of the Main SUMC Site, and Sand Hill Fields is located across Pasteur Drive, to the east of the site. Currently, this site is open space and no buildings are located on the property. This site is within City of Palo Alto jurisdiction and is zoned PF, Public Facilities. A zone change to RM-40,[12] which allows multiple-family residential units at a maximum residential density of 40 dwelling units/acre[13] would be required for this site.

Previous Analysis of the Housing Sites. It is important to note that all 490 units have been analyzed under previous CEQA documentation. There are two certified Environmental Impact Reports (EIRs) that cover the three proposed housing sites: the Stanford Community Plan/General Use Permit (CP/GUP) EIR[14] and the Sand Hill Road Corridor Projects (Sand Hill Road) EIR.[15] These previous

11 County of Santa Clara, *Stanford University Draft Community Plan and General Use Permit Application, Final Environmental Impact Report*, Certified by the Santa Clara County Board of Supervisors, December 2000.

12 City of Palo Alto, Zone Map Page 04, 2006.

13 City of Palo Alto, *Zoning Regulations of the City of Palo Alto*, Title 18 of the Palo Alto Municipal Code, Section 18.13.010(c), October 11, 2007.

14 County of Santa Clara, *Stanford University Draft Community Plan and General Use Permit Application, Final Environmental Impact Report*, certified by the Santa Clara County Board of Supervisors, December 2000.

15 City of Palo Alto, *Sand Hill Road Corridor Projects Final Environmental Impact Report*, certified by the City of Palo Alto, July 1998.

EIRs disclosed the environmental impacts of the broader development contemplated under the Stanford CP/GUP and the Sand Hill Road Corridor Projects. The impacts specifically from developing the three sites with housing are captured within the previous EIRs. Following is a further description of the two previous EIRs:

- *Stanford Community Plan/General Use Permit EIR.* The Stanford CP/GUP EIR was certified by the County of Santa Clara in December 2000. The Community Plan (CP) element of the document was established to implement policies and land use designations that would guide the County in its approval process for development of Stanford University lands. Specific entitlements to use Stanford land for housing or academic facilities, conditions for such use, and the process for obtaining specific project approvals was outlined in the General Use Permit (GUP). Development analyzed in the GUP included new academic facilities, expanded parking, utilities, access roads, bikeways, landscaping, and other requisite infrastructure on Stanford lands within the County of Santa Clara. Also included in the GUP was an analysis of 2,655 to 3,022 housing units on Stanford lands and the environmental impacts associated with constructing these units. Two of the sites that were analyzed in the GUP EIR were the Quarry Road/Arboretum Drive site, for 200 units, and the Quarry Road/El Camino Real site, for 150 units. These two sites were approved in December 2000[16] to provide a total of 420 units (350 units plus a 20 percent overage of 70 units[17]) for postgraduates and/or hospital residents.
- *Sand Hill Road Corridor Projects EIR.* The Sand Hill Road EIR was certified by the City of Palo Alto in July 1998. The Sand Hill Road Corridor Projects included five different projects along Sand Hill Road: the proposed Stanford West Apartments; the Stanford West Senior Housing Complex; the expansion of the Stanford Shopping Center; a set of changes to the roadway system that serve the vicinity; and a series of annexations to the City of Palo Alto. One annexation analyzed in the document included the Pasteur Drive/Sand Hill Road parcel and the EIR assumed that this site would be able to support 70 housing units. As such, the Sand Hill Road EIR addressed the environmental impacts resulting from the construction of the 70 housing units at this site.

Applicability of the Previous EIRs to the Village Concept Alternative. Housing at the three sites have undergone CEQA review and have been approved by their respective lead agencies. The housing as approved could thus be constructed currently under the previous analysis and approval. On the basis that the housing at the three sites have been environmentally cleared, this analysis does not provide a further analysis of the housing sites. However, as stated earlier, under the Village Concept Alternative, the housing would be constructed under recommended modifications to the terms as previously approved. As such, the analysis in the previous EIRs address impacts from the housing, except for areas where the recommended modifications to the housing terms would change the previously identified impacts. While modifications to the housing terms at the two Quarry Road sites would be subject to County review and approval, this analysis does consider the changes to the

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16 County of Santa Clara, Stanford University 2000 General Use Permit, "Conditions of Approval," approved December 12, 2000.

17 This number includes the allocation contained in Section F.1 of the GUP plus 20 percent as permitted in Section F.4.b.

previously identified impacts of housing due to the recommended terms. The recommended terms under which the housing would be constructed are provided below.

- *Dedication of housing occupancy to SUMC Project employees.* The new rental housing units constructed at the three sites under the Village Concept Alternative would be developed by Stanford University. As discussed above, the City would recommend that housing be prioritized for SUMC Project employees, as below-market rate units. The CP/GUP contemplates that the housing at both Quarry Road sites would be dedicated to post-doctoral fellows and graduate students, and the City would recommend that those housing sites be instead dedicated to SUMC Project employees. It is not expected that dedication of housing to SUMC employees would displace post-doctoral fellows and graduate students off campus because the CP/GUP allows for construction of 20 percent more homes than the projected need at the campus. The 420 units at the Quarry Road sites would be within the 20 percent additional allowance.

- *Accelerated timeline.* The Stanford CP and GUP are intended to govern development and use on Stanford University lands for at least ten years, beginning in 2000. However, the documents do not provide a specific timeline as to when the Quarry Road/Arboretum Road and Quarry Road/El Camino Real sites would be developed.[18] In addition, the Sand Hill Road EIR only included the annexation of the Pasteur Drive/Sand Hill Road parcel for potential future development and did not include specific plans for the site. Therefore, no construction timeline was provided for housing on this site.[19]

  Under the Village Concept Alternative, the City would recommend that the SUMC Project sponsors construct the Quarry Road/El Camino Real housing site within two years of the first building permit for the SUMC Project. The City would recommend that remaining housing sites be constructed within four years of the first building permit for the SUMC Project.[20]

The above recommendations, if implemented, would have some implications on the analysis in the Stanford CP/GUP EIR, certified in 2000. Specifically, the CP/GUP EIR transportation analysis applied trip generation rates specific to campus residents, including trip rates for graduate students and post doctoral fellows.[21] The trip rate of SUMC employee occupants of the housing would differ from the trip rate for graduate students and post doctoral fellows. The change in the trip rate and trip generation from the 420 Quarry Road housing units is addressed in this analysis. The corresponding vehicle miles traveled (VMT), and air quality and noise emissions are also captured. Because the density and location of the housing units on the Quarry Road sites remain the same as contemplated

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18 County of Santa Clara, *Stanford University Draft Community Plan and General Use Permit Application, Final Environmental Impact Report*, certified by the Santa Clara County Board of Supervisors, December 2000.

19 City of Palo Alto, *Sand Hill Road Corridor Projects Final Environmental Impact Report*, certified by the City of Palo Alto, July 1998.

20 Steven Turner, City of Palo Alto, electronic communication with PBS&J, February 18, 2009.

21 County of Santa Clara, *Stanford University Draft Community Plan and General Use Permit Application, Final Environmental Impact Report*, Section 4.4.E.3, Future Trip Generation with General Use Permit, certified by the Santa Clara County Board of Supervisors, December 2000.

under the Stanford CP/GUP EIR, implementation of recommendations under the Village Concept Alternative would not have repercussions on the Stanford CP/GUP EIR conclusions regarding land use, visual quality, cultural resources, biological resources, geology, hydrology, hazardous materials, public services, and utilities.

The above recommendations, if implemented, would have no implications on the conclusions in the Sand Hill Road EIR because that analysis did not include assumptions on the type of residential occupants of the 70 housing units on the Pasteur Drive/Sand Hill Road site. Additionally, the density and location of the housing units on the Pasteur Drive/Sand Hill Road site remain the same as contemplated under the Sand Hill Road EIR.

Pedestrian Linkages and Village Environment.[22] The following descriptions of public spaces, connectivity, and urban design recommendations would either modify or add to the SUMC Project. In the descriptions below, the term "new" refers to new design elements that are not part of the SUMC Project that, if implemented, could result in a measurable change in the physical environment and associated environmental effects. Figures 5-4 and 5-5 show the sequence of public spaces and connections.

- New Class I shared-use bicycle and pedestrian path extending from the planned Everett under-crossing at Caltrain to El Camino Real:
  - New impervious surface with a cross section of 10 to 12 feet wide per the American Association of State Highway and Transportation Officials (AASHTO) pedestrian density guidelines, with 2- to 4-foot-wide shoulder for pedestrians to step-off the path for fast moving bikes; this is mostly new impervious surface;
  - New pedestrian scaled lighting; and
  - New directional signage.
- New Intersection at El Camino Real and Quarry Road improvements:
  - New 12-foot-wide ladder stripe crosswalk markings (this can also apply to all intersections identified for pedestrian-oriented design features);
  - Consider new bike lane route markings through the intersection as painted, blue pavement coloring with white dashed lines for west bound bicyclists crossing El Camino Real, and eastbound left turns from Quarry Road to northbound El Camino Real to increase bicycle safety. Colored bike lanes would require Caltrans approval;
  - Evaluate of adequacy of bicycle and pedestrian signal crossing times, and if deficient (greater than 4 feet per second crossing speed), increase time (decrease walking speed to 3.5 to 4 feet per second) and evaluate impact on peak hour intersection LOS and vehicle delay;

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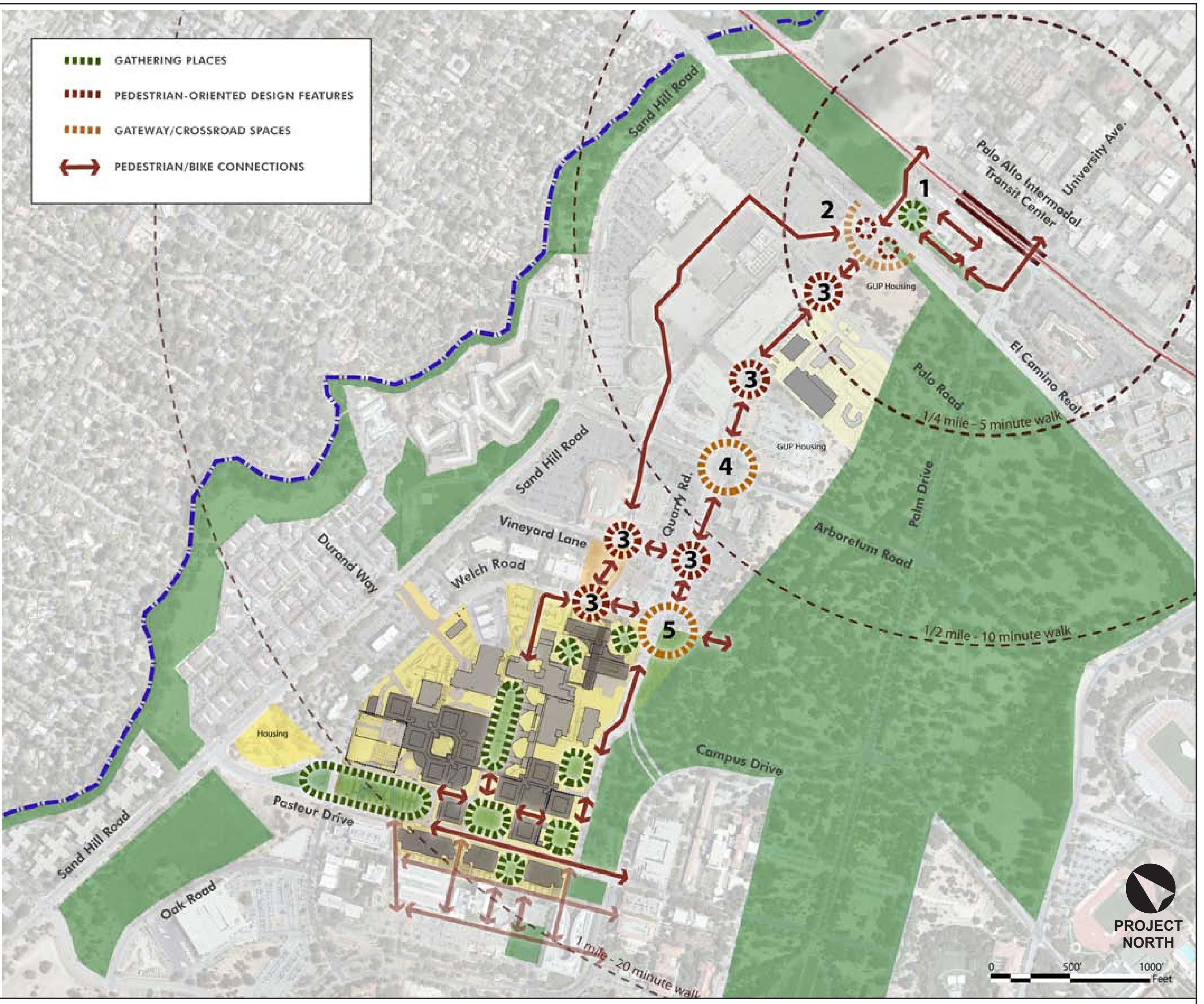
22 Fukuji Planning & Design, "Village Concept EIR Analysis Design Elements Needing Additional Analysis From 10/7/09 meeting with Stanford and City Staff," memo from October 20, 2009.

1. El Camino Park/Caltrain Station access improvements and public gathering space
2. Gateway to Quarry Road District
3. Pedestrian-Oriented Design Features
4. Quarry Road and Arboretum Crossroads
5. Campus Gateway



Source: Fukuji Planning & Design, October 2009.

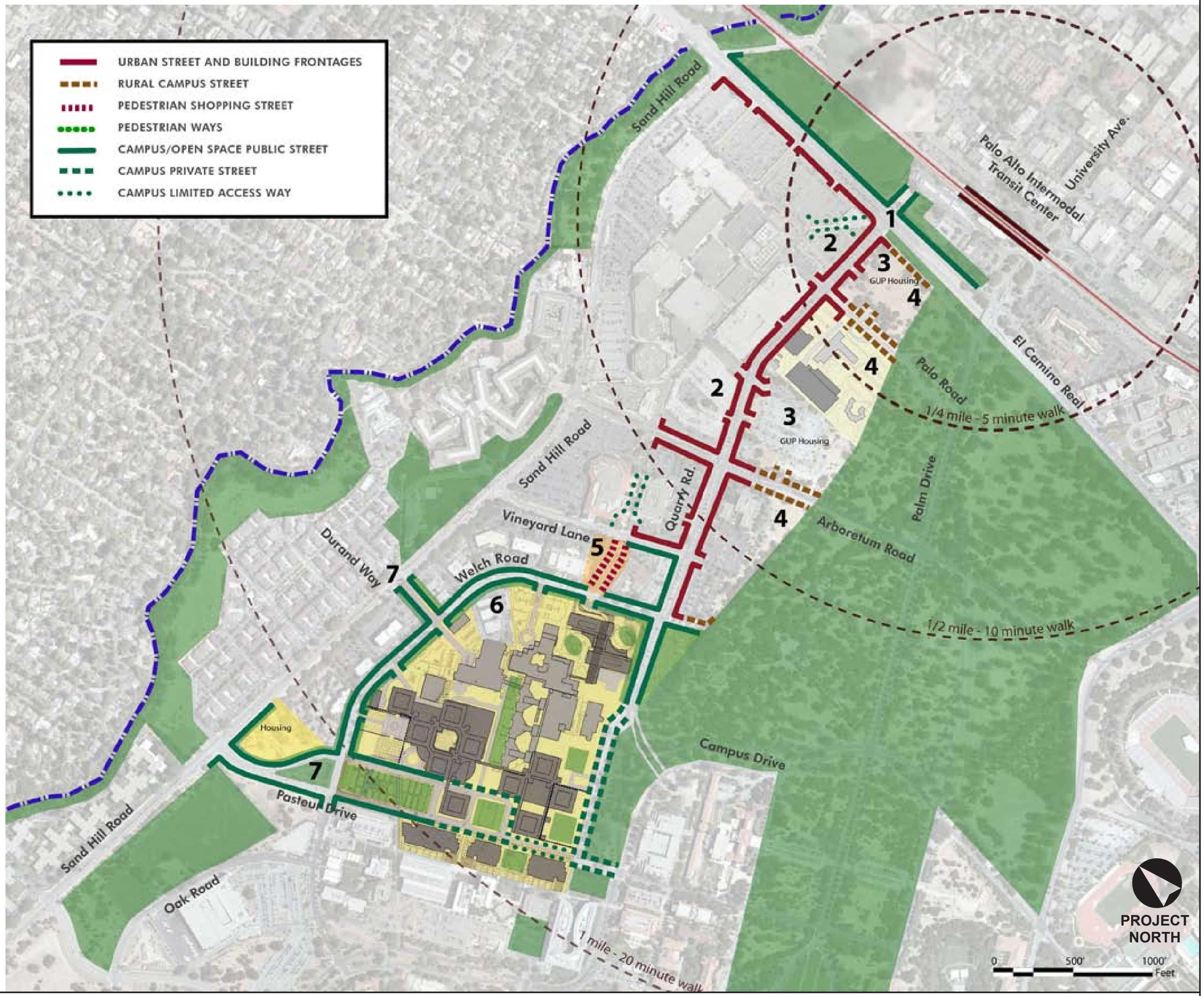
PBS&J

FIGURE 5-4
Village Concept - Public Space

D41357.00

Stanford University Medical Center Facilities Renewal and Replacement Project

1. EL Camino Real Grand Boulevard bike lanes and intersection improvements at Quarry Road
2. Quarry Road as urban, tree-lined arterial street
3. Quarry Road housing designed as walkable, residential neighborhoods with urban street and block pattern; residential entries with direct pedestrian access to face Quarry Road
4. Maintain Arboretum's rural character with landscape setbacks and design features along El Camino Real, Palo Road and Arboretum Road; residential entrances with pedestrian access facing the Arboretum
5. Stanford Barn area connection as potential pedestrian-oriented shopping street
6. Welch Road as walkable, bikable tree-lined street with landscape setback for medical campus uses to the south
7. Durand Way and Pasteur Drive as landscaped campus entrances



Source: Fukuji Planning & Design, October 2009.

PBS&J

FIGURE 5-5
Village Concept - Urban Design

D41357.00

- New paving to connect Class I shared use path and other pedestrian paths to the east side of the El Camino Real and Quarry Road pedestrian crossing;
- Add new ADA accessible median pedestrian refuge; and
- Consider new bicycle and pedestrian actuated signal crossings for off-peak hour crossings.

- New Stanford Barn area ADA accessible pedestrian crossings at:
  - Vineyard Road (see the description regarding Arboretum and Palo Road, above); and
  - Welch Road (It should be noted that this crossing is already proposed as part of the SUMC Project; see Section 2, Project Description.)
- "Transit Centers." As proposed by the SUMC Project sponsors, design features and capacity needs for shuttles include:
  - Typical shuttle stop is 40 feet red curbside pick-up and drop-off, for Hoover Pavilion and new hospital, two shuttles would need 100 feet of red curbside pick-up;
  - At new hospital, cantilevered canopy to provide overhead covering for riders or bus shelters with covered seating; and
  - Signage at each stop.

5.3 ALTERNATIVE CONSIDERED BUT REJECTED

An off-site alternative considered for this analysis but rejected from further review because it would be infeasible, would not attain most of the basic SUMC Project objectives, and would not sufficiently reduce SUMC Project impacts. Factors that may be considered when a Lead Agency is assessing the feasibility of an alternative include: "site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site (or the site is already owned by the proponent)."[23]

SUMC Off-Site Location Alternative

The CEQA Guidelines state that an EIR must consider off-site alternatives if such alternatives are deemed to be feasible by the Lead Agency.[24] The SUMC Project components are designed to function together with adjacent hospital and School of Medicine buildings at the SUMC Sites and on the Stanford campus. Construction of the SUMC Project components elsewhere would be infeasible because the components are not designed to stand alone. If the project components were re-designed such that they did not depend upon the adjacent SUMC buildings, then a larger project would be

[23] CEQA Guidelines, Section 15126.6(f)(1).
[24] CEQA Guidelines, Section 15126.6(f)(2).

needed because facilities that otherwise would be retained at the SUMC would need to be replaced at the alternative site. This most likely would not result in a reduction of environmental impacts. Rather, replacing and expanding the existing hospitals within the SUMC Site minimizes waste, construction-related effects, and impacts pertaining to siting such as adverse effects on biological resources.

Locating the SHC, LPCH, and SoM buildings away from the Stanford University campus also would hinder the Hospitals' ability to maintain their position as leading providers of complex care and to deliver high quality health care services and related teaching and research. SHC employees who do not need to be at SUMC have moved to other locations, such as Redwood City and Stanford Research Park. The Hospitals' proximity to the Stanford campus provides opportunities for researchers in multiple disciplines to work closely with healthcare providers in order to develop new approaches to diagnosing and treating illnesses and injuries. Similarly, SoM's proximity to the Hospitals, the rest of its buildings on the Stanford campus, and the other departments on the Stanford campus enables it to translate medical research discoveries into treatments and cures. (An example is the Clark Center multi-disciplinary building, where SoM researches work with Stanford engineers.) As such, an alternative site would not achieve most of the basic objectives of the SUMC Project.

Further, within the City, there are no alternative sites in the area surrounding the SUMC Sites that could accommodate the development intensity proposed under the SUMC Project given the City's existing land use designations and zoning. In addition, the hospitals require intensive utility and transportation infrastructure, which would be difficult to relocate or establish at a new site. Therefore, this EIR does not analyze an off-site location alternative for the SUMC Project.

5.4 ATTAINMENT OF PROJECT OBJECTIVES

An evaluation of how each alternative meets or does not meet basic SUMC Project objectives (of both the SUMC Project sponsors and the City) is provided below. Pursuant to CEQA Guidelines Section 15126.6, this analysis compares the alternatives to the objectives of the SUMC Project, rather than the City's policy guidance identified in the SUMC Area Plan.

As described in detail above, there are seven alternatives for the SUMC Project: No Project Alternative A, No Project Alternative B, Reduced Intensity Alternative A, Reduced Intensity Alternative B, the Tree Preservation Alternative, the Historic Preservation Alternative, and the Village Concept Alternative. The following analysis describes the extent to which these alternatives meet or do not meet the SUMC Project objectives as described in Section 2.

No Project Alternative A: Retrofitting Only/No New Structures[25]

Project Sponsors Objectives. No Project Alternative A is not satisfactory at achieving the basic SUMC Project objectives. In the near term, both hospitals would continue to be overcrowded, and both would have to continue to turn away patients in need of services. The hospitals' ability to achieve their objectives of delivering high quality health care and services to their patients, and of maintaining their positions as leading providers of complex care, would thus be diminished. Further, under this alternative, neither hospital would be able to meet existing and projected demand for patient care, and neither hospital would provide modern, state-of-the-art facilities. Some regional needs for emergency and disaster preparedness would be met through maintenance of one of the two hospitals, but the ability to satisfy those needs would be impaired. Under this alternative there would be severely limited ability to enhance the sustainability of the hospitals' operational systems, water systems, and use of physical materials. The hospital facilities would be less able to adapt to changes in healthcare needs, changes in technology, and changes in delivery practices, becoming more outdated and functionally obsolescent even in the short term. In 2030, one of the hospitals would have to close, in order to vacate inpatient space in the non-code-compliant portions of the 1959 structures.

In addition, the existing School of Medicine research facilities would continue to become more and more outdated. Use of the facilities would not optimize the School of Medicine's ability to translate medical research discoveries into treatments and cures. Further, if one of the hospitals were to close, the School's core educational and research missions would be impaired. As with the hospitals, there also would be no ability to enhance the sustainability of the School's operational systems, water systems, and use of physical materials. The SoM facilities would not be able to adapt to changes in medical research needs and changes in technology.

City Objectives. No Project Alternative A would also not attain the primary City objectives. The existing hospitals would continue to operate at current capacity and would not be able to meet regional needs for emergency and disaster preparedness. This alternative would not assist the Stanford University Medical Center in responding to changes in the delivery of healthcare services by promoting additional development at the SUMC Sites. In addition, since only the retrofit of existing building would be completed under No Project Alternative A, no new open spaces and bicycle and pedestrian connections to and from surrounding areas would be incorporated into the SUMC Sites. As such, existing traffic problems surrounding the SUMC Sites would continue and an urban environment promoting sustainable modes of transportation would not be created. However, since minor construction would occur (retrofitting only), No Project Alternative A would have minimal environmental, financial, and municipal infrastructure impacts on the City, which would meet this particular City objective. Nonetheless, this alternative would not be able to attain the primary City objectives.

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[25] Barbara Schussman, Bingham McCutchen LLP, Memorandum: SUMC Project Alternatives to be Evaluated in EIR, January 8, 2008 (revised September 29, 2008). Memo reviewed and confirmed by Marlene Berkoff, FAIA, Principal, Berkoff Facility Strategies.

No Project Alternative B: Replace SB 1953 Noncompliant Structures at Maximum Allowable FAR[26]

Project Sponsors Objectives. Under No Project Alternative B, either LPCH would continue to be overcrowded, or LPCH's programs would shrink, providing fewer than its current number of beds and requiring it to turn away even more patients in need of its services than it does today. Both circumstances would diminish LPCH's ability to achieve its objectives of delivering high quality health care and services to its patients, providing modern state-of-the-art facilities, and maintaining its position as a leading provider of complex care.

SHC's programs also would shrink and would provide fewer services than it does today. In both hospitals, there would be substantially fewer beds than there are currently. This could endanger the critical mass of patients needed for accredited medical school teaching programs, and could also lead to a migration of patients to other hospitals (potentially with lower standards of care and at greater distances) if they are being regularly turned away for lack of beds. This consequence would undermine the purpose of having a top-quality university hospital associated with an elite medical research university. As such, the SHC would not be able to meet existing and projected future demands for health care, and would not be able to achieve its objectives of delivering high quality health care and services to its patients, and of maintaining its position as a leading provider of complex care.

Some regional needs for emergency and disaster preparedness would be met through maintenance of the two hospitals in the short term, but the ability to satisfy those needs would be impaired. Relationships with community physicians at both hospitals may be maintained; but due to likely shrinkage of hospitals' services and capacity, community physicians practicing at SHC and LPCH would be adversely affected and they would likely begin sending patients elsewhere. There would be limited ability to enhance the sustainability of the hospitals' operational systems, water systems, and use of physical materials. The LPCH facilities would be less able to adapt to changes in healthcare needs, changes in technology, and changes in delivery practices.

In addition, as with the No Project Alternative A, the existing research facilities at SoM would continue to become more and more outdated. Use of the facilities would not optimize the School of Medicine's ability to translate medical research discoveries into treatments and cures. There also would be no ability to enhance the sustainability of the School's operational systems, water systems, and use of physical materials. The SoM facilities would not be able to adapt to changes in medical research needs and changes in technology. Due to these circumstances, No Project Alternative B would not meet the majority of the SUMC Project objectives.

City Objectives. No Project Alternative B would also not attain the primary City objectives. Although new SHC and LPCH hospitals would be constructed and expanded slightly to the maximum FAR, the hospitals would continue to operate at or below current capacity (if right-sizing occurred) and

[26] Barbara Schussman, Bingham McCutchen LLP, Memorandum: SUMC Project Alternatives to be Evaluated in EIR, January 8, 2008 (revised September 29, 2008). Memo reviewed and confirmed by Marlene Berkoff, FAIA, Principal, Berkoff Facility Strategies.

would not be able to meet long-term regional needs for emergency and disaster preparedness. This alternative would not assist the Stanford University Medical Center in responding to changes in the delivery of healthcare services by promoting additional development at the SUMC Sites. This alternative would promote limited development at the SUMC Sites and would not incorporate a high quality employment district, state-of-the-art design principals, urban planning, and sustainable development to the fullest extent possible. In addition, No Project Alternative B would most likely include limited new open spaces, bicycle and pedestrian connections, and urban-village components. As such, existing traffic problems in the area surrouding the SUMC Sites would continue and an urban environment promoting sustainable modes of transportation would not be created. However, since less construction would occur under No Project Alternative B, this alternative would have fewer environmental, financial, and municipal infrastructure impacts on the City than the SUMC Project, as explained in more detail in the Impact Assessment, Section 5.5. Nonetheless, No Project Alternative B would not attain the basic City objectives.

Reduced Intensity Alternative A: Right-Size SHC and LPCH Facilities without Adding Beds[27]

Project Sponsors Objectives. Under this alternative, LPCH and SHC would not be able to accommodate existing and projected demand. Both hospitals would continue to turn away patients. Further, if the cost of providing right-sized space cannot be spread over a project that also includes expansion opportunities, it is possible that one or both hospitals would not move forward with right-sizing. This would further limit the hospitals' ability to optimize delivery of healthcare and services to patients. By limiting growth and the ability to add new programs or expand programs, each hospital's ability to maintain its position as a leading provider of complex care would be compromised. In addition, some regional needs for emergency and disaster preparedness would be met through maintenance of SHC and LPCH, but the ability to satisfy those needs through use of expansion space would be hindered.

If the existing School of Medicine buildings were replaced, this alternative would achieve the objective of replacing outmoded research facilities with state-of-the-art research facilities to support contemporary translational research. The alternative also would provide sufficient faculty offices, research laboratories, and administrative support space to meet SoM's projected needs, and the alternative would maintain the opportunity to provide responsible and sustainable design for the SoM's operating systems, water systems, and use of physical materials. In addition, the alternative could allow sufficient design and entitlement flexibility to be able to adapt to changes in medical research needs and changes in technology.

On the other hand, the alternative would not optimize SoM's ability to translate medical research discoveries into treatments and cures. Without growth in facilities at SHC and LPCH, opportunities to add new programs to the hospitals would be limited, which in turn would limit the opportunities for the School to perform and apply its research and teaching functions. Further, if the inability to grow

[27] Barbara Schussman, Bingham McCutchen LLP, Memorandum: SUMC Project Alternatives to be Evaluated in EIR, January 8, 2008 (revised September 29, 2008). Memo reviewed and confirmed by Marlene Berkoff, FAIA, Principal, Berkoff Facility Strategies.

causes the hospitals to lose their status as leading providers of complex care, the SoM's reputation and ability to attract top scholars and physicians may suffer as well. As such, Reduced Intensity Alternative A would meet some, but not all, of the SUMC Project objectives.

City Objectives. As with the SUMC Project sponsors objectives, Reduced Intensity Alternative A would attain some, but not all, of the City objectives. Although new SHC and LPCH hospitals would be constructed, the hospitals would continue to operate at existing capacity and would not be able to meet long-term regional needs for emergency and disaster preparedness. The new hospitals would employ state-of-the-art technology and sustainable features; however, since development would be significantly less than the SUMC Project, the incorporation of high quality employment districts, state-of-the-art design principals, urban planning, and sustainable development would be limited. In addition, Reduced Intensity Alternative A would most likely include limited urban-village components, resulting in continued existing traffic problems in the area surrounding the SUMC Sites. However, similar to the SUMC Project, new open spaces and bicycle and pedestrian connections would likely be created, which would serve to promote sustainable modes of transportation. In addition, since less development would occur under Reduced Intensity Alternative A, this alternative would have fewer environmental, financial, and municipal infrastructure impacts on the City than the SUMC Project, as explained in more detail in the Impact Assessment, Section 5.5. Nonetheless, Reduced Intensity Alternative A would not attain the basic City objectives.

Reduced Intensity Alternative B: Right-Size SHC and LPCH Facilities Plus Add Floor Area in an Amount Less Than the SUMC Project[28]

Project Sponsors Objectives. By limiting growth and the corresponding opportunities to add new programs or expand programs, each hospital's ability to maintain its position as a leading provider of complex care would be compromised. Under Reduced Intensity Alternative B, SHC and LPCH would not provide sufficient beds and other facilities to meet projected future growth in demand. In the long-term, the hospitals would need to turn away patients in need of their services. Some regional needs for emergency and disaster preparedness would be met through maintenance of SHC and LPCH, but the ability to satisfy those needs through use of expansion space would be limited in the long term. In addition, the medical office building at Hoover Pavilion site to accommodate community physicians would not be built under this alternative.

If the existing SoM buildings were replaced, this alternative would achieve the objective of replacing outmoded research facilities with state-of-the-art research facilities to support contemporary translational research. The alternative also would provide sufficient faculty offices, research laboratories, and administrative support space to meet the SoM's projected needs, and the alternative would maintain the opportunity to provide responsible and sustainable design for the SoM's operating systems, water systems, and use of physical materials. In addition, the alternative could allow

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[28] Barbara Schussman, Bingham McCutchen LLP, Memorandum: SUMC Project Alternatives to be Evaluated in EIR, January 8, 2008 (revised September 29, 2008). Memo reviewed and confirmed by Marlene Berkoff, FAIA, Principal, Berkoff Facility Strategies.

sufficient design and entitlement flexibility to be able to adapt to changes in medical research needs and changes in technology.

On the other hand, the alternative would not optimize the School of Medicine's ability to translate medical research discoveries into treatments and cures. If growth in facilities at SHC and LPCH were limited, corresponding opportunities to add new programs to the hospitals would be limited, which in turn would limit the opportunities for the School to perform and apply its research and teaching functions. Further, if the inability to grow causes the hospitals to lose their status as leading providers of complex care, the School of Medicine's reputation and ability to attract top scholars may suffer. As such, Reduced Intensity Alternative B would meet some short-term objectives, but overall would not meet all of the objectives of the SUMC Project.

City Objectives. As with the Project sponsors objectives, Reduced Intensity Alternative B would attain many short-term objectives, but would fall short in the long-term. Although new SHC and LPCH hospitals would be constructed, and the hospitals would operate at a slightly increase capacity over existing conditions, the hospitals would not be able to meet long-term regional needs for emergency and disaster preparedness. The new hospitals would employ state-of-the-art technology and sustainable features; however, since development would be less than the SUMC Project, the incorporation of high quality employment districts, state-of-the-art design principals, urban planning, and sustainable development would be limited. In addition, Reduced Intensity Alternative B would most likely include limited urban-village components, resulting in continued existing traffic problems in the area surrounding the SUMC Sites. However, similar to the SUMC Project, new open spaces and bicycle and pedestrian connections would likely be created, which would serve to promote sustainable modes of transportation. In addition, since less development would occur under Reduced Intensity Alternative B, this alternative would have fewer environmental, financial, and municipal infrastructure impacts on the City than the SUMC Project, as explained in more detail in the Impact Assessment, Section 5.5. Nonetheless, Reduced Intensity Alternative B would not attain the basic City objectives.

Tree Preservation Alternative

Project Sponsors Objectives. The Tree Preservation Alternative would meet all of the objectives outlined by the SUMC Project sponsors. Development of the Tree Preservation Alternative would construct new hospital and medical office buildings, allowing each hospital to maintain its position as a leading provider of complex care. Under this alternative, SHC and LPCH would provide sufficient beds and other facilities to meet projected future growth in demand. All regional needs for emergency and disaster preparedness would be met through maintenance of SHC and LPCH.

In addition, the existing SoM buildings would be replaced by the new FIM buildings; therefore, this alternative would achieve the objective of replacing outmoded research facilities with state-of-the-art research facilities to support contemporary translational research. The Tree Preservation Alternative also would provide sufficient faculty offices, research laboratories, and administrative support space to meet the SoM's projected needs would maintain the opportunity to provide responsible and sustainable design for the SoM's operating systems, water systems, and use of physical materials. In addition, the alternative could allow sufficient design and entitlement flexibility to be able to adapt to changes in medical research needs and changes in technology. As such, the Tree Preservation Alternative would attain all of the SUMC Project sponsors objectives.

City Objectives. The Tree Preservation Alternative would attain the same amount of City objectives as the SUMC Project. The new SHC and LPCH hospitals would be constructed to full build-out potential; therefore, the hospitals would be able to meet long-term regional needs for emergency and disaster preparedness. The new hospitals would employ state-of-the-art technology and design principals, urban planning, and sustainable development and would create high quality employment districts. Similar to the SUMC Project, new open spaces and bicycle and pedestrian connections would be created, which would serve to promote sustainable modes of transportation. Since a similar amount of development would occur under the Tree Preservation Alternative as under the SUMC Project, this alternative would have similar environmental, financial, and municipal infrastructure impacts on the City, as explained in more detail in the Impact Assessment, Section 5.5. In addition, the Tree Preservation Alternative would reduce impacts to Protected Trees to the greatest extent feasible. However, the Tree Preservation Alternative would include limited urban-village components, such as a mixed-use, transit-oriented environment, resulting in continued traffic problems in the area surroudnign the SUMC Sites. Nonetheless, the Tree Preservation Alternative would meet the majority of the City's objectives.

Historic Preservation Alternative[29]

Project Sponsors Objectives. The required renovation work, along with dimensions and other existing features of the 1959 Hospital Building complex that could not be modified, hindering the Historic Preservation Alternative's ability to achieve project objectives. In particular, the provision of state-of-the-art facilities to deliver high quality health care would be significantly compromised given the significant design inefficiencies that reuse would entail. It is estimated that the necessary interior work to enhance the structural soundness of these buildings could result in the loss of approximately five to ten percent of usable space. In addition, the Historic Preservation Alternative would not meet the SoM objectives of providing a state-of-the-art facility to support contemporary research and optimizing the SoM's ability to translate medical research discoveries into treatments and cures. As such, the Historic Preservation Alternative would not adequately meet the SUMC Project objectives, as discussed in further detail below.

Reuse of West, East, Core and Boswell Buildings for Clinic/Medical Office Purposes. As previously discussed, a significant amount of seismic structural retrofit work would be necessary under the Historic Preservation Alternative. It is estimated that the necessary interior work to enhance the structural soundness of these buildings could result in the loss of approximately five to ten percent of usable space. As such, the required renovations would result in further loss of usable space. This cumulative loss of space means that the same amount of uses as contemplated under the project could not be accommodated in a reuse scenario.

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29 Barbara Schussman, Bingham McCutchen LLP, Memorandum: Historic Preservation Alternative, November 12, 2008. Memo reviewed and confirmed by Marlene Berkoff, FAIA, Principal, Berkoff Facility Strategies.

The existing features of the SHC buildings constrain layout options under a reuse scenario. This is particularly true with respect to the West Core, East Core, and Boswell buildings. Unlike the West Pavilion, East Pavilion, and Central Core buildings, which are currently used for clinic purposes, the West Core, East Core, and Boswell[30] buildings are not currently configured to optimally and efficiently provide new clinic/medical office space. In fact, none of the existing spaces would have the correctly proportioned rooms or the proper array of room types. Because the exterior dimensions could not be changed, and numerous interior features such as support walls/columns and door locations could not be modified without adversely affecting the structural soundness of the buildings, the layout would be significantly hampered under a reuse scenario. This would equate to a less efficient design and therefore less space for clinic/medical office uses.

Other drawbacks resulting in the reuse of the West, East, Core, and Boswell buildings as compared to new clinic buildings include the paths of travel, relationships to other hospital buildings, and the ability to provide high quality health care. The advantages and efficiencies of new clinic buildings could not be achieved under the Historic Preservation Alternative and as such, the Historic Preservation Alternative would hinder SHC's ability to achieve its objectives of delivering high quality health care and services to its patients, and of maintaining its position as a leading provider of complex care.

Reuse of the Grant, Alway, Lane, and Edwards Buildings for School of Medicine Research Purposes. The required renovation work of the SoM buildings (Grant, Alway, Lane, and Edwards building) and existing structural walls and columns pose fundamental design challenges that impair this alternative's ability to achieve project objectives. In particular, the provision of state-of-the-art facilities and optimization of the School of Medicine's ability to translate medical research discoveries into treatments and cures would be compromised given the significant design inefficiencies that reuse would necessarily entail.

In order to reuse the Grant, Alway, Lane, and Edwards buildings, it is assumed that seismic structural retrofit work would be necessary. In order to enhance the structural soundness of these buildings (e.g., thickening of the walls from the interior, inclusion of interior brace frames), a loss of approximately five to ten percent of usable space could result. As such, the required renovations would result in further loss of usable space, which would not meet the objectives of the SUMC Project sponsors.

The other required renovations (such as installation of interior ducts for air exchange, venting, and utilities) would result in further loss of usable space. This cumulative loss of space would prevent full achievement of project objectives. Research programs are measured by how many benches they have rather than total square footage assigned. As such, a loss of usable space equates to a loss of benches, which means that the same capacity as proposed under the SUMC Project could not be accommodated under a reuse scenario.

In addition, the current dimensions of the SoM buildings are not conducive to modern laboratory design layout. Therefore, under the reuse scenario, the configuration of space would be more

[30] Although the Boswell building currently contains clinic uses, it is configured awkwardly for these purposes, in much the same way as the West Core and East Core buildings are configured.

constrained since there are physical limitations that would have to be designed around. This would result in a less efficient design, which equates to less space for research facilities. Not only does this further constrain layout and reduce the amount of research space, it also affects the quality of the facilities. Modern science is an intensely social activity; therefore, "science functions best when it is supported by architecture that facilitates both structured and informal interaction, flexible use of space, and sharing of resources."[31] Under a reuse scenario, these objectives would likely be hampered since the physical limitations of the space, as opposed to sound design principles, would dictate the layout.

The reduced amount of available space that would occur under the Historic Preservation Alternative affects the ability to meet other modern design standards for research laboratories as well. For example:

- **Required Lab-to-Lab Support Ratio.** A building's "Lab-to-Lab support" ratio is a key component of laboratory facility planning. However, during the development of the Grant, Alway, Lane, and Edwards buildings in the late 1950's, the needs of researchers for lab support space were not nearly as great as they are today, and therefore these buildings were designed to function at a lower Lab-to-Lab support ratio than what is standard today. With new construction and more efficient layouts, the research facilities could be configured to achieve higher Lab-to-Lab support ratio standard; however, this would not occur under the Historic Preservation Alternative. As such, this alternative would not meet the target Lab-to-Lab support ratio.
- **Quantity of Wet Lab Space Required.** The SUMC Project contemplates developing 80 percent of the space in the FIMs as wet research lab space, with the remaining 20 percent being used for office, administrative, and other ancillary spaces. Currently, the existing buildings have a 60/40 mix of predominantly wet lab to office/administrative space. The desired amount of wet research lab space could be achieved through the efficient design of space; however, the Historic Preservation Alternative would not accomplish this. While 80 percent of the space could still be developed as wet research lab space, the total amount of lab space area would need to be reduced to compensate for the decreased amount of available space under the reuse scenario.
- **Special Requirements for Emerging Research (Imaging/Electron Microscopes, etc.).** A significant percentage of future development in medical research is expected to come from advancement in imaging technologies. However, the reduced amount of usable space under the Historic Preservation Alternative would make it difficult to construct these spaces. In addition, the types of emerging imaging technologies that are contemplated require higher standards for vibration than are available in the existing buildings. To achieve modern standards for emerging imaging technology, more steel beams and columns would need to be added; the floor slabs would need to be thickened; and the ducts would need to be made even larger, all of which would result in increased costs and further loss of usable space.

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31 *See generally* "Whole Building Design Guide: Trends in Laboratory Design," http://www.wbdg.org/ resources/ labtrends.php?=lab_wet.

Beyond the issue of programmatic needs and the technical challenges of reusing the Grant, Alway, Lane, and Edwards buildings, there are logistical issues associated with this alternative as well. Under the SUMC Project, new construction would proceed ahead of demolition. Specifically, (1) FIM 1 would be constructed and occupied with Edwards building occupants, and then Edwards would be demolished; (2) FIM 2 would be constructed and occupied with the Lane and Alway building occupants, and then those buildings would be demolished; and (3) FIM 3 would be constructed and occupied with Grant building occupants, and then the Grant building would be demolished.

In contrast, under the Historic Preservation Alternative, occupants would be required to vacate the Grant, Alway, Lane, and Edwards buildings and would then need to be housed in temporary facilities until the renovations were complete. Therefore, the alternative necessarily would result in significant displacement of research programs which may suffer permanent set-backs, loss of key faculty, and loss of research funding.

Another complication would involve the difficult task of locating adequate temporary space to accommodate these occupants within a reasonable driving distance, and in particular to accommodate the large amount of displaced wet lab space (approximately 150,000 square feet). Finally, the logistics of continuing operations in certain buildings while renovating others would be extremely challenging and likely would have vibration and noise impacts that would negatively affect the remaining occupants and their research.

City Objectives. The Historic Preservation Alternative would meet some, but not all, of the City objectives. The new SHC and LPCH hospital buildings would be constructed to full build-out potential; therefore, the hospitals would be able to meet long-term regional needs for emergency and disaster preparedness. The new hospitals would employ state-of-the-art technology and design principals, urban planning, and sustainable development and would create high quality employment districts. Similar to the SUMC Project, new open spaces and bicycle and pedestrian connections would be created, such as the new plazas and linkages that would replace the existing paved roads of Blake-Wilbur Drive and the SUMC Promenade. Since a similar amount of development would occur under the Historic Preservation Alternative as under the SUMC Project, this alternative would have similar environmental, financial, and municipal infrastructure impacts on the City, as explained in more detail in the Impact Assessment, Section 5.5. However, one impact that would be significantly lessened under this alternative would be the impact to the 1959 Hospital Building complex. Since this building would be retained, this alternative would support the City's objective of encouraging public and private upkeep and preservation of resources that have historic merit.

Although the Historic Preservation Alternative would retain the existing 1959 Hospital Building complex and would meet the historic preservation goal, the preservation of the building would limit state-of-the-art technologies and sustainable design at the SHC clinic/medical offices and the SoM. In addition, the Historic Preservation Alternative would include limited urban-village components, such as a mixed-use, transit-oriented environment, resulting in continued traffic problems in the area surrounding the SUMC Sites. Nonetheless, the Historic Preservation Alternative would meet the majority of the City's objectives.

Village Concept Alternative

Project Sponsors Objectives. The Village Concept Alternative would meet all of the objectives of the SUMC sponsors because this alternative would include the SUMC Project as proposed. Development of the Village Concept Alternative would construct new hospital and medical office buildings, allowing each hospital to maintain its position as a leading provider of health care. Under this alternative, SHC and LPCH would provide sufficient beds and other facilities to meet projected future growth in demand. All regional needs for emergency and disaster preparedness would be met through maintenance of SHC and LPCH. In addition, the existing SoM buildings would be replaced by the new FIM buildings; therefore, this alternative would achieve the objective of replacing outmoded research facilities with state-of-the-art research facilities to support contemporary translational research. The Village Concept Alternative also would provide sufficient faculty offices, research laboratories, and administrative support space to meet the SoM's projected needs would maintain the opportunity to provide responsible and sustainable design for the SoM's operating systems, water systems, and use of physical materials. In addition, the alternative could allow sufficient design and entitlement flexibility to be able to adapt to changes in medical research needs and changes in technology. As such, the Village Concept Alternative would attain all of the SUMC Project sponsors objectives.

City Objectives. The Village Concept would meet the objectives outlined by the City of Palo Alto. The new SHC and LPCH hospitals would be constructed to full build-out potential; therefore, the hospitals would be able to meet long-term regional needs for emergency and disaster preparedness. The new hospitals would employ state-of-the-art technology and design principals, urban planning, and sustainable development and would create high quality employment districts. Similar to the SUMC Project, new open spaces and bicycle and pedestrian connections would be created, which would serve to promote sustainable modes of transportation. Since the same amount of development would occur at the SUMC Sites under the Village Concept Alternative as under the SUMC Project, this alternative would have similar environmental, financial, and municipal infrastructure impacts on the City, as explained in more detail in the Impact Assessment, Section 5.5.

In addition, unlike the SUMC Project and the other alternatives, the City developed the Village Concept Alternative to provide opportunities to enhance the SUMC Project by creating a more walkable, bikeable, mixed-use, transit-oriented, and well-connected urban environment. The Village Concept Alternative considers comprehensively and long-term the SUMC Project and the SUMC Project's relationship to its surrounding context. A key goal of the Village Concept Alternative is to ensure that the SUMC Project contributes to, and does not preclude, future opportunities to create an urban, transit-oriented village that can capture the potential travel behavior, air quality protection, and greenhouse gas reduction benefits associated with the performance of well-designed urban villages. To achieve this end, the Village Concept Alternative would attain the basic objectives of the SUMC Project, lessen the environmental effects of the SUMC Project, and provide benefits of an urban village environment consistent with the values and character of the City of Palo Alto. Therefore, the Village Concept Alternative would meet all of the goals of the City.

5.5 IMPACT ASSESSMENT

This section evaluates whether the alternatives would reduce significant impacts of the SUMC Project to less-than-significant levels and/or would generate impacts other than those identified for the SUMC Project. Summarized lists of recommended mitigation measures for each alternative are provided in the below analysis; however, these mitigation measures are fully described in Section 3 of this document. In addition, a summary comparative analysis of the SUMC Project and the alternatives is provided in Table 5-8.

No Project Alternative A: Retrofitting Only/No New Structures[32]

Land Use

Conflicts with Applicable Land Use Designations and Zoning. Because No Project Alternative A would involve replacement of seismically unsound structures and would not involve a net increase in floor area, a Comprehensive Plan Amendment and/or rezoning of the SUMC Sites would not be required. It is assumed that new structures would conform to applicable development regulations, and that there would be no conflict with existing land use designations or zoning under this alternative. By comparison, the SUMC Project's impacts would be less than significant. (NI)

Conflicts with Comprehensive Plan Policies. With mitigation, no Comprehensive Plan policy conflicts were determined for the SUMC Project. However, No Project Alternative A would result in one significant policy conflict with Policy L-7, which requires new development to address regional needs and overall City welfare and objectives. Portions of the 1959 Hospital Building complex and the LPCH hospital that currently house inpatient beds could not be feasibly retrofitted to meet SB 1953 standards. As additional floor area would not be added, the hospitals' combined daily capacity for inpatients would be reduced by up to 456 patients. In fact, one or both of the hospitals could close under this alternative. By failing to meet local and regional demand for medical services, this alternative would conflict with Policy L-7, a significant and unavoidable impact. (S/SU)

Compatibility with Adjacent Land Use Character and Conflicts with Established Residential, Recreational, Educational, Religious, or Scientific Uses in the Area. The level of development proposed under No Project Alternative A would not exceed existing conditions and this alternative would not introduce a new land use that would conflict with existing uses. Therefore, no impact would occur, as with the SUMC Project. (NI)

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[32] Barbara Schussman, Bingham McCutchen LLP, Memorandum: SUMC Project Alternatives to be Evaluated in EIR, January 8, 2008 (revised September 29, 2008). Memo reviewed and confirmed by Marlene Berkoff, FAIA, Principal, Berkoff Facility Strategies.

Table 5-8
Assessment of SUMC Project Alternatives (Compared to the SUMC Project)

Impact	SUMC Project[a]	No Project Alternative A	No Project Alternative B	Reduced Intensity Alternative A	Reduced Intensity Alternative B	Tree Preservation Alternative	Historic Preservation Alternative	Village Concept Alternative
Land Use								
Conflicts with Applicable Land Use Designations and Zoning	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Conflicts with Comprehensive Plan Policies	S/LTS	S/SU	S/SU	S/SU	S/LTS	S/LTS	S/LTS	S/LTS
Compatibility with Adjacent Land Use Character and Conflicts with Established Residential, Recreational, Educational, Religious, or Scientific Uses in the Area	NI	NI	NI	NI	NI	NI	NI	NI
Division of an Established Community and Farmland Conversion	NI	NI	NI	NI	NI	NI	NI	NI
Adverse Changes to Existing or Planned Land Use Pattern	S/LTS	NI	NI	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Cumulative Impacts	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Visual Quality								
Temporary Degradation of Visual Quality	S/LTS	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Permanent Degradation of Visual Character Post Construction	S/LTS	LTS	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Alteration of Public Viewsheds, View Corridors, or Scenic Roads	S/LTS	NI	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Terrain Modification	NI	NI	NI	NI	NI	NI	NI	NI
New Source of Light and Glare	S/LTS	NI	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Shadowing of Public Open Spaces	LTS	NI	LTS	LTS	LTS	LTS	LTS	LTS
Cumulative Impacts	LTS	NI	LTS	LTS	LTS	LTS	LTS	LTS

NI = No Impact *LTS = Less-than-Significant* *S=Significant* *SU= Significant Unavoidable*

Table 5-8
Assessment of SUMC Project Alternatives (Compared to the SUMC Project)

Impact	SUMC Project[a]	No Project Alternative A	No Project Alternative B	Reduced Intensity Alternative A	Reduced Intensity Alternative B	Tree Preservation Alternative	Historic Preservation Alternative	Village Concept Alternative
Transportation								
Construction Impacts	S/LTS	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Intersection LOS	S/SU	NI	NI	NI	S/SU	S/SU	S/SU	S/SU
Impacts on Roadway Segments	S/SU	NI	NI	NI	S/LTS	S/SU	S/SU	S/SU
Local Circulation Impacts	S/LTS	NI	NI	NI	S/LTS	S/LTS	S/LTS	S/LTS
Freeway Impacts	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Bicycle and Pedestrian Impacts	S/LTS	NI	NI	NI	S/LTS	S/LTS	S/LTS	S/LTS
Transit Impacts	S/LTS	NI	NI	NI	S/LTS	S/LTS	S/LTS	S/LTS
Parking Impacts	LTS	NI	NI	NI	S/LTS	LTS	LTS	LTS
Emergency Impacts	S/LTS	NI	NI	NI	S/LTS	S/LTS	S/LTS	S/LTS
Cumulative Impacts	S/LTS	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Air Quality								
Construction Criteria Air Pollution Emissions	S/SU	S/LTS	S/SU	S/SU	S/SU	S/LTS	S/SU	S/SU
Operational Criteria Air Pollution Emissions	S/SU	NI	NI	LTS	S/SU	S/SU	S/SU	S/SU
Construction and Operational TACs	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Cumulative Impacts	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU
Climate Change								
Consistency with the Climate Protection Plan	S/SU	LTS	LTS	LTS	S/LTS	S/SU	S/SU	S/SU
Result in Significant Emissions of Greenhouse Gases	S/SU	LTS	LTS	LTS	S/LTS	S/SU	S/SU	S/SU

NI = No Impact *LTS = Less-than-Significant* *S=Significant* *SU= Significant Unavoidable*

Table 5-8
Assessment of SUMC Project Alternatives (Compared to the SUMC Project)

Impact	SUMC Project[a]	No Project Alternative A	No Project Alternative B	Reduced Intensity Alternative A	Reduced Intensity Alternative B	Tree Preservation Alternative	Historic Preservation Alternative	Village Concept Alternative
Noise								
Construction Impacts	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU
Operational Impacts	S/SU	NI	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU
Cumulative Impacts	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU
Cultural Resources								
Impacts on the Stone Building Complex	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/LTS	S/SU
Impacts on the Hoover Pavilion	S/LTS	NI	NI	LTS	S/LTS	S/LTS	S/LTS	S/LTS
Impacts on Archaeological Resources and Human Remains	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Impacts on Paleontological Resources	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Cumulative Impacts	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/LTS	S/SU
Biological Resources								
Special Status Plant or Wildlife Resources	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Loss of Riparian or Other Sensitive Habitats	LTS	NI	LTS	LTS	LTS	LTS	LTS	LTS
Interference with Species Movement, Wildlife Corridors, or Nursery Sites	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Effect on Protected Trees	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU
Conflicts with a Habitat Conservation Plan or Natural Community Conservation Plan	NI	NI	NI	NI	NI	NI	NI	NI
Cumulative Impacts	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU	S/SU
Geology, Soils, and Seismicity								
Exposure to Seismic-Related Hazards	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Exposure to Other Geotechnical Hazards	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS

NI = No Impact *LTS = Less-than-Significant* *S=Significant* *SU= Significant Unavoidable*

Table 5-8
Assessment of SUMC Project Alternatives (Compared to the SUMC Project)

Impact	SUMC Project[a]	No Project Alternative A	No Project Alternative B	Reduced Intensity Alternative A	Reduced Intensity Alternative B	Tree Preservation Alternative	Historic Preservation Alternative	Village Concept Alternative
Cause Substantial Erosion or Siltation	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Cumulative Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Hydrology								
Flood Risks and Flood Flows	NI	NI	NI	NI	NI	NI	NI	NI
Groundwater Recharge and Local Water Table	LTS	NI	LTS	LTS	LTS	LTS	LTS	LTS
Groundwater Quality	S/LTS	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Stormwater Runoff, Erosion, and Streambank Instability	LTS	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Flooding and Stormwater Conveyance Capacity	LTS	NI	LTS	LTS	LTS	LTS	LTS	LTS
Degradation of Surface Water Quality	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Dam Failure Inundation	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Violation of Any Water Quality Standard or Waste Discharge Requirement (WDRs)	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Cumulative Impacts	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Hazardous Materials								
Exposure to Hazardous Materials During Construction	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Exposure to Hazardous Materials During Operation	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Safety Hazards to Schools	LTS	LTS	LTS	LTS	LTS	LTS	LTS	LTS
Wildfire Risks	NI	NI	NI	NI	NI	NI	NI	NI
Safety Hazards from Public Airports	NI	NI	NI	NI	NI	NI	NI	NI
Emergency Response or Evacuation Plans	S/LTS	LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Cumulative Impacts	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS

NI = No Impact *LTS = Less-than-Significant* *S=Significant* *SU= Significant Unavoidable*

Table 5-8
Assessment of SUMC Project Alternatives (Compared to the SUMC Project)

Impact	SUMC Project[a]	No Project Alternative A	No Project Alternative B	Reduced Intensity Alternative A	Reduced Intensity Alternative B	Tree Preservation Alternative	Historic Preservation Alternative	Village Concept Alternative
Population and Housing								
Population Increases	LTS	NI	NI	NI	LTS	LTS	LTS	LTS
Displacement of Housing	NI	NI	NI	NI	NI	NI	NI	NI
Jobs to Employed Residents Ratio	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cumulative Impacts	S/SU	NI	NI	NI	LTS	LTS	LTS	LTS
Public Services								
Impacts on Police Services	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Impacts on Fire Services	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Impacts on Schools	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Impacts on Parks and Recreation	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Cumulative Impacts	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Utilities								
Water Demand	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Wastewater Generation	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Stormwater Generation	LTS	NI	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS	S/LTS
Solid Waste Generation	LTS	NI	NI	LTS	LTS	LTS	LTS	LTS
Energy Demand	LTS	NI	LTS	LTS	LTS	LTS	LTS	LTS
Cumulative Impacts	LTS	NI	LTS	LTS	LTS	LTS	LTS	LTS

Source: PBS&J, 2010.

Notes:

a. Before mitigation/After mitigation (e.g. S/LTS)

NI = No Impact *LTS = Less-than-Significant* *S=Significant* *SU= Significant Unavoidable*

Division of an Established Community and Farmland Conversion. The SUMC Project would have no impact on the division of an established community or farmland conversion. Similarly, No Project Alternative A would not add physical barriers that might result in restriction of customary circulation patterns or a disruption of land use connectivity, nor would it require the acquisition and development of lands currently used for agricultural purposes. No impact would occur. (NI)

Adverse Changes to Existing or Planned Land Use Pattern. No Project Alternative A would not alter the existing land use pattern. Therefore, it would not interfere with implementation of existing plans and policies or significantly alter the type or intensity of existing land uses within the Project Vicinity. Unlike the SUMC Project, no impact would occur under this alternative. (NI)

Cumulative Impacts. This alternative, in combination with other reasonably foreseeable probable future development in the area, would have no cumulative impact on overall existing or planned land uses in the vicinity of the SUMC Sites. (NI)

Visual Quality

Temporary Degradation of Visual Quality. Renovations and retrofits would occur under No Project Alternative A, but no new structures would be constructed and no existing buildings would be demolished. As such, temporary degradation of visual quality during construction would be less than significant. (LTS)

Permanent Degradation of Visual Character Post Construction. Renovations and retrofits would occur under No Project Alternative A, but no new structures would be constructed, no existing buildings would be demolished, and current landscaping would be retained. However, exterior bracing would be installed at the 1959 Hospital Building complex for its SoM portions, which would result in some on site visual alterations. However, this would be a minor change to the overall appearance of the Main SUMC Site and would not substantially change on-site character. Therefore, the impacts on visual resources would be less than significant. (LTS)

Alteration of Public Viewsheds, View Corridors, or Scenic Roads. No new buildings would be constructed on the SUMC Sites; therefore, massing would not increase and no public view sheds or view corridors would be impacted. Although the exterior of the 1959 Hospital Building complex might be altered, these changes would not be visible from the Sand Hill Road Scenic Corridor. No Project Alternative A would result in no impacts to public view sheds, view corridors, or scenic roads. (NI)

Terrain Modification. Since the SUMC Sites are relatively flat, No Project Alternative A would have no impact on terrain modifications, like the SUMC Project. (NI)

New Sources of Light and Glare. No new structures would be built under No Project Alternative A; therefore, a new source of light and glare would not be created, resulting in no impact. (NI)

Shadowing Public Open Spaces. No new shadows would be cast under No Project Alternative A since no new buildings would be constructed. No impact would occur. (NI)

Cumulative Impacts. Since no new buildings would be added to the SUMC Sites under No Project Alternative A, this alternative would not cumulate with other foreseeable development. (NI)

Transportation

Construction Impacts. Transportation impacts under all alternatives are addressed in Appendix M, which contains the Alternatives Analysis by AECOM Transportation. This section extracts from Appendix M. Under No Project Alternative A, there would be virtually no changes to the level of construction traffic entering or exiting the Main SUMC Site. There may be minor changes during the retrofit and utility routing work. Construction workers may contribute to additional traffic during the retrofit and utility work, although overall increases in traffic would not be significant. Also, construction workers typically arrive on site before the start of the AM Peak Hour, and leave before the start of the PM Peak Hour. Impacts would thus be less than significant without mitigation, unlike the SUMC Project, which would have less-than-significant impacts with mitigation. (LTS)

Operational Impacts. This alternative would involve the internal relocation of some patients and staff within the medical facilities. This relocation within the SUMC Sites may have a minor impact in terms of visitors and staff deciding to park in a different parking structure, closer to their new location. However, overall, there would be no increase in operations, and one or both of the hospitals would close at 2030. Therefore, the number of trips generated by the hospitals under this alternative would be less than existing conditions. Unlike the SUMC Project, this alternative would have no adverse traffic impact on study intersections, freeway segments, residential roadways, bicycle and pedestrian access, transit, parking, and emergency vehicle access. (NI)

Cumulative Construction Impacts. As with the SUMC Project analysis, the operational analysis of this alternative captures both project-level and cumulative-level impacts. Construction traffic from this alternative and other foreseeable and concurrent construction could utilize the same routes. However, because the cumulative level of construction under this alternative would be less than cumulative construction with the SUMC Project, cumulative impacts would be less than significant. (LTS)

Air Quality

Construction Criteria Air Pollutant Emissions. Under No Project Alternative A, there would be no need for large-scale activity/equipment use associated with demolition, excavation/foundation work, and new building construction. Rather, construction would focus on renovations to existing hospital buildings, support facilities, and the rerouting of utility lines. Although some use of heavy duty equipment would be required for the renovation and utility work, this alternative would likely avoid the significant equipment-related NO_x emissions identified for the SUMC Project during early construction phases. However, for dust emissions, No Project Alternative A would need to implement BAAQMD-required practices to reduce dust emissions and particulate concentrations to a less-than-significant level. (S/LTS)

- AQ-1.1: Implement Recommended Dust Control Measures

Operational Criteria Air Pollutant Emissions. The renovated structures would not contain new stationary pollutant sources or generate additional new motor vehicle trips with their associated air pollutant emissions. This alternative would thus have no impacts associated with emissions of criteria pollutants or localized concentrations of pollutants, such as CO. (NI)

Construction and Operational Toxic Air Contaminants (TACs). The SUMC Project Health Risk Assessment evaluated TAC emissions from construction equipment and new operational sources (i.e., emergency diesel generators, delivery trucks, and additional medical helicopter flights/heliport) and found the associated health impacts to be less than significant. Under No Project Alternative A**,** construction-phase TAC emissions would be substantially lower because the use of diesel-powered construction equipment would be substantially lower for renovations. Further, the operational sources of TACs identified for the SUMC Project would either not be added (i.e., the diesel generators) or their configuration would remain unchanged from existing conditions (i.e., truck loading docks and heliport). Thus, construction and operational TAC impacts would be less than significant. (LTS)

Cumulative Impacts. The SUMC Project's emissions of NO_x during construction and of TACs during construction and operation were determined to have a cumulatively considerable contributions to significant cumulative impacts. Under No Project Alternative A**,** emissions of NO_x during construction would likely not exceed the Bay Area Air Quality Management District's (BAAQMD's) 80 lbs/day threshold. However, the TACs emitted during construction, though likely posing a lesser heath risk than those of the SUMC Project, would still make a cumulatively considerable contribution to the high TAC background levels of the area in which the SUMC Sites are located. Consequently, this alternative's cumulative TAC impacts would be cumulatively significant. Mitigation Measure AQ-1.2 would help reduce TAC emissions from this alternative, but not to a less than considerable level. Consequently, this alternative's cumulative TAC impacts would be cumulatively significant. (S/SU)

- AQ-1.2: Implement Diesel Emission Reduction Measures

Climate Change

Consistency with the Climate Protection Plan. Under this alternative, the 1959 Hospital Building complex would be renovated and separated from the rest of the hospital buildings. No Project Alternative A would therefore generate greenhouse gases during construction. Construction emissions would represent a small portion of the City's annual emissions because the construction activities proposed under this alternative are relatively minor; construction would involve only retrofit work plus utility relocation. Although the BAAQMD is not introducing greenhouse gas thresholds for construction activities, renovation activities would be required to comply with all applicable BAAQMD recommended greenhouse gas reduction measures in order to be considered less than significant.

AB 32, the California Air Resources Board's (CARB) Scoping Plan, incorporates a 30 percent reduction target from 2020 business as usual (BAU) emissions limits. The City's Climate Protection Plan's incorporates this BAU approach to quantify emissions from significant, new projects which were not included in the City's existing inventory. As such, this analysis applies the 2020 reduction goal (equivalent to 30 percent below BAU) as a target threshold for compliance with the City Climate

Protection Plan. Since No Project Alternative A would potentially result in the closing of one or both hospitals and would not include the programs or design features stipulated with the SUMC Project the resulting emissions from project operations would generally result in the same as or a reduction in emissions from existing conditions. During operation, No Project Alternative A would not emit any additional greenhouse gases than it currently is. Therefore, No Project Alternative A would have a less-than-significant environmental impact with respect to consistency with the Climate Protection Plan. (LTS)

Result in Significant Emissions of Greenhouse Gases. Because No Project Alternative A would not include extensive development, this alternative is not assumed to include the Emissions Reduction Program such as that proposed under the SUMC Project that would minimize greenhouse gas emissions and further the goals of the Palo Alto Climate Protection Plan. This alternative would not result in operational emissions greater than those currently existing, but would have some less than considerable construction emissions. (LTS)

Noise

Construction Impacts. Under No Project Alternative A, construction activities would focus on renovations to existing hospital facilities and rerouting and extending utility lines. No large-scale demolition or new building construction would occur. However, noise from the lesser level of construction activity (compared to the SUMC Project) could still impact sensitive receptors on site over extended periods, especially if some portion of the renovation work is allowed to occur in buildings still occupied by patients and workers. Mitigation for best management practices would apply to this alternative; however, even with mitigation, noise impacts would be significant and unavoidable, as with the SUMC Project. (S/SU)

- NO-1.1: Implement Best Management Practices to Reduce Construction Noise

Operational Impacts. Under No Project Alternative A, operational noise from on-site HVAC equipment, emergency generators, loading dock/parking facility operations, medical helicopter flyovers, and from motor vehicle traffic would remain at or very close to existing levels. Therefore, this alternative would have no impacts as compared to the existing noise environment, unlike the SUMC Project, which would have significant and unavoidable operational noise impacts. (NI)

Cumulative Impacts. Significant cumulative construction noise impacts were identified for the SUMC Project because other constructions sites are located near enough to the SUMC Sites to allow audible combination of noise levels if/when construction activity occurs simultaneously on proximate sites. No significant cumulative construction vibration or operational noise impacts were identified for the SUMC Project. Under No Project Alternative A, there would be construction noise and vibration impacts from the on-site renovation and utility routing activities and so, there would be potential for cumulatively considerable on- and off-site noise exposure to patients, workers, and nearby residents; this would be a significant cumulative construction noise impact. Mitigation Measure NO-1.1 would reduce the contribution, although not to less than considerable levels. However, this alternative would not make considerable contributions to cumulative construction vibration or operational noise levels, which would be less than significant. (S/SU)

Cultural Resources

Impacts on the Stone Building Complex. No Project Alternative A would have significant impacts on historic resources, similar to the SUMC Project. The Stone Building complex would not be demolished under this alternative, as under the SUMC Project; however, the exterior bracing needed to seismically retrofit the buildings could alter or obscure the character-defining features, resulting in a significant impact. Vibration from nearby construction and from separating the noncompliant buildings from the hospital buildings could also significantly affect the Stone Building complex. Although No Project Alternative A would result in a significant impact, this impact would be less severe than under the SUMC Project since the Stone Building complex would be retained under this alternative. Nonetheless, due to seismic retrofiting that could impact the integrity of the Stone Building complex, the building could be ineligible to be listed under the CRHR.

The following mitigation measures, which are new measures not identified for the SUMC Project, would help reduce the impacts on the Stone Building complex; however, not to a less-than-significant level. (S/SU)

- *Conduct Protocol and Procedures for Bracing.* Development of any plans for seismic retrofitting and bracing of the Stone Building complex shall be completed by, or in consultation with, an individual or firm that meets the Secretary of the Interior's Qualification Standards for Historic Architecture in order to develop plans that have a minimal impact on the historic, character-defining features of the building.
- *Monitor and Repair Potential Damage During Construction.* The project applicant shall hire a registered structural engineer, with a minimum of five years of experience in the rehabilitation and restoration of historic buildings, to investigate the existing connection between portions of the buildings within the Stone Building complex that must be separated in order to comply with OSHPD requirements. The structural engineer shall prepare a report of findings, recommendations, and any related design modifications necessary to retain the structural integrity of the buildings during and after separation. The structural engineer (in consultation with a historic preservation architect, who meets or exceeds the Secretary of the Interior's Qualification Standards for Historic Architecture, if necessary) shall prepare designs and specifications for the separation of the buildings. The structural engineer (with geotechnical consultation as necessary) shall also determine if any excavation that is required for utility routing would have the potential for settlement and whether the buildings would require underpinning and/or shoring. All documents prepared in accordance with this measure shall be reviewed and approved by the Planning Director. All recommendations made by the structural engineer shall be implemented.

Impacts on the Hoover Pavilion. This alternative would not include construction-related activities, including the demolition of the sheds and storage buildings, at the Hoover Pavilion Site. As such, No

Project Alternative A would avoid vibration impacts on the Hoover Pavilion, resulting in no impact. (NI)

Impacts on Archaeological Resources and Human Remains. As with the SUMC Project, it is possible, although unlikely, that archaeological resources and human remains could be encountered during No Project Alternative A's ground-disturbing activities. With the implementation of the following mitigation measures the impact to archaeological resources and human remains would be reduced to less than significant. (S/LTS)

- CR-2.1: Construction Staff Training and Consultation
- CR-3.1: Conduct Protocol and Procedures for Encountering Human Remains

Impacts on Paleontological Resources. The entire Bay Area region is considered to be rich in paleontological resources, and there have been significant finds in the immediate vicinity of the SUMC Sites. Sensitivity to paleontological resources is therefore considered high throughout the SUMC sites and adjacent areas. Although minimal work would occur under No Project Alternative A, as with the SUMC Project, disturbance of any paleontological resources is a significant impact. However, the following mitigation measure, as identified for the SUMC Project, would reduce the impact to less than significant. (S/LTS)

- CR-4.1: Conduct Protocol and Procedures for Encountering Paleontological Resources

Cumulative Impacts. Cumulative impacts on archaeological and paleontological resources and human remains from this alternative and adjacent development could be significant due to potential presence of these resources in the area. As with the SUMC Project, this analysis conservatively finds that this alternative would have a cumulatively considerable contribution to the cumulative impact. Mitigation measures described above would ensure that this alternative's contribution would be less than cumulatively considerable.

As discussed in Section 3.8, Cultural Resources, cumulative development has had a pre-existing significant cumulative impact on other E.D. Stone structures in Palo Alto. This alternative could have a cumulatively considerable contribution to the cumulative impact by diminishing the historical integrity of the Stone Building complex at the Main SUMC Site. Mitigation such as Mitigation Measures CR-1.2 through CR-1.5, involving documentation and protective measures, would reduce the impact on historic resources; however, the loss of the Stone Building complex would remain a cumulatively considerable contribution to the cumulative impact, as with the SUMC Project. (S/SU)

Biological Resources

Special Status Plant or Wildlife Resources. Generally, there is no habitat on-site that is capable of supporting special-status plants or state or federally listed wildlife. However, buildings in the SUMC area could provide roosting habitat for special-status bat species known from the region, and trees in the SUMC area could provide nesting habitat for Cooper's hawk. Removal of trees containing Cooper's hawk nests, or modification to buildings containing active bat roosts could result in the loss of Cooper's hawk or their active nests, individual bats, bat colonies, or their habitat. No Project Alternative A would modify structures at the Main SUMC Site and potentially result in the removal of trees; therefore, implementation of No Project Alternative A could have a significant impact on Cooper's hawk and protected bat species, similar to the SUMC Project. However, this would be less of an impact than the SUMC Project because no structures would be removed at the Hoover Pavilion Site, and a lower number of trees are likely to be removed. The following mitigation measures, as presented in Section 3.9, Biological Resources, would reduce No Project Alternative A's impact on special-status and protected bats to a less-than-significant level. (S/LTS)

- BR-1.1: Conduct Pre-Demolition Survey
- BR-1.2: Avoid Roosting Areas
- BR-1.3: Develop and Employ Bat Nest Box Plan
- BR-1.4: Avoid Tree Removal During Nesting Season
- BR-1.5: Protect Cooper's Hawk in the Event of Nest Discovery

Loss of Riparian or Other Sensitive Habitats. The SUMC Project would result in a less-than-significant impact due to the potential for sedimentation in San Francisquito Creek during the Project's 12-year construction period. Because the No Project Alternative A would not require substantial construction, other than seismic improvements and some utility re-routing, this alternative would not impact riparian or sensitive habitats. No Project Alternative A would have no impact on the riparian habitat of San Francisquito Creek. (NI)

Interference with Species Movement, Wildlife Corridors, or Nursery Sites. No Project Alternative A would involve renovations and retrofits and would not expand existing facilities. However, modifications to existing structures, ground disturbance to reroute or extend utility lines to compliant and non-compliant structures would occur, thus potentially requiring the removal of on-site trees, or disturbance of birds that nest on buildings (i.e., swallows, phoebes, etc.). The removal of trees, or nests on buildings during nesting season could result in a significant impact. While the removal of on-site trees or nests on buildings would occur to a lesser degree under No Project Alternative A compared to the SUMC Project, impacts to migratory bird nests under No Project Alternative A would remain significant. The following mitigation measures, recommended for the SUMC Project, would reduce the impact to less than significant. (S/LTS)

- BR-3.1: Avoid Tree Removals or Building Demolition During Nesting Season
- BR-3.2: Protect Birds in the Event of Nest Discovery

Impacts on Protected Trees. There are 71 Protected Trees that would be removed under the SUMC Project. No Project Alternative A would involve renovations and retrofits and would not expand existing facilities. While current biological conditions would generally remain the same, ground disturbance to reroute or extend utility lines to compliant and non-compliant structure would occur, thus potentially impacting Protected Trees. The removal of Protected Trees would result in a significant impact, although to a significantly lesser extent that the SUMC Project since this alternative would not construct new buildings at Kaplan Lawn and the FIM 1 grove. The following mitigation measures, as identified for the SUMC Project, would reduce this alternative's impact on Protected Trees. However, these mitigation measures would not be able to avoid and preserve all Protected Trees; therefore, No Project Alternative A would result in a significant and unavoidable impact, as with the SUMC Project. (S/SU)

- BR-4.1: Prepare a Tree Preservation Report for all Trees to be Retained
- BR-4.2: Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks
- BR-4.3: Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention
- BR-4.4: Provide a Tree Preservation Bond/Security Guarantee
- BR-4.5: Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category

Conflicts with an HCP or NCCP. The Santa Clara Valley HCP is the nearest adopted HCP/NCCP in the region, but the SUMC Sites are not included within its boundaries. The Stanford University HCP is currently out for public review and has not been adopted. As such, similar to the SUMC Project, No Project Alternative A would have no impact on an applicable HCP or natural community conservation plan. (NI)

Cumulative Impacts. Cumulative development of past, current, and reasonably foreseeable probable future development, could negatively impact special-status bats, Cooper's hawk, and migratory birds, thus resulting in a significant cumulative impact on these resources. However, the size of disturbance within the project area under No Project Alternative A is smaller than the SUMC Project. No Project Alternative A's contribution to regional loss of urban habitat would be less than with the SUMC Project. Therefore, as with the SUMC Project, with implementation of Mitigation Measures BR-1.1 to BR-1.3 for special-status bats, and Mitigation Measures BR-1.4 and BR-1.5 for Cooper's hawk, this alternative's contribution to the regional loss of urban habitat for special-status bats and Cooper's hawk would be less than cumulatively considerable. Similar to the SUMC Project, even with implementation of mitigation measures discussed above, the contribution of No Project Alternative A to the cumulative loss of Protected Trees would be cumulatively considerable. (S/SU)

Geology, Soils, and Seismicity

Exposure to Seismic-Related Hazards. No Project Alternative A would have the same potential as the SUMC Project to expose people or structures to substantial adverse effects involving rupture of a known earthquake fault and landslides. The SUMC Sites, including the Main SUMC Site and Hoover Pavilion Site, are not in an Alquist-Priolo Earthquake Fault Zone, nor is there other substantial evidence that known active faults exist beneath the SUMC Sites. In addition, the SUMC Sites are nearly level, eliminating landslides as a potential hazard.

No Project Alternative A would have the same potential as the SUMC Project (i.e., less than significant) to expose people or structures to substantial adverse effects involving strong seismic ground-shaking, seismic-related ground failure (including liquefaction), or expansive soil. Hospital facilities that could be modified to meet the 2013 and 2030 deadlines would be retrofitted to OSHPD 1 standards (a distinct subset of California Building Code [CBC] requirements applied to hospital buildings and administered by the Office of Statewide Health Planning and Development), while hospital facilities that could not be modified to meet the standards would no longer be used for hospital purposes and would be separated from the hospital buildings, as required. The re-assignment of such facilities to non-hospital uses would not alter their geotechnical stability from their current condition. Major future retrofitting of such facilities would be subject to the requirements of the then-current City Building Code and possibly OSHPD 2 or OSHPD 3 (distinct subsets of CBC requirements applied to certain non-hospital medical care buildings and administered by the City), depending on the non-hospital use, regarding minimum standards for geotechnical site investigation, seismic-resistant earthwork, construction design criteria, satisfactory performance of temporary cut or fill slopes, analysis and appropriate remediation for expansive or liquefiable soils, and erosion control.

Standard procedures that apply to projects throughout the State would apply to No Project Alternative A, including the use of geotechnical investigations to set design parameters for the retrofitting of these facilities, the investigation and treatment of areas suspected of containing expansive soils or liquefiable soils, and the establishment of appropriate foundation type and support. Standard techniques for correcting any unsuitable conditions are available and are well-understood by geotechnical engineers and construction contractors in the Bay Area, so no extraordinary measures would be needed to retrofit buildings under No Project Alternative A to ensure seismic safety. With oversight responsibility vested in the OSHPD Facilities Development Division (FDD) for hospital buildings and in the City for non-hospital buildings, there would be a very low probability that any design feature approved by either agency would have other than a less-than-significant potential to expose people or property to ground-shaking, seismic-related ground failure (including liquefaction), landslides, or expansive soils hazards. (LTS)

Exposure to Other Geotechnical Hazards. The SUMC Sites, including the Main SUMC Site and Hoover Pavilion Site, are nearly level, as is the land on all sides of the SUMC Sites. Consequently, on- or off-site land sliding would not be a natural hazard. Slope stability issues related to the sides of excavations needed to retrofit hospital buildings under No Project Alternative A would be regulated by CBC and OSHPD 1 standards. The then-current City Building Code and possibly OSHPD 2 or OSHPD 3 would regulate those conditions for non-hospital buildings being retrofitted for human occupancy. Any soils and/or geologic materials used in the retrofitting to support the foundations of structures at the SUMC Sites would be required by the California or City Building Codes to be engineered to prevent liquefaction and to resist the lateral forces imposed by earthquakes or structural loads. Because the material strength of the soils or geologic units at the SUMC Sites were found to be moderate to high by previous geotechnical investigations, their potential for soil collapse is low. Flood proofing of any underground building levels would be required by the California or City Building Codes. Adherence to the grading requirements of these codes would ensure the maximum practicable stability of trenches and excavations for hospital and non-hospital structures on the SUMC Sites and would reduce the potential for geologic and soils instability to a less-than-significant level.

As described above, the regulatory environment providing protection from ground failures such as landslide, lateral spreading, subsidence, liquefaction, or collapse at the SUMC Sites for No Project Alternative A covers these soil characteristics and conditions. With oversight responsibility vested in OSHPD FDD for hospital buildings and in the City for non-hospital buildings, there would be a very low probability that any design feature approved by either agency would have other than a less-than-significant potential to expose people or property to on- or off-site landslide, lateral spreading, subsidence, liquefaction, or soil collapse.

As such, No Project Alternative A would have a less-than-significant potential to be located on a geologic units or on soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. Due to the hospital closures, this alternative would have less potetnail to expose persons or new structures to such hazards as compared to the SUMC Project. (LTS)

Cause Substantial Erosion or Siltation. Unlike for the SUMC Project, construction activities would not disturb more than one acre of land surface and no construction SWPPP would be required. However, the City's Municipal Code (Chapters 16.11 and 16.28, along with Section 16.28.120), and the City's Urban Runoff Management Plan to control erosion and sedimentation would continue to protect against substantial stormwater runoff and erosion under No Project Alternative A. In addition, No Project Alternative A could be subject to regulatory requirements for permanent stormwater pollution prevention measures, which would reduce the potential for erosion and sediment transport. Adherence to these requirements would prevent substantial erosion and sedimentation and would ensure potential impacts remained at a less-than-significant level.

With oversight responsibility vested in OSHPD FDD for hospital buildings and in the City for non-hospital buildings, there would be a very low probability that any design feature approved by either agency would have other than a less-than-significant potential to expose people or property to major geologic hazards. As such, No Project Alternative A would have a same less-than-significant potential to cause substantial erosion or siltation. Compared to the SUMC Project, this alternative would have less development (only retrofitting) and thus a lesser degree of impact. (LTS)

Cumulative Impacts. Soil and geologic conditions are site-specific and there is little, if any, cumulative relationship between the SUMC Sites and other areas in the City. As such, the potential for cumulative impacts to occur is geographically limited for many geology and soils impact analyses. No Project Alternative A would have approximately the same no-impact or less-than-significant potential as the SUMC Project to cause cumulatively substantial erosion or siltation. Consequently, cumulative impacts would be less than significant. (LTS)

Hydrology

Flood Risks and Flood Flows. The SUMC Sites are not in a 100-year flood hazard area; therefore, as with the SUMC Project, there would be no impact from No Project Alternative A regarding flood hazards and flood flows. (NI)

Groundwater Recharge and Local Water Table. No Project Alternative A would involve some excavation for utility routing, but excavations would not be as extensive as included in SUMC Project. No temporary groundwater dewatering would likely be needed compared to the SUMC Project. No Project Alternative A would have slightly more (one percent) impervious land surfaces compared to the SUMC Project because the SUMC Project would reduce impervious surfaces; however No Project

Alternative A would not increase the amount of impervious surfaces compared to existing conditions. Therefore, there would be no impact on groundwater recharge and the local water table. (NI)

Groundwater Quality. Unlike the SUMC Project, excavations for No Project Alternative A would not be substantial and there would be a sufficient depth of soil over the local groundwater table to protect groundwater from potentially infiltrating pollutants.[33] Unlike the SUMC Project, No Project Alternative A would not alter the groundwater plume hydrology on the Hoover Pavilion Site. Additionally, No Project Alternative A would be subject to similar regulatory requirements protecting groundwater quality as the SUMC Project. Consequently, unlike the SUMC Project, potential impacts of No Project Alternative A on groundwater quality would be less than significant without mitigation. (LTS)

Stormwater Runoff, Erosion, and Streambank Instability. Unlike for the SUMC Project, construction activities would not disturb more than one acre of land surface and no construction SWPPP would be required. However, the City's erosion and sediment control ordinance requirements would continue to protect against substantial stormwater runoff and erosion under No Project Alternative A. Like the SUMC Project, stormwater runoff during construction would not increase and there would be no effect on streambank instability. Operation of No Project Alternative A would result in slightly more impervious surfaces compared to the SUMC Project because the SUMC Project would have more green-roof area and about one percent less impervious land surfaces; however, there would be no increase compared to existing conditions. Additionally, because of the extensive retrofitting involved, No Project Alternative A could be subject to regulatory requirements for permanent stormwater pollution prevention measures, which would reduce the potential for erosion and sediment transport. Therefore, potential effects of construction and operation of No Project Alternative A on stormwater runoff, erosion, and streambank instability would be less than significant. (LTS)

Flooding and Stormwater Conveyance Capacity. No Project Alternative A would have a greater amount of total impervious surfaces than the SUMC Project; however, it would not increase the amount of impervious surfaces compared to existing conditions. Therefore, there would be no impact of No Project Alternative A on flooding and stormwater conveyance. (NI)

Degradation of Surface Water Quality. As with the SUMC Project, construction of No Project Alternative A would continue to be subject to existing City regulations to control pollutants in stormwater runoff both during construction and post-construction. However, unlike the SUMC Project, No Project Alternative A would not replace more than 50 percent of the SUMC Sites' impervious surfaces, and therefore, No Project Alternative A would not have to implement post-construction stormwater quality BMPs to treat runoff from the entire SUMC Sites. No Project Alternative A effects on degradation of surface water quality would not be substantially different than existing conditions and impacts would be less than significant. (LTS)

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[33] A water table distance separation of 10 feet depth in California presumptively poses negligible risk for storm water not associated with industrial activity or high vehicular traffic (SWRCB Attachment 4 to WQO-2003-0005-DWQ, p. 10, 2003)

Dam Failure Inundation. No Project Alternative A would result in no increase in the number of people potentially exposed to dam inundation from failure of the Searsville Dam and would be less than the SUMC Project. As such, there would be no impact of No Project Alternative A associated with dam failure inundation. (NI)

Violation of Any Water Quality Standards or Waste Discharge Requirements (WDRs). As mentioned above, No Project Alternative A would not cause or create conditions that could substantially affect water quality. As with the SUMC Project, No Project Alternative A would continue be subject to the same WDRs and water quality standards as the SUMC Project, except for any WDR associated with construction dewatering that might be necessary for the SUMC Project. Consequently, as with the SUMC Project, No Project Alternative A impacts regarding violation of WDRs or water quality standards or WDRs would be less than significant. (LTS)

Cumulative Impacts. As discussed in Section 3.11, Hydrology, cumulative impacts associated with current and future growth and development within the San Francisquito Creek watershed, surface runoff and erosion, flooding and stormwater conveyance capacity, streambank instability, degradation of surface water and groundwater quality, dam inundation, and violation of water quality standards and WDRs would be less than significant. Cumulative impacts within the Santa Clara Valley Groundwater Subbasin, on groundwater recharge, and on the local water table would be less than significant with existing regulations and management. (LTS)

Hazardous Materials

Exposure to Hazardous Materials During Construction. No Project Alternative A would consist of retrofitting and utility work; no new buildings would be constructed. Renovation activities under this alternative could expose construction workers and the public to potential toxic contaminants associated with building materials, such as asbestos containing materials (ACM). Asbestos poses health hazards only when inhaled; therefore, asbestos is potentially hazardous if not encapsulated. Additionally, building components containing PCBs, lead, and/or mercury could also be found in the buildings proposed to be renovated under this alternative. Exposure to these materials during renovation could be considered a significant impact, similar to the SUMC Project. Federal, State, and local regulations have established standards that provide maximum safe exposure levels and specify precautions and safe work practices in order to minimize the potential release of these contaminants. In addition, the following mitigation measure, which is identified in Section 3.12, would reduce the significant construction impacts associated with asbestos to a less-than-significant level. (S/LTS)

- HM-2.1: Conduct Asbestos Survey at the SUMC Sites

No Project Alternative A would avoid major excavations and construction on potentially contaminated sites, thereby avoiding the significant impact associated with construction activities and exposure to workers and the public from existing soil and groundwater contamination as identified for the SUMC Project. Therefore, a less-than-significant impact would occur related to disturbing contaminated soil or groundwater. (LTS)

Exposure to Hazardous Materials During Operation. Day-to-day use, handling, and disposal of hazardous materials (operational uses) would continue from pre-project conditions at the SUMC Sites. The proposed renovation and retrofits would not increase additional uses and/or handling of hazardous materials compared to existing conditions. All uses, handling, and disposal of hazardous materials are highly regulated under existing federal, State, and local regulations. As such, compliance with all regulations would ensure that impacts associated with exposure to hazardous materials during operation activities under No Project Alternative A remain less than significant, as with the SUMC Project. (LTS)

Safety Hazards to Schools. Like the SUMC Project, this alternative would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. No existing K-12 schools are located within one-quarter mile of the location of the No Project Alternative A.

The LPCH includes an on-site school within the facility. The No Project Alternative A would consist of retrofitting and utility work; no new buildings would be constructed. The new retrofitting activities could have the potential of increasing the amount of hazardous materials used on-site. Similarly to the SUMC Project, the No Project Alternative A would be subject to regulation and operation practices that minimize hazard risks and would ensure that associated risks are not substantially increased. As such, impacts associated with hazardous emissions within one-quarter mile of an existing or proposed school, including the on-site school locate within the LPCH facility would be less than significant. (LTS)

Wildfire Risk. Similar to the SUMC Project, No Project Alternative A would be located in a flat, urbanized area, outside of the fire hazard zone, as identified by the Comprehensive Plan and the City of Palo Alto Emergency Operations Plan.[34] Therefore, the site is not in an area susceptible to significant grass, brush, or tree fires. Consequently, this alternative would not pose a significant impact with regard to wildfire hazard. No impacts would occur. (NI)

Safety Hazard from Public Airports. As described under the SUMC Project, the No Project Alternative A would not be located within the jurisdiction of any Airport Land Use Plan (ALUP) or within 2 miles of a public airport. Additionally, No Project Alternative A would not result in a safety hazard from a public airport because it would not place workers and/or residents near a public airport. No impacts would occur. (NI)

Emergency Response or Evacuation Plans. No Project Alternative A would not involve major construction and there would be virtually no changes to the level of construction traffic entering or exiting the SUMC Sites. Therefore, construction traffic would not significantly interfere with emergency access along designated evacuation routes, and lane closures in the vicinity of the SUMC Sites would most likely not occur. In addition, No Project Alternative A would not increase occupancy, employment, or other on-site activities over existing conditions. As such, trip generation would not increase and existing emergency response times and evacuation routes would not be affected.

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34 City of Palo Alto, Emergency Operations Plan, June 2007.

Unlike the SUMC Project, which would result in significant impacts, No Project Alternative A would have a less-than-significant impact to emergency response time and evacuation plans. (LTS)

Cumulative Impacts. As discussed in Section 3.12, Hazardous Materials, cumulative would increase the use, storage, and handling of hazardous materials within the SUMC Sites and adjacent areas and also could increase risk of exposure at schools within a quarter mile of the SUMC Sites. However, these activities would be subject to laws and regulations pertaining to the handling, storage, and disposal of hazardous materials as described in Section 3.12. As such, cumulative impacts related to hazardous materials use, storage, and handling would be less than significant under both this alternative and the SUMC Project. With both the SUMC Project and this alternative, there would be no cumulative impacts related to construction of schools on contaminated property, hazards from wildland fires, or airport operations.

This alternative would not involve new construction or excavation and would thus have no potential to contribute to cumulative disturbance of contaminated soils. However, this alternative could expose workers to contaminants associated with building materials, such as asbestos. The 777 Welch Road project, almost adjacent to the SUMC Sites, would also potentially release contaminants associated with building materials. That project and this alternative could result in significant cumulative impacts. The contribution of No Project Alternative A would be considerable given the extent of retrofitting involved. However, Mitigation Measure HM-2.1, involving measures to reduce exposure of persons to hazardous materials (such as asbestos), would reduce No Project Alternative A's to a less than cumulatively considerable level. (S/LTS)

Population and Housing

Population Increases. The daytime population associated with employment and visitorship would not increase under No Project Alternative A, relative to existing conditions. By 2030, either the SHC or the LPCH hospital would likely close, with the remaining hospital occupying any OSHPD compliant space vacated by the hospital that would close. As no net increase in employment would occur, there would be no impact with respect to direct employment and increases in visitor population. In addition, there would be no impact with respect to indirect population increases associated with an elevated demand for new housing units. (NI)

Displacement of Housing. Similar to the SUMC Project, this alternative would have no impact on the displacement of existing housing as no housing exists on the SUMC Sites. (NI)

Jobs to Employed Residents Ratio. The jobs to employed residents ratio impact is not, by itself, considered an environmental impact; however, it is analyzed because this impact could have the potential to result in secondary environmental impacts on air quality and climate change. Nonetheless, No Project Alternative A would not increase the number of jobs on the site and no housing exists on the SUMC Sites. Therefore, this alternative would not exacerbate imbalances in the jobs to employed residents ratio and would not displace existing housing.

Cumulative Impacts. No Project Alternative A would not increase the number of jobs or alter the number of housing units on the SUMC Site. Therefore, in combination with existing and reasonably foreseeable probable future development, No Project Alternative A would result in no cumulative impact. (NI)

Public Services

Demand for Services. Under No Project Alternative A, the occupancy and number of employees on the SUMC Sites would not increase. As with the SUMC Project, no residents would be introduced to the SUMC Sites. Because there would be no increase to the on-site population, there would not be a greater demand or utilization of the City's public services than currently exists. As a result, No Project Alterative A would result in a less severe impact compared to the SUMC Project, and would have no impact on the City's public services. Because the No Project Alternative A would not result in any impacts to the provision of public services, it would have no potential to contribute to a cumulative impact regarding public services.

In addition, it should be noted that one of the SUMC Project's objectives is to meet existing and projected future demand for patient care. This includes increasing the size of the ED to provide adequate patient waiting and triage space, and the construction of trauma rooms consistent with contemporary facility standards.[35] This would not occur under the No Project Alternative A, and thus, would result in inadequate healthcare services for the City of Palo Alto. (NI)

Utilities

Project-Related Demand for Utilities. No Project Alternative A would not change the existing floor space or use at the SUMC Sites, and would therefore have similar water, sewer, electrical, gas, and operational solid waste demands as the current facility. Therefore, it would not result in an increase in utility demand or the need for new or expanded facilities and there would be no impact. (NI)

Cumulative Impacts. Because the No Project Alternative A would not result in any impacts to the provision of utilities, it would have no potential to contribute to a cumulative impact regarding utility facilities. (NI)

No Project Alternative B: Replace SB 1953 Noncompliant Structures at Maximum Allowable FAR

Land Use

Conflicts with Applicable Land Use Designations and Zoning. Under No Project Alternative B, seismically unsound structures would be demolished and rebuilt to the maximum size allowed under existing development regulations. No land use changes would occur and a small, approximately 9,000-

[35] A description of the existing demand for healthcare and the current deficit of available space to accommodate those demands is presented in Section 2.5, under the "Spatial Constraints" heading.

square-foot increase in hospital space is anticipated. Unlike the SUMC Project, this alternative would not require a Comprehensive Plan Amendment or rezoning and would not conflict with applicable development regulations and no impact would occur. By comparison, the SUMC Project's impacts would be less than significant. (NI)

Conflicts with Comprehensive Plan Policies. With mitigation, no Comprehensive Plan policy conflicts were determined for the SUMC Project. By constructing a demolishing and replacing structures that are noncompliant with SB 1953, this alternative would also require mitigation to ensure compliance with Comprehensive Plan policies that protect visual quality, historical resources, urban forest resources, groundwater and stormwater runoff, air quality degradation, and noise incompatibility. However, unlike the SUMC Project, No Project Alternative B would result in one significant policy conflict with Policy L-7, which requires new development to address regional needs and overall City welfare and objectives. Although additional floor area would be added, the hospitals' combined daily capacity for inpatients would be reduced by up to 285 patients. By failing to meet local and regional demand for medical services, this alternative would not be consistent with Policy L-7, a significant and unavoidable impact. (S/SU)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations
- CR-1.2: Prepare HABS Documentation for the Stone Building Complex
- CR-1.3: Prepare and Distribute Written and Photographic Documentation to Agencies
- CR-1.4: Prepare Permanent Interpretive Displays/Signage/Plaques
- AQ-1.1: Implement Recommended Dust Control Measures
- AQ-1.2: Implement Diesel Emission Reduction Measures
- NO-1.1: Implement Best Management Practices to Reduce Construction Noise
- NO-4.1: Shield or Enclose HVAC Equipment and Emergency Generators
- BR-4.1: Prepare a Tree Preservation Report for all Trees to be Retained
- BR-4.2: Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks
- BR-4.3: Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention
- BR-4.4: Provide a Tree Preservation Bond/Security Guarantee
- BR-4.5: Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category
- HW-3.1: Develop Workplan for any Unknown Contaminated Sites
- *No Net Increase in Runoff* (New mitigation measure not identified for the SUMC Project; see Hydrology analysis for this alternative.)

Compatibility with Adjacent Land Use Character and Conflicts with Established Residential, Recreational, Educational, Religious, or Scientific Uses in the Area. Although development on the SUMC Sites would be slightly more intense than under current conditions, No Project Alternative B would not introduce a new land use that would conflict with existing uses. The level of development proposed would not substantially exceed existing conditions. Therefore, no impact would occur, as with the SUMC Project. (NI)

Division of an Established Community, and Farmland Conversion. The SUMC Project would have no impact on the division of an established community or farmland conversion. Similarly, No Project Alternative B would not add physical barriers that might result in restriction of customary circulation patterns or a disruption of land use connectivity, nor would it require the acquisition and development of lands currently used for agricultural purposes. As such, no impact would occur. (NI)

Adverse Changes to Existing or Planned Land Use Pattern. No Project Alternative B would involve a slight intensification of land uses; however, these uses would conform to existing development regulations. Therefore, this alternative would not interfere with implementation of existing plans and policies or significantly alter the type or intensity of existing land uses within the Project Vicinity. Unlike the SUMC Project, no impact would occur under this alternative. (NI)

Cumulative Impacts. This alternative, in combination with other reasonably foreseeable probable future development in the area, would have no cumulative impact on overall existing or planned land uses in the vicinity of the SUMC Sites. Similarly, the SUMC Project would not contribute to a cumulative land use conflict. (NI)

Visual Quality

Temporary Degradation of Visual Quality. Similar to the SUMC Project, there would be temporary but adverse visual impacts during the construction stage of No Project Alternative B. These impacts would result from the demolition of existing buildings, the construction of new structures, and from equipment staging. In addition, there would be a period when both the existing and the new buildings would be erect and operable, creating a crowded appearance. Therefore, as with the SUMC Project, the temporary construction phase of No Project Alternative B would result in a significant visual impact. However, the following mitigation measure, as presented for the SUMC Project, would reduce phased construction impacts to less than significant. (S/LTS)

- VQ-1.1: Implement Construction Visual Improvement Plan

Permanent Degradation of Visual Character Post Construction. No Project Alternative B would have less-than-significant impacts on on-site visual character in the context of surrounding development. Although there would be increased massing of approximately 9,000 square feet compared with existing conditions, this expansion would be small and would not substantially alter existing aesthetic conditions. In addition, a substantial net area increase of open space would be added under No Project Alternative B compared to existing conditions and the SUMC Project. However, exterior bracing would be installed at the SoM portion of the 1959 Hospital Building complex. The exterior bracing could alter the visual quality of the Main SUMC Site, but not to a significant degree. Therefore, No Project Alternative B would reduce building mass compared to the SUMC Project, would add open space, and most likely would not conflict with the surrounding visual character. In addition, as outlined by the below mitigation measure, the City's Architectural Review process would be required for this alternative and would further reduce the already less-than significant impacts on the visual character within and surrounding the SUMC Sites. As such, No Project Alternative B impacts would be less than significant. (LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Alteration of Public Viewsheds, View Corridors, or Scenic Roads. The proposed hospital and medical office structures under No Project Alternative B would not substantially obstruct views of foothills from public streets, open spaces, and common residential areas that are within the line of sight of No Project Alternative B structures. Since post-construction floor area under No Project Alternative B would be 1,791,162 square feet less than the SUMC Project, impacts to views would be significantly less. In addition, since the construction would be limited to the SHC portion of the Main SUMC Site, views at the LPCH and Hoover Pavilion Site would not be impacted. The City's Architectural Review process, as mandated by the below mitigation measure, would further ensure that the alternative would have less-than-significant impacts on the visual character within and surrounding the SUMC Sites. (LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Terrain Modification. Since the SUMC Sites are relatively flat, No Project Alternative B would have no impact on terrain modifications, like the SUMC Project. (NI)

New Sources of Light and Glare. No Project Alternative B, similar to the SUMC Project, would create a new source of light and glare especially by constructing a hospital building near Welch Road residences. Like the SUMC Project, this alternative would be required to adhere to Section 18.23.030 of the Municipal Code, which precludes significant glare and off-site spillage. In addition, No Project Alternative B would undergo Architectural Review by the City, as required by Mitigation Measure VQ-2.1. Therefore, light and glare impacts under No Project Alternative B would be less than significant with mitigation, as with the SUMC Project. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Shadowing Public Open Spaces. Although new shadows would be cast under No Project Alternative B, there would be significantly fewer shadows than under the SUMC Project because of the decrease in massing. Due to the reduced amount of square footage under this alternative compared to the SUMC Project, it is assumed that No Project Alternative B would be able to stay within the 50-foot height limit, and thereby would cast fewer shadows. In addition, the new shadows would not be cast over public open spaces; therefore No Project Alternative B would result in a less-than-significant impact, as with the SUMC Project. (LTS)

Cumulative Impacts. As discussed in Section 3.3, Visual Quality, cumulative impacts associated with visual character, sensitive views, light and glare, and shadowing would be less than significant. As less development would occur under No Project Alternative B, cumulative impacts would remain less than significant. All cumulative development would be required to undergo Architectural Review by the City and adhere to Section 18.23.030 of the Municipal Code. (LTS)

Transportation

Under No Project Alternative B, approximately 665,000 square feet of existing building space would be demolished and replaced with approximately 674,000 square feet of new building space. As a result, there would be an increase of approximately 9,000 square feet of building space; however there would be a decrease in hospital beds. Additionally, Parking Structure 3 would be replaced with a new underground structure at Welch Road and Pasteur Drive.

Construction Impacts. During the demolition and construction phase, it is anticipated that traffic impacts would be primarily due to construction worker trips, the movement of heavy equipment that would be used for demolition and construction to and from the site, as well as material hauling. Although construction plans are not available at this time, it is anticipated that the work would occur over several years, and be completed by 2015. The total number of construction related trips would vary from year to year depending on the type and intensity of construction work being performed. Regardless, the arrival and departure times for construction workers would primarily occur during off-peak hours, typically arriving before 7:00 a.m. and leaving before 4:00 p.m. The movement of heavy construction equipment such as cranes, bulldozers, and dump trucks to and from the site would also be scheduled, where possible, to occur during off-peak hours. However, there is the potential for conflicts between construction related traffic and traffic on the surrounding roadway network. With implementation of the following mitigation measures the significant construction related traffic impacts would be reduced to less-than-significant levels. (S/LTS)

- TR-1.1: Provide Off-Street Parking for Construction Related Vehicles
- TR-1.2: Maintain Pedestrian Access
- TR-1.3: Maintain Bicycle Access
- TR-1.4: Restrict Construction Hour
- TR-1.5: Restrict Construction Truck Routes
- TR-1.6: Protect Public Roadways During Construction
- TR-1.7: Maintain Public Transit Access and Routes
- TR-1.8: Prepare and Implement Construction Impact Mitigation Plan
- TR-1.9: Conduct Additional Measures During Special Events

Operational Impacts. Upon completion of the construction of the new buildings and parking structure, the level of traffic entering and exiting the Main SUMC Site would be reduced from existing conditions due to the reduction in the number of hospital beds. Therefore, unlike the SUMC Project, this alternative would have no adverse traffic impact on intersections or freeway level of service, residential roadways, parking, transit, bicycle and pedestrian access, and emergency vehicle access. (NI)

Cumulative Construction Impacts. As with the SUMC Project analysis, the operational analysis of this alternative captures both project-level and cumulative-level impacts. Construction traffic from this alternative and other foreseeable and concurrent construction could utilize the same routes and have a significant cumulative construction-period impact. As with the SUMC Project, due to the large scale of construction under this alternative, the contribution to the cumulative impact would be considerable.

However, as with the SUMC Project, Mitigation Measure TR-1.1 through TR-1.9 would reduce the contribution of this alternative to less than considerable. (S/LTS)

Air Quality

Construction Criteria Air Pollutant Emissions. Under No Project Alternative B, there would be construction emissions associated with the replacement of SB 1953 noncompliant structures. The intensity and duration of construction activities could be less than that of the SUMC Project; however, depending on how the construction activities are phased and the intensity of each phase the No Project Alternative B could still result in a significant daily emission of NO_x, similar to the SUMC Project. This alternative would emit significant construction dust, like the SUMC Project. This alternative would emit significant construction dust, like the SUMC Project. This alternative would require the implementation of standard BAAQMD control measures for fugitive dust and diesel emissions, similar to the SUMC Project. Mitigation measures would reduce construction dust impacts to less-than-significant levels, but could remain significant and unavoidable for NO_x emissions. (S/SU)

- AQ-1.1: Implement Recommended Dust Control Measures
- AQ-1.2: Implement Diesel Emission Reduction Measures

Operational Criteria Air Pollutant Emissions. No Project Alternative B would replace SB 1953 noncompliant structures with compliant structures of with slightly larger total floor area; however, it would also reduce the number of beds compared to existing conditions. Therefore, its operational emissions of criteria pollutants after the new structures are complete would be lower than existing. This alternative would thus have no impacts associated with emissions of criteria pollutants during operation. Similar to the SUMC Project, this alternative would include moving 700 of the current parking spaces into a new underground structure at the corner of Welch Road and Pasteur Drive. However, since localized CO concentrations near major vehicular access routes and in parking garages associated with the SUMC Project were not found to exceed ambient standards, the No Project Alternative B CO impacts would also be less than significant. (LTS)

Construction and Operational TACs. The SUMC Project Health Risk Assessment evaluated TAC emissions from construction equipment and new operational sources (i.e., emergency diesel generators, delivery trucks, and additional medical helicopter flights/heliport) and found the associated health impacts to be less than significant. Under No Project Alternative B, construction-phase TAC emissions would be lower because the use of diesel-powered construction equipment would be less than would be required for the SUMC Project. The operational sources of TACs associated with the No Project Alternative B (i.e., the diesel generators, truck loading docks and heliport) would likely result in less emissions than those evaluated in the SUMC Project Health Risk Assessment, since No Project Alternative B would result in less floor area than the SUMC Project. Thus, construction and operational TAC impacts would be less than significant. (LTS)

Cumulative Impacts. The SUMC Project's emissions of NO_x during construction and of TACs during construction and operation were identified as making cumulatively considerable contributions to significant cumulative impacts. Under No Project Alternative B**,** emissions of NO_x during construction would also potentially exceed the BAAQMD's 80 lbs/day threshold, and could contribute to significant cumulative impacts. The TACs emitted during construction and operation, though likely posing a lesser heath risk than those of the SUMC Project, would also make a cumulatively considerable contribution to the high TAC background levels of the area in which the SUMC Sites are located. Consequently, this alternative's cumulative TAC impacts would be cumulatively significant. The same construction-period mitigation measure mentioned above would help reduce TAC emission from this alternative, but not to a less than considerable level. Consequently, this alternative's construction NO_x emissions and cumulative TAC impacts would be cumulatively significant. (S/SU)

Climate Change

Consistency with the Climate Protection Plan. As with the SUMC Project, several structures would be fully or partially demolished under this alternative and would be replaced by new structures. No Project Alternative B would therefore generate greenhouse gases during construction. Although the BAAQMD is not introducing greenhouse gas thresholds for construction activities, renovation activities would be required to comply with all applicable BAAQMD recommended greenhouse gas reduction measures in order to be considered less than significant.

No Project Alternative B would include a slight, approximately 9,000-square-foot increase in floor area; approximately 0.7 percent of the net floor area increase anticipated under the SUMC Project. No Project Alternative B includes replacing the demolished buildings. These newer buildings would be required to comply with current Title 24 standards, which would make those buildings more efficient, using less electricity, natural gas and water than similar operations occurring in the original buildings. Further, the upgrading of facilities to meet with right-sizing would result in a decrease of up to 285 beds, decreasing the operational activities of the hospital. The net increase in floor space would be overshadowed by the increased efficiency of the new buildings replacing the old one, the decrease in bed space and operational activity, resulting in a potential net decrease in greenhouse gas emissions from existing conditions.

AB 32, the CARB Scoping Plan, incorporates a 30 percent reduction target from 2020 BAU emissions limits. The City's Climate Protection Plan's incorporates this BAU approach to quantify emissions from significant, new projects which were not included in the City's existing inventory. As such, this analysis applies the 2020 reduction goal (equivalent to 30 percent below BAU) as a target threshold for compliance with the City Climate Protection Plan. Since No Project Alternative B would result in the reduction of bed space and would not include the programs or design features (other than compliance with Title 24) stipulated with the SUMC Project the resulting emissions from project operations would result in the same as or reduction in emissions from existing conditions. No Project Alternative B would not emit any additional greenhouse gases than it currently is, therefore, No Project Alternative B would have a less-than-significant impact with respect to the Climate Protection Plan. (LTS)

Result in Significant Emissions of Greenhouse Gases. No Project Alternative B provides energy efficiency increases and has a potential decrease of operational capacity by up to 285 beds. This increase in efficiency coupled with the reduction in operational capacity would not result in greenhouse gas emissions greater than those currently existing and may result in an overall decrease in emissions. Because of the static or potential limited decrease in emissions. Impacts from No Project Alternative B would be associated with construction would be less than cumulatively considerable. (LTS)

Noise

Construction Impacts. Under No Project Alternative B, the types of construction activities would be similar to the SUMC Project, but the amount and duration of construction could be less. Nonetheless, impacts under this alternative would still be significant for on-site receptors. Mitigation Measure NO-1.1 would be required, but would not reduce construction noise impacts on on-site receptors to less than significant, as with the SUMC Project. (S/SU)

- NO-1.1: Implement Best Management Practices to Reduce Construction Noise

Operational Impacts. Operational noise from on-site HVAC equipment and emergency generators would be similar to that from the SUMC Project, since the hospital building would be constructed in the same location. Impacts from HVAC and emergency generators would be mitigated to less-than-significant levels with implementation of the following mitigation measure, as presented for the SUMC Project. No Project Alternative B would not generate any new noise impacts associated with motor vehicle traffic. However, relocation of the ED under this alternative would add a major ambulance access route along Sand Hill Road with consequent significant unavoidable noise impacts to residential uses along Sand Hill Road between El Camino Real and Durand Way, similar to the SUMC Project. This alternative would not worsen noise impacts associated with truck loading/parking facility activities, and medical helicopters using the new heliport. (S/SU)

- NO-4.1: Shield or Enclose HVAC Equipment and Emergency Generators

Cumulative Impacts. Cumulative noise impacts would be similar under this alternative and the SUMC Project. As with the SUMC Project, there would be significant cumulative construction noise with this alternative, both on site and off site. Mitigation Measure NO-1.1 would be warranted but would not reduce the contribution if this alternative to less than considerable. This alternative would result in significant and unavoidable construction noise impacts. Also, there would be no significant cumulative vibration impacts with the SUMC Project as well as this alternative. No other foreseeable project would generate ambulance noise and so there would no cumulative impacts from ambulance noise. (S/SU)

Cultural Resources

Impacts on the Stone Building Complex. While the SUMC Project would demolish the Stone Building complex, No Project Alternative B would demolish just the Boswell, Core, East, and West Buildings, and the 1973 Core Expansion Building. No Project Alternative B would retain the SoM portion of the Stone Building complex (the Grant, Alway, Lane, and Edwards Buildings). These portions would be seismically retrofitted (similar to the bracing work on the entire Stone Building Complex under No Project Alternative A). The exterior bracing needed to seismically retrofit the building for this alternative could significantly alter or obscure the character-defining features of the buildings. The Boswell, Core, East, and West Buildings represent a significant portion of the Stone Building complex. Therefore, even without the proposed retrofitting to the remaining portion, the Stone Building complex would become ineligible for listing on the CRHR after the demolition of the above buildings. It is anticipated that even with the implementation of the proposed mitigation measures for No Project Alternative B, the impacts would remain significant and unavoidable due to the partial demolition of the Stone Building complex and the addition of seismic retrofitting.

Overall, with mitigation, this alternative would have significant unavoidable impacts due to the demolition of the Boswell, Core, East, and West Buildings, and the 1973 Core Expansion Building portions of the Stone Building complex. (S/SU)

- CR-1.2: Prepare HABS Documentation for the Stone Building Complex
- CR-1.3: Prepare and Distribute Written and Photographic Documentation to Agencies
- CR-1.4: Prepare Permanent Interpretive Displays/Signage/Plaques

Impacts on the Hoover Pavilion. Under No Project Alternative B, no work at the Hoover Pavilion Site would occur and the existing buildings and storage sheds on the site would be preserved. In addition, the proposed medical office building and the parking structure would not be built. Therefore, there would be no construction vibration that could damage the Hoover Pavilion building and no new buildings would be added that would block views of the historic site. Therefore, No Project Alternative B would have no impact on the Hoover Pavilion. (NI)

Impacts on Archaeological Resources and Human Remains. As with the SUMC Project, No Project Alternative B would be outside of the zone where there are dense archaeological remains, and prehistoric cultural resources have not been encountered in this area. In addition, no human remains have been encountered within the boundaries of the SUMC Sites. As with the SUMC Project, it is possible, although unlikely, that archaeological resources and human remains could be encountered during No Project Alternative B's ground-disturbing activities. The following mitigation measures, which are presented for the SUMC Project, would ensure that the impact remains less than significant. (S/LTS)

- CR-2.1: Construction Staff Training and Consultation
- CR-3.1: Conduct Protocol and Procedures for Encountering Human Remains

Impacts on Paleontological Resources. As with the SUMC Project, disturbance of any paleontological resources is a significant impact; however, the following mitigation measure, as identified for the SUMC Project, would reduce the impact to less than significant. (S/LTS)

- CR-4.1: Conduct Protocol and Procedures for Encountering Paleontological Resources

Cumulative Impacts. Cumulative impacts on archaeological and paleontological resources and human remains from this alternative and adjacent development could be significant due to potential presence of these resources in the area. As with the SUMC Project, this analysis conservatively finds that this alternative would have a cumulatively considerable contribution to the cumulative impact. Mitigation measures described above would ensure that this alternative's contribution would be less than cumulatively considerable.

Although this alternative would retain a portion of the Stone Building complex, the necessary changes to retrofit the building and partial demolition of the Stone Building Complex could significantly and adversely alter the building such that it would no longer be eligible to the CRHR. As discussed in Section 3.8, Cultural Resources, cumulative development has had a pre-existing significant cumulative impact on other E.D. Stone structures in Palo Alto. Like the SUMC Project, No Project Alternative B would have a cumulatively considerable contribution to the cumulative impact by demolishing the Stone Building complex at the Main SUMC Site. Mitigation such as Mitigation Measures CR-1.2 through CR-1.4, involving documentation and protective measures, would reduce the impact on historic resources; however, the loss of the Stone Building complex would remain a cumulatively considerable contribution to the cumulative impact. (S/SU)

Biological Resources

Special Status Plant or Wildlife Resources. As described for the SUMC Project, habitat on-site capable of supporting special-status plants or wildlife is limited to roosting habitat for special-status bats and Cooper's hawk. However, buildings in the SUMC area could provide roosting habitat for special-status bat species known from the region, and trees in the SUMC area could provide nesting habitat for Cooper's hawk. Removal of trees containing Cooper's hawk nests, or removal of, or modification to, buildings containing active bat roosts could result in the loss of Cooper's hawk or their active nests, or individual bats, bat colonies, or their habitat. No Project Alternative B would remove structures at the Main SUMC Site; therefore, implementation of No Project Alternative B could have a significant impact on protected bat species, similar to the SUMC Project. However, this would be less of an impact than the SUMC Project because no structures would be removed at the Hoover Pavilion Site. The following mitigation measure, as presented in Section 3.9, Biological Resources, would reduce No Project Alternative B's impact on special-status and protected bats to a less-than-significant level. (S/LTS)

- BR-1.1: Conduct Pre-Demolition Survey
- BR-1.2: Avoid Roosting Areas
- BR-1.3: Develop and Employ Bat Nest Box Plan
- BR-1.4: Avoid Tree Removal During Nesting Season
- BR-1.5: Protect Cooper's Hawk in the Event of Nest Discovery

Loss of Riparian or Other Sensitive Habitats. The SUMC Project would have a less-than-significant impact on riparian habitats. During the temporary construction period of No Project Alternative B, the existing and the replacement medical facilities would be in place concurrently in order for the SHC Hospital to continue to operate. As such, there would be an increase in impervious area, which would increase the rate, volume, or duration of run-off flow, causing bed and bank erosion or sedimentation of San Francisquito Creek, similar to the condition under the SUMC Project. However, due to the distance from the creek, and its separation from it by existing hardscapes and Sand Hill Road, it is unlikely that surface runoff or sedimentation from construction under No Project Alternative B could reach the creek in a substantial enough quantity to affect riparian vegetation, or cause fill of the channel within San Francisquito Creek. Additionally, mitigation measures and Best Management Practices (BMPs) detailed in Section 3.11, Hydrology, would further reduce the potential for loss of riparian or wetland habitats due to sedimentation and erosion. Therefore, the impact of No Project Alternative B on the riparian habitat of San Francisquito Creek would be less than significant. (LTS)

Interference with Species Movement, Wildlife Corridors, or Nursery Sites. Similar to the SUMC Project, No Project Alternative B would require modifications to existing structures, and the removal of on-site trees, which could be used by migratory birds as nursery sites, including birds that nest on buildings (i.e., swallows, phoebes, etc.). However, the removal of trees, or nests on buildings would occur to a lesser degree than the SUMC Project since No Project Alternative B would include significantly less square feet. Nonetheless, No Project Alternative B could result in a significant impact on migratory bird nests. The following mitigation measures, recommended for the SUMC Project in the Biological Resources Section, would reduce the impact to less than significant. (S/LTS)

- BR-3.1: Avoid Tree Removals or Building Demolition During Nesting Season
- BR-3.2: Protect Birds in the Event of Nest Discovery

Impacts on Protected Trees. Implementation of No Project Alternative B would impact Protected Trees during preparation for building construction and would result in the loss of Protected Trees due to damage sustained during the construction phase. Since No Project Alternative B would require a smaller building footprint than the SUMC Project and would not construct new buildings at Kaplan Lawn and the FIM 1 grove, this alternative would have less of an impact on Protected Trees. Nonetheless, No Project Alternative B would still result in a significant impact. The following mitigation measures, as identified for the SUMC Project, would reduce this alternative's impact on Protected. However, these mitigation measures would not be able to avoid and preserve all Protected Trees; therefore, No Project Alternative B would result in a significant and unavoidable impact. (S/SU)

- BR-4.1: Prepare a Tree Preservation Report for all Trees to be Retained
- BR-4.2: Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks
- BR-4.3: Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention
- BR-4.4: Provide a Tree Preservation Bond/Security Guarantee
- BR-4.5: Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category

Conflicts with an HCP or NCCP. The Santa Clara Valley HCP is the nearest adopted HCP/NCCP in the region, but the SUMC Sites are not included within its boundaries. The Stanford University HCP is currently out for public review and has not been adopted. As such, similar to the SUMC Project, No Project Alternative B would have no impact on an applicable HCP or natural communities conservation plan. (NI)

Cumulative Impacts. Cumulative development of past, current, and reasonably foreseeable probable future development, could negatively impact special-status bats, Cooper's hawk, and migratory birds, thus resulting in a significant cumulative impact on these resources. However, the size of disturbance within No Project Alternative B is smaller than the SUMC Project. No Project Alternative B's contribution to regional loss of urban habitat would be less than with the SUMC Project. Therefore, as with the SUMC Project, with implementation of Mitigation Measures BR-1.1 to BR-1.3 for special-status bats, and Mitigation Measures BR-1.4 and BR-1.5 for Cooper's hawk, No Project Alternative B's contribution to the regional loss of urban habitat for special-status bats and Cooper's hawk would be less than cumulatively considerable. Similar to the SUMC Project, even with implementation of mitigation measures discussed above, the contribution of No Project Alternative B to the cumulative loss of Protected Trees would be cumulatively considerable. (S/SU)

Geology, Soils, and Seismicity

Exposure to Seismic-Related Hazards. No Project Alternative B would have a less-than-significant potential to expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground-shaking, seismic-related ground failure (including liquefaction), landslides, or expansive soil. (LTS)

Exposure to Other Geotechnical Hazards. No Project Alternative B would have a less-than-significant potential to be located on a geologic units or on soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. Due to the reduction in beds, this alternative would have less potential to expose persons or new structures to such hazards compared to the SUMC Project. (LTS)

Cause Substantial Erosion or Siltation. No Project Alternative B would have a less-than-significant potential to cause substantial erosion or siltation. Compared to the SUMC Project, this alternative would have less new development and a lesser degree of impact. (LTS)

Cumulative Impacts. Soil and geologic conditions are site-specific and there is little, if any, cumulative relationship between the SUMC Sites and other areas in the City. As such, the potential for cumulative impacts to occur is geographically limited for many geology and soils impact analyses. No Project Alternative B would have a less-than-significant potential as the SUMC Project to cause cumulatively substantial erosion or siltation. Construction and operational activities embodied in No Project Alternative B would be subject to the same regulation as the SUMC Project. Consequently, this alternative would not contribute to cumulative effects related to geology, soils, or seismicity. Cumulative impacts would be less than significant. (LTS)

Hydrology

Flood Risks and Flood Flows. The SUMC Sites are not in a 100-year flood hazard area and therefore, as with the SUMC Project, there would be no impact from No Project Alternative B regarding flood hazards and flood flows. (NI)

Groundwater Recharge and Local Water Table. As with the SUMC Project, no new groundwater supply wells would be implemented under No Project Alternative B. If the new parking structure and/or replacement building is below or partially below ground surface, temporary groundwater dewatering may be required during construction, similar to the SUMC Project. Effects of temporary groundwater dewatering during construction would be less than or similar to the SUMC Project. As with the SUMC Project, there would be no permanent groundwater dewatering and No Project Alternative B impact on direct lowering of the water table level would be less than significant.

With No Project Alternative B, existing parking in Parking Structure 3 would be replaced in a new parking structure which could permanently create substantial additional impervious surfaces on the Main SUMC Site, if the demolished structures are not replaced with pervious surfaces and depending upon the new parking structure footprint. As explained in Section 3.11, Hydrology, the SUMC Sites are not in a significant groundwater recharge area and a confining layer separates the surface water table groundwater from the deep groundwater aquifer in the vicinity. Consequently, No Project Alternative B could reduce the potential for groundwater recharge compared to the SUMC Project and existing conditions; however, impacts would remain less than significant. (LTS)

Groundwater Quality. Unlike the SUMC Project, there would be no impact from No Project Alternative B construction activities on pollutant plume hydrology and it would not contribute to plume movement at the Hoover Pavilion Site because there would be no excavation on the Hoover Pavilion Site. As with the SUMC Project, during construction of No Project Alternative B, pervious surfaces in excavated pits could be exposed to rainfall and runoff waters carrying pollutants or contain historic pollutants that can migrate to groundwater with infiltrating rain and runoff waters. A SWPPP and compliance with Municipal Code Section 16.09.117 would be required. These existing regulations would prevent the substantial introduction of pollutants into infiltrating water during construction of No Project Alternative B. However, as with the SUMC Project, the exposure of unknown contaminated soils could be a significant impact. The following mitigation measure, as identified for the SUMC Project, would reduce No Project Alternative B's impact on groundwater quality to a less-than-significant level. (S/LTS)

- HW-3.1: Develop Workplan for any Unknown Contaminated Sites

Stormwater Runoff and Erosion and Streambank Instability. Construction of No Project Alternative B would include construction activities similar to the SUMC Project, which could lead to increased on-site erosion and off-site sediment transport. However, as with the SUMC Project, No Project Alternative B would be subject to existing regulations for erosion and sediment controls that would prevent substantial on-site erosion and off-site sediment transport. Therefore, similar to the

SUMC Project, No Project Alternative B impacts on on-site erosion and off-site sediment transport would be less than significant.

As explained in Section 3.11, Hydrology, the Santa Clara Municipal Regional Permit Hydromodification Management (HM) Standard set limitations on increases in peak stormwater runoff rate and volume in areas where increased impervious surfaces could contribute to stream bed or bank erosion. HM controls include such site design techniques as reducing impervious surface area, promoting infiltration and evapotranspiration, and introducing alternative site design concepts (e.g., green roofs, on-site retention, etc.). Since detailed final site plans for No Project Alternative B are not fully developed, this alternative could potentially result in more impervious surfaces than the SUMC Project and existing conditions, and therefore, could result in higher stormwater runoff rates. However, unlike the SUMC Project, if No Project Alternative B increases the amount of impervious surfaces above existing conditions, it would not be required to implement HMP controls to prevent off-site erosion in San Francisquito Creek because it is in an area exempt from requiring HM controls. Therefore, impacts associated with increased runoff on off-site erosion could be significant because San Francisquito Creek is sediment impaired. This would be a new significant impact of No Project Alternative B.

If No Project Alternative B is found to have more impervious surfaces than the SUMC Project, then the following mitigation measure would apply. This mitigation measure, which is not identified for the SUMC Project, would reduce the potential No Project Alternative B impacts on off-site erosion to less-than-significant levels. (S/LTS)

- *No Net Increase in Runoff.* Prior to receiving a grading or building permit, the SUMC Project sponsors shall develop and implement a Final Site Plan that does not increase the amount of post-construction stormwater runoff from the SUMC Site.

Flooding and Stormwater Conveyance Capacity. As mentioned above, unlike the SUMC Project, No Project Alternative B could increase the amount of impervious surfaces that could contribute more stormwater runoff. However, the No Project Alternative B effect on flood event stormwater runoff would not be substantially different than the SUMC Project, which would be less than significant. Consequently, and the potential impacts of No Project Alternative B on flooding and stormwater conveyance would be less than significant. (LTS)

Degradation of Surface Water Quality. Existing regulatory requirements would prevent substantial transport of pollutants in stormwater runoff or to the sewer drain system by No Project Alternative B. However, unlike the SUMC Project, No Project Alternative B would not replace more than 50 percent of the SUMC Site's impervious surfaces and therefore, No Project Alternative B would not have to implement post-construction stormwater quality BMPs to treat entire SUMC Sites runoff. Although there is a higher potential for pollutants in stormwater runoff and degradation of surface water quality from implementation of No Project Alternative B compared to the SUMC Project, No Project Alternative B impacts on degradation of surface water quality would remain similar to existing conditions and impacts would be less than significant. (LTS)

Dam Failure Inundation. No Project Alternative B would not increase the number of people with potential exposure to dam failure inundation compared to existing conditions and would reduce the number of people compared with the SUMC Project. Therefore, there would be no impact associated with dam failure inundation. (NI)

Violation of Any Water Quality Standards or Waste Discharge Requirements (WDRs). No Project Alternative B WDRs and water quality standards would be the same as for the SUMC Project. Similar to SUMC Project, existing City regulations, permitting process, and construction inspection ensures that WDRs and water quality standards would not be violated. Consequently, as with the SUMC Project, No Project Alternative B impacts regarding violation of water quality standards or WDRs would be less than significant. (LTS)

Cumulative Impacts. As discussed in Section 3.11, Hydrology, cumulative impacts associated with current and future growth and development within the San Francisquito Creek watershed, surface runoff and erosion, flooding and stormwater conveyance capacity, streambank instability, degradation of surface water and groundwater quality, dam inundation, and violation of water quality standards and WDRs would be less than significant. Cumulative impacts within the Santa Clara Valley Groundwater Subbasin, on groundwater recharge, and on the local water table are less than significant with existing regulations and management. (LTS)

Hazardous Materials

Exposure to Hazardous Materials During Construction. Construction, demolition, and renovation activities could expose construction workers and the community to potential toxic contaminants associated with building materials, such as ACM. Additionally, building components containing PCBs, lead, and/or mercury could also be found in the buildings proposed to be demolished under this alternative. Exposure to these materials during construction, demolition, and renovation activities is considered a potentially significant impact, similar to the SUMC Project. However, adherence to all applicable health and safety requirements for these substances, along with the following mitigation measure as proposed for the SUMC Project, would ensure that potential exposure impacts are less than significant, similar to the SUMC Project. (S/LTS)

- HM-2.1: Conduct Asbestos Survey at the SUMC Sites

As part of the proposed demolition, No Project Alternative B would demolish approximately 79,800 square feet of buildings at 701 and 703 Welch Road. Environmental assessments have been completed for these sites, which describe the historic uses and evaluate the current conditions at each location (as described in the analysis for the SUMC Project). The Phase I Assessment completed for 701 Welch in June 2006 concluded no major evidence of hazardous materials accidents or spills, and, therefore, did not recommend further soil and/or groundwater testing.

The Phase I Assessment for 703 Welch Road recommended a Phase II ESA to further investigate the soil and wastewater quality. The Phase II ESA concluded that the soil quality within a limited area of approximately 4 feet by 9 feet near four discharge points at the building had been affected by contaminated discharge of wastewater (from the amalgam separators) and recommended the discontinued practice of discharging wastewater from the amalgam separators into the landscape or garden. Such discharge activities have since been discontinued consistent with this recommendation.

No Project Alternative B would avoid major excavations and construction on potentially contaminated sites, thereby avoiding the significant impact associated with construction activities and exposure to workers and the public from existing soil and groundwater contamination as identified for the SUMC Project. Therefore, a less-than-significant impact would occur related to releasing contaminated soil on groundwater.

Similar to the SUMC Project, No Project Alternative B would entail demolition and excavation at potentially contaminated sites (from known soil and groundwater contamination as described above). Unlike the SUMC Project, however, this alternative would not involve construction at the Hoover Pavilion Site; therefore, hazardous materials impacts at this site would not occur. Nonetheless, impacts on construction personnel and the public due to exposure to contaminated soil/and or groundwater during construction activities at the Main SUMC Site are considered significant. Implementation of the following mitigation measures, as identified for the SUMC Project, would reduce the impacts to less than significant with respect to exposure of construction workers and the community to contaminated soil and groundwater during construction. (S/LTS)

- HM-3.1: Perform a Phase II ESA for the 701 Welch Site
- HM-3.2: Excavate Contaminated Soil from the 703 Welch Site

Exposure to Hazardous Materials During Operation. Operations in the new replacement hospitals, which would be approximately 9,000-square-feet larger than the existing hospitals (new hospital floor area) would include hazardous materials (such as flammable gas, oxidizers, and corrosive materials) and biohazardous materials (such as microorganisms, bacteria, and viruses). Exposure to hazardous and biohazardous materials by physicians, staff, patients, and visitors could occur through activities associated with hazardous materials handling, storage, and accidental release. However, control measures exist, explicitly in federal and State law, to reduce or prevent exposure to hazardous chemical materials and minimize worker safety risks. By adhering to all applicable laws and regulations, No Project Alternative B would result in a less-than-significant impact with regard to exposure to hazardous materials, as with the SUMC Project. In addition, the number of beds would be reduced from existing conditions under No Project Alternative B. Therefore, the level of operation and its associated hazardous materials use would also decrease from existing conditions. As such, a less-than-significant impact would occur. (LTS)

Safety Hazards to Schools. Construction of No Project Alternative B would include construction activities similar to the SUMC Project, which could lead to increased exposure of hazardous materials to nearby schools. The LPCH includes an on-site school within the facility. The No Project Alternative B construction activities could have the potential of increasing the amount of hazardous materials used on-site. Similarly to the SUMC Project, the No Project Alternative B would be subject to regulation and operation practices that minimize hazard risks and would ensure that associated risks are not substantially increased. As such, impacts associated with hazardous emissions within one-quarter mile of an existing or proposed school, including the on-site school locate within the LPCH facility, would be less than significant. (LTS)

Wildfire Risk. Similar to the SUMC Project, construction activities related to No Project Alternative B would occur outside the fire hazard zone, as identified in the City of Palo Alto Emergency Operations Plan.[36] Given its location, this alternative would not pose an impact regarding wildfire risk. No impacts would occur. (NI)

Safety Hazard from Public Airports. Similar to the SUMC Project, No Project Alternative B would not be located within 2 miles of a public airport or within the jurisdiction of any ALUP. Therefore, it would not expose worker and/or residents to a safety hazard from a public airport. Additionally, this alternative would not be located within the jurisdiction of any ALUP. Therefore, no impacts would occur. (NI)

Emergency Response or Evacuation Plans. The demolition and construction phase of No Project Alternative B would involve construction worker trips and the movement of construction trucks and heavy equipment, although to a lesser extent than the SUMC Project. No Project Alternative B would use the same construction truck routes as the SUMC Project, many of which are identified as primary evacuation routes in the Palo Alto Emergency Operation Plan (EOP) and the Comprehensive Plan. As such, construction traffic could potentially interfere within emergency access along these routes, resulting in a significant impact. However, No Project Alternative B would not increase on-site activity compared to existing conditions; therefore, operation of this alternative would have no impact on emergency response or routes. The below mitigation measures, as outlined for the SUMC Project, would reduce the impacts to emergency response and evacuation plans during construction to less than significant. (S/LTS)

- HM-10.1: Coordinate Construction Activities with the City of Palo Alto
- TR-1.1: Provide Off-Street Parking for Construction Related Vehicles
- TR-1.4: Restrict Construction Hours
- TR-1.5: Restrict Construction Truck Routes
- TR-1.6: Protect Public Roadways During Construction
- TR-1.8: Prepare and Implement Construction Impact Mitigation Plan

Cumulative Impacts. As discussed in Section 3.12, Hazardous Materials, cumulative development would increase the use, storage, and handling of hazardous materials within the SUMC Sites and adjacent areas and also could increase risk of exposure at schools within a quarter mile of the SUMC Sites. However, these activities would be subject to laws and regulations pertaining to the handling, storage, and disposal of hazardous materials as described in Section 3.12. As such, cumulative impacts related to hazardous materials use, storage, and handling would be less than significant under both this alternative and the SUMC Project. With both the SUMC Project and this alternative, there would be no cumulative impacts related to construction of schools on contaminated property, hazards from wildland fires, or airport operations.

[36] City of Palo Alto, Emergency Operations Plan, June 2007.

In replacing on-site structures, this alternative could expose workers to contaminants associated with building materials, such as asbestos, and could also disturb contaminated soils on site. The 777 Welch Road project, almost adjacent to the Main SUMC Site, would also potentially release contaminants associated with building materials. That project and this alternative could result in significant cumulative impacts. The contribution of No Project Alternative B would be considerable given the extent of demolition involved. Mitigation Measure HM-2.1 would involve measures to reduce exposure of persons to hazardous materials (such as asbestos). These mitigation measures would reduce No Project Alternative B's contribution to a less than cumulatively considerable level.

Construction of reasonably foreseeable projects within the City could involve increased intersection delays, resulting in significant cumulative construction-period impacts on emergency access. No Project Alternative B's contribution to the cumulative impact on emergency response and evacuation plans would be cumulatively considerable due to the substantial hospital construction. However, Mitigation Measures HM-10.1, TR-1.1, TR-1.4 through TR-1.6, and TR-1.8, would reduce No Project Alternative B's contribution to cumulative impacts on emergency evacuation and response plans to less than cumulatively considerable. (S/LTS)

Population and Housing

Population Increases. The daytime population associated with employment and visitorship would decrease under No Project Alternative B relative to existing conditions. This is because the SHC and LPCH hospitals' inpatient capacity would be reduced and fewer staff would be needed. As no net increase in employment would occur, there would be no impact with respect to direct employment and visitor population increases. In addition, there would be no impact with respect to indirect population increases associated with increased demand for new housing units. (NI)

Displacement of Housing. Similar to the SUMC Project, this alternative would have no impact on the displacement of existing housing as no housing exists on the SUMC Sites. (NI)

Jobs to Employed Residents Ratio. The jobs to employed residents ratio impact is not, by itself, considered an environmental impact; however, it is analyzed because this impact could have the potential to result in secondary environmental impact on air quality and climate change. Nonetheless, this alternative would not displace existing housing, as no housing exists on the SUMC Sites. As such, no Project Alternative B would not exacerbate imbalances in the jobs to employed residents ratio or the jobs to housing ratio.

Cumulative Impacts. No Project Alternative B would not increase the number of jobs or alter the number of housing units on the SUMC Site. Therefore, in combination with existing and reasonably foreseeable probable future development, No Project Alternative B would result in no cumulative impact. (NI)

Public Services

Demand for Services. Under No Project Alternative B, the total number of beds in the Main SUMC Site would be reduced from current conditions due to right-sizing at the new facilities, thus reducing staff and patient visits. As with the SUMC Project, no residents would be introduced to the SUMC sites. As a result, No Project Alternative B would result in less demand and utilization of the City's public services than existing conditions, and less then the SUMC Project; No Project Alternative B would have fewer public services impacts than current conditions and the SUMC Project. Because the No Project Alternative B would not result in any impacts to the provision of public services, it would have no potential to contribute to a cumulative impact regarding public services.

It should be noted that one of the SUMC Project's objectives is to meet existing and projected future demand for patient care. This includes increasing the size of the ED to provide adequate patient waiting and triage space, and the construction of trauma rooms consistent with contemporary facility standards.[37] This would not occur under the No Project Alternative B, and thus, would result in inadequate healthcare services for the City of Palo Alto and the region. (NI)

Utilities

Water Demand. No Project Alternative B would not increase demand for water compared with existing conditions. Although the square footage of the replacement hospital building would be slightly larger than the existing building, the replacement building would be constructed with water-conserving fixtures similar to the proposed SUMC Project. In addition, No Project Alternative B would decrease the number of beds on the Main SUMC Site and therefore, would decrease the amount of on-site activity. Since this alternative would ultimately involve less on-site activity than current conditions, this alternative would result in no impacts related to water demand. (NI)

Wastewater Generation. As discussed in Section 3.15, Utilities, the SUMC Project would have less-than-significant impacts related to wastewater generation because it would not exceed treatment requirements of the RWQCB, would not significantly increase use of the wastewater disposal system, and would not require expansion or construction of wastewater collection or treatment facilities. This alternative would decrease the number of beds on the Main SUMC Site and therefore, would decrease the amount of on-site activity with a corresponding decrease in wastewater generation. Since this alternative would involve less on-site activity than current conditions, this alternative would result in no impacts related to wastewater generation. (NI)

Stormwater Generation. The SUMC Project would have a less-than-significant impact related to stormwater collection system capacity because it would not significantly increase the amount of stormwater conveyed to the collection system, and would not require expansions or construction of new stormwater systems. No Project Alternative B could increase the runoff rate for small to medium-sized storm events (less than two-year through 10-year storm event) because of the potential for short-term

[37] A description of the existing demand for healthcare and the current deficit of available space to accommodate those demands is presented in Section 2.5, under the "Spatial Constraints" heading.

increases in impervious surface during the 12-year construction period. The Hydrology analysis for this alternative identified a mitigation that would prohibit an increase in post-construction stormwater runoff. With this measure, impacts related to stormwater facilities would be less than significant.

If No Project Alternative B is found to have more impervious surfaces than the SUMC Project, then the following mitigation measure would apply. This mitigation measure, which is not identified for the SUMC Project, would reduce the potential No Project Alternative B impacts related to stormwater facilities to less-than-significant levels. (S/LTS)

- *No Net Increase in Runoff.* Prior to receiving a grading or building permit, the SUMC Project sponsors shall develop and implement a Final Site Plan that does not increase the amount of post construction stormwater runoff from the SUMC Site.

Solid Waste Generation. As discussed in Section 3.15, Utilities, the solid waste facilities that would serve the SUMC Sites have sufficient remaining capacity to accommodate the SUMC Project. Therefore, the solid waste facilities that would serve the SUMC Sites would be sufficient to accommodate No Project Alternative B and, thus, this alternative would not contribute to the need to expand existing or construct new solid waste disposal facilities. In addition, No Project Alternative B would decrease the number of beds on the Main SUMC Site compared with existing conditions, therefore decreasing the amount of on-site activity, No Project Alternative B would involve less on-site activity than current conditions. No Project Alternative B would result in no impacts related to solid waste generation. (NI)

Energy Demand. As discussed in Section 3.15, Utilities, the SUMC Project would have a less-than-significant impact on natural gas and electrical facilities. Since this alternative involves less development than the SUMC Project, it would have a less-than-significant impact on energy facilities. With No Project Alternative B, the demand on energy has the potential to increase from current conditions because of the increase in square footage. However, the increase in square footage is so slight (less than one percent increase from current square footage) that the increased demand on energy would not be significant. In addition, No Project Alternative B would decrease the number of beds on the Main SUMC compared with existing conditions, and would therefore decrease the amount of on-site activity. Thus, this alternative would not require the construction or expansion of new energy facilities. Therefore, like the SUMC Project, No Project Alternative B would have a less-than-significant impact on energy. (LTS)

Cumulative Impacts. As discussed in Section 3.15, Utilities, cumulative impacts related to solid waste facilities are less than significant because the SMART Station and Kirby Canyon Landfill would have adequate capacity to serve their service area in 2025.[38, 39] Similarly, cumulative impacts related to water supply facilities are less than significant because the City plans to implement its WSCP in progressive stages as needed to achieve a positive balance of supplies and demands, and therefore, the

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38 Debi Sargent, Solid Waste Contract Administrator, City of Sunnyvale, Public Works, electronic communication with PBS&J, November 10, 2008.

39 Guy Petraborg, Kirby Canyon Landfill, electronic communication with PBS&J, November 18, 2008.

City can supply its projected demands without exceeding SFPUC projected allocations or the City's SFPUC.[40] Likewise, the RWQCP has adequate wastewater capacity to serve its service area in 2025.[41]

In addition, as discussed in Section 3.15, Utilities, the City's electricity, natural gas, and storm water drainage facilities have sufficient capacity to serve the cumulative development of the City in 2025. Future development in the City would generate an increased demand on utility facilities This increase could require the maintenance and replacement of outdated and deteriorated facilities. The City has a Capital Improvement Program that provides replacements and maintenance for the City's utility facilities.[42] This program is funded by the rates charged by the City to customers for utility services. Any such replacements or maintenance would comply with all applicable environmental regulations and would have a less than significant potential to contribute to a cumulative impact regarding utility facilities. (LTS)

Reduced Intensity Alternative A: Right-Size SHC and LPCH Facilities without Adding Beds

Land Use

Conflicts with Applicable Land Use Designations and Zoning. Like the SUMC Project, Reduced Intensity Alternative A would require a Comprehensive Plan Amendment and rezoning of the Main SUMC Site to accommodate proposed development intensities, which would be adopted prior to any construction. Proposed buildout would not, therefore, conflict with applicable development regulations, and no impact would occur. By comparison, the SUMC Project's impacts would be less than significant. (LTS)

Conflicts with Comprehensive Plan Policies. Under Reduced Intensity Alternative A, noncompliant facilities would be demolished and replaced with new structures. By demolishing and replacing structures that are noncompliant with SB 1953, this alternative would also require mitigation to ensure compliance with Comprehensive Plan policies that protect visual quality, historical resources, urban forest resources, groundwater and stormwater runoff, air quality degradation, and noise incompatibility. However, unlike the SUMC Project, Reduced Intensity Alternative A would result in one significant policy conflict with Policy L-7, which requires new development to address regional needs and overall City welfare and objectives. The number of hospital beds would not increase under this alternative to keep up with demand for medical services. By failing to meet this demand, this alternative would conflict with Policy L-7, a significant and unavoidable impact. (S/SU)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations
- CR-1.2: Prepare HABS Documentation for the Stone Building Complex
- CR-1.3: Prepare and Distribute Written and Photographic Documentation to Agencies

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40 City of Palo Alto, Water Supply Assessment for Stanford University Medical Center Facilities Renewal and Replacement Project and: Simon-Properties Shopping Center Expansion, December 2008.

41 Rick Wetzel, Manager, Water Quality Control Plant in the Public Works Department, City of Palo Alto, electronic communication with PBS&J, November 26, 2007.

42 City of Palo Alto, http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=3954, accessed November 24, 2008.

- CR-1.4: Prepare Permanent Interpretive Displays/Signage/Plaques
- AQ-1.1: Implement Recommended Dust Control Measures
- AQ-1.2: Implement Diesel Emission Reduction Measures
- NO-1.1: Implement Best Management Practices to Reduce Construction Noise
- NO-4.1: Shield or Enclose HVAC Equipment and Emergency Generators
- BR-4.1: Prepare a Tree Preservation Report for all Trees to be Retained
- BR-4.2: Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks
- BR-4.3: Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention
- BR-4.4: Provide a Tree Preservation Bond/Security Guarantee
- BR-4.5: Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category
- HW-3.1: Develop Workplan for any Unknown Contaminated Sites
- *No Net Increase in Runoff* (New mitigation measure not identified for the SUMC Project; see Hydrology analysis for this alternative.)

Compatibility with Adjacent Land Use Character and Conflicts with Established Residential, Recreational, Educational, Religious, or Scientific Uses in the Area. Although development on the SUMC Sites would be more intense than under current conditions, Reduced Intensity Alternative A would not introduce a new land use that would conflict with existing uses. No impact would occur, as for the SUMC Project. (NI)

Division of an Established Community and Farmland Conversion. The SUMC Project would have no impact on the division of an established community or farmland conversion. Similarly, Reduced Intensity Alternative A would not add physical barriers that might result in restriction of customary circulation patterns or a disruption of land use connectivity, nor would it require the acquisition and development of lands currently used for agricultural purposes. (NI)

Adverse Changes to Existing or Planned Land Use Pattern. Although amended land use designations and zoning would be required to implement Reduced Intensity Alternative A, this alternative would maintain the existing overall land use pattern and type. However, Reduced Intensity Alternative A would involve a slight intensification of land uses by increasing building massing and reorienting the current site plan. This intensification of land uses would be isolated to the SUMC Sites; however, the surrounding visual character and views from sensitive viewer locations could be impacted. Without implementation of the City's Architectural Review process to ensure appropriate alignment of proposed structures, this increase in massing would have a significant impact on the existing character and intensity, although to a lesser degree than the SUMC Project. Implementation of Mitigation Measure VQ-2.1, as presented in Section 3.3, Visual Quality, would reduce the potentially significant impacts on overall surroundings to a less-than-significant level. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Cumulative Impacts. This alternative, in combination with other reasonably foreseeable probable future development in the area, would have a less-than-significant cumulative impact on overall existing or planned land uses in the vicinity of the SUMC Sites. Similarly, the SUMC Project would not contribute to a cumulative land use conflict. (LTS)

Visual Quality

Temporary Degradation of Visual Quality. Similar to the SUMC Project, there would be temporary but adverse visual impacts during the construction stage of Reduced Intensity Alternative A. These impacts would result from the demolition of existing buildings, the assembly of new structures, and equipment staging. In addition, there would be a period when both the existing and the new buildings would be erect and operable, creating a crowded appearance. Therefore, as with the SUMC Project, the temporary construction phase of Reduced Intensity Alternative A would result in a significant visual impact. However, the following mitigation measure, as presented for the SUMC Project, would reduce phased construction impacts to less than significant. (S/LTS)

- VQ-1.1: Implement Construction Visual Improvement Plan

Permanent Degradation of Visual Character Post Construction. Similar to the SUMC Project, Reduced Intensity Alternative A would increase on-site massing, reconfigure on-site layout, alter on-site landscaping and lighting, and incorporate new building materials and treatments, resulting in a significant impact. However, this alternative would have a smaller impact than the SUMC Project because of its reduced building mass. In addition, building construction would be limited to the Main SUMC Site and no new buildings would be added at the Hoover Pavilion Site. With mitigation, development under this alternative would not substantially degrade the existing visual character of the SUMC Sites or the surrounding area as it would be required to undergo architectural review by the City (Mitigation Measure VQ-2.1, below). Therefore, impacts to visual character under Reduced Intensity Alternative A would be less than significant with mitigation. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Alteration of Public Viewsheds, View Corridors, or Scenic Roads. The proposed structures under Reduced Intensity Alternative A could obstruct views of the hillsides from public streets, open spaces, and common residential areas (such as the 1100 Welch Road apartments) that are within the line of sight of Reduced Intensity Alternative A structures. This could result in a significant impact. However, since Reduced Intensity Alternative A would comprise of approximately 800,000 square feet less than the SUMC Project, impacts to views would be less noticeable. In addition, no buildings would be added to the Hoover Pavilion Site; therefore, views at this location would remain the same as existing conditions. However, by adhering to the below mitigation measure, development under this alternative would not substantially degrade public view sheds, view corridors, or scenic roads as it would be required to undergo Architectural Review by the City. Therefore, impacts to views under Reduced Intensity Alternative A would be less than significant with mitigation. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Terrain Modification. Since the SUMC Sites are relatively flat, Reduced Intensity Alternative A would have no impact on terrain modifications, as with the SUMC Project. (NI)

New Sources of Light and Glare. Reduced Intensity Alternative A, similar to the SUMC Project, would create a new source of light and glare, resulting in a significant impact. However, this alternative would have a smaller impact as it would only add 445,923 square feet of new floor area to the Main SUMC Site, which is significantly less square footage than under the SUMC Project. However, the new structures at the Main SUMC Site would be constructed within the vicinity of nearby sensitive receptors, such as the 1100 Welch Road apartments. Regardless, development under this alternative would not create a new source of substantial light or glare as it would be required to adhere to Section 18.23.030 of the Municipal Code, which precludes significant glare and off-site spillage. In addition, this alternative would be subject to the below mitigation measure, which requires the alternative to undergo architectural review by the City. Therefore, light and glare impacts under Reduced Intensity Alternative A would be less than significant with mitigation. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Shadowing Public Open Spaces. Although new shadows would be cast under Reduced Intensity Alternative A, there would be significantly fewer shadows than under the SUMC Project due to smaller building mass. In addition, the new shadows would not be cast over public open spaces; therefore Reduced Intensity Alternative A would result in a less-than-significant impact, as with the SUMC Project. (LTS)

Cumulative Impacts. As discussed in Section 3.3, Visual Quality, cumulative impacts associated with visual character, sensitive views, light and glare, and shadowing would be less than significant. As less development would occur under Reduced Intensity Alternative A, cumulative impacts would remain less than significant. In addition, all projects in Palo Alto would be required to undergo architectural review by the City and adhere to Section 18.23.030 of the Municipal Code. (LTS)

Transportation

Construction Impacts. During the demolition and construction phase, it is anticipated that traffic impacts would be primarily due to construction worker trips, the movement of heavy equipment that would be used for demolition and construction to and from the site, as well as material hauling. Although construction plans for this alternative are not available, it is anticipated that the work would occur over several years, and would be completed by 2015. The total number of construction related trips would vary from year to year depending on the type and intensity of construction work being performed. Regardless, the arrival and departure times for construction workers would primarily occur during off-peak hours, typically arriving before 7:00 a.m. and leaving before 4:00 p.m. The movement of heavy construction equipment such as cranes, bulldozers, and dump trucks to and from the site would also be scheduled, where possible, to occur during off-peak hours. However, there is the potential for conflicts between construction related traffic and traffic on the surrounding roadway network. With implementation of the following mitigation measures the significant construction related traffic impacts would be reduced to less-than-significant levels. (S/LTS)

- TR-1.1: Provide Off-Street Parking for Construction Related Vehicles
- TR-1.2: Maintain Pedestrian Access
- TR-1.3: Maintain Bicycle Access
- TR-1.4: Restrict Construction Hour
- TR-1.5: Restrict Construction Truck Routes
- TR-1.6: Protect Public Roadways During Construction
- TR-1.7: Maintain Public Transit Access and Routes
- TR-1.8: Prepare and Implement Construction Impact Mitigation Plan
- TR-1.9: Conduct Additional Measures During Special Events

Operational Impacts. Upon completion of the construction of the new buildings and parking structure, the number of hospital beds would be the same as the number of beds under existing conditions. Therefore the number of patients, the number of patient visitors, and the number of medical staff is also expected to be approximately the same as existing conditions. There would be no change in trip generation for the SUMC Sites. Therefore, unlike the SUMC Project, this alternative would have no adverse traffic impact on intersections or freeway level of service, residential roadways, parking, transit, bicycle and pedestrian access, and emergency vehicle access. (NI)

Cumulative Impacts. As with the SUMC Project analysis, the operational analysis of this alternative captures both project-level and cumulative-level impacts. Construction traffic from this alternative and other foreseeable and concurrent construction could utilize the same routes and have a significant cumulative construction-period impact. As with the SUMC Project, due to the large scale of construction under this alternative, the contribution to the cumulative impact would be considerable. However, as with the SUMC Project, Mitigation Measure TR-1.1 through TR-1.9 would reduce the contribution of this alternative to less than considerable. (S/LTS)

Air Quality

Construction Criteria Air Pollutant Emissions. Similar to the SUMC Project, Reduced Intensity Alternative A could result in significant construction air emissions. However, the intensity and duration of construction activities could be less than that of the SUMC Project. This alternative would require the implementation of standard BAAQMD control measures for fugitive dust and diesel emissions, similar to the SUMC Project. Mitigation measures would reduce construction dust impacts to less-than-significant levels, but could remain significant and unavoidable for NO_x emissions. (S/SU)

- AQ-1.1: Implement Recommended Dust Control Measures
- AQ-1.2: Implement Diesel Emission Reduction Measures

Operational Criteria Air Pollutant Emissions. The Reduced Intensity Alternative A would result in a net increase in square footage of about 445,923 square feet, but it would not add patient beds or additional hospital employees. Thus, it would not result in additional motor vehicle trips and its associated mobile source emissions would be comparable to that of the existing hospitals. Increased stationary source emissions could be associated with this increase in floor area, though not significantly. Because the Reduced Intensity Alternative A would not result in an increase in motor vehicle trips, and only minimally increase area source emissions (such as for heating and cooling), this alternative would result in less-than-significant operational emissions of criteria air pollutants. But like the SUMC project this alternative would also have a less-than-significant impact on localized concentrations of CO. (LTS)

Construction and Operational TACs. The SUMC Project Health Risk Assessment evaluated TAC emissions from construction equipment and new operational sources (i.e., emergency diesel generators, delivery trucks, and additional medical helicopter flights/heliport) and found the associated health impacts to be less than significant. Under Reduced Intensity Alternative A, construction-phase TAC emissions would be lower because the use of diesel-powered construction equipment would be less than would be required for the SUMC Project. The operational sources of TACs associated with the Reduced Intensity Alternative A (i.e., the diesel generators, truck loading docks and heliport) would likely result in less emissions than those evaluated in the SUMC Project Health Risk Assessment, since Reduced Intensity Alternative A would result in less floor area than the SUMC Project. Thus, construction and operational TAC impacts would be less than significant. (LTS)

Cumulative Impacts. The SUMC Project's emissions of NO_x during construction and of TACs during construction and operation were identified as making cumulatively considerable contributions to significant cumulative impacts. Under Reduced Intensity Alternative A, emissions of NO_x during construction would also potentially exceed the BAAQMD's 80 lbs/day threshold, and could contribute to significant cumulative impacts. The TACs emitted during construction and operation, though likely posing a lesser heath risk than those of the SUMC Project, would also make a cumulatively considerable contribution to the high TAC background levels of the area in which the SUMC Sites are located. Consequently, this alternative's cumulative TAC impacts would be cumulatively significant. The same construction-period Mitigation Measure AQ-1.2, mentioned above, would help reduce TAC emission from this alternative, but not to a less than considerable level. Consequently, this alternative's construction NO_x emissions and cumulative TAC impacts would be cumulatively significant. (S/SU)

Climate Change

Consistency with the Climate Protection Plan. Several structures would be fully or partially demolished under Reduced Intensity Alternative A and would be replaced by new structures, resulting in construction emissions. Although the BAAQMD is not introducing greenhouse gas thresholds for construction activities, renovation activities would be required to comply with all applicable BAAQMD recommended greenhouse gas reduction measures in order to be considered less than significant.

Reduced Intensity Alternative A would expand the SHC and LPCH facilities without adding new beds. The resulting increase in floor area would represent approximately 34 percent of the net increase in floor area anticipated under the SUMC Project. This increase in floor area is in response to right-sizing and would not increase the number of beds or operational activities. Further, the newer buildings would comply with current Title 24 requirements, which would make them more efficient.

Therefore, greenhouse gas emissions associated with operational activities are not anticipated to increase under this alternative.

For the replacement facilities, Reduced Intensity Alternative A is assumed to include an Emissions Reduction Program similar to that proposed under the SUMC Project, although such a program would be scaled down to reflect the less intensive development program proposed under this alternative. The program could potentially result in a decrease in emissions from energy consumption as upgrades are proposed which result in an increase in efficiency concurrent with new building regulations. The inclusion of the Emissions Reduction Program would further some of the goals of the Palo Alto Climate Protection Plan.

AB 32, the CARB's Scoping Plan, incorporates a 30 percent reduction target from 2020 BAU emissions limits. The City's Climate Protection Plan's incorporates this BAU approach to quantify emissions from significant, new projects which were not included in the City's existing inventory. As such, this analysis applies the 2020 reduction goal (equivalent to 30 percent below BAU) as a target threshold for compliance with the City Climate Protection Plan. Reduced Intensity Alternative A would incorporate compliance with the current Title 24 standard into the new additional floor space added to facilitate the right-sizing. Because the operational levels would not increase, Reduced Intensity Alternative A would not emit significant greenhouse gases and may even reduce greenhouse gases. Therefore, Reduced Intensity Alternative A would have a less than significant impact with respect to consistency with the Climate Protection Plan. (LTS)

Result in Significant Emissions of Greenhouse Gases. Reduced Impact Alternative A would include scaled down programs and design features similar to those proposed under the SUMC Project. This increase in efficiency would not result in greenhouse gas emissions greater than those currently existing and may result in an overall decrease in emissions. Because of the limited emissions during operation and construction, impacts from Reduced Impact Alternative A will be less than considerable with respect to the emission of greenhouse gases. (LTS)

Noise

Construction Impacts. Under Reduced Intensity Alternative A, the types of construction activities would be similar to the SUMC Project, but the amount construction could be less. Nonetheless, impacts under this alternative would still be significant for on-site receptors. However, Mitigation Measure NO-1.1 would not reduce construction noise to less than significant, as with the SUMC Project. (S/SU)

- NO-1.1: Implement Best Management Practices to Reduce Construction Noise

Operational Impacts. Under this alternative, operational noise from on-site HVAC equipment, emergency generators, and loading dock/parking facility operations would be the same as the SUMC Project. That is, there would be significant noise from mechanical equipment but Mitigation Measure NO-4.1 would reduce the impact to less than significant. This alternative would not worsen noise impacts associated with motor vehicle traffic, truck loading/parking facility activities, and medical helicopters using the new heliport. However, as with the SUMC Project, relocation of the ED would add a major ambulance access route along Sand Hill Road with consequent significant unavoidable noise impacts to residential uses along Sand Hill Road between El Camino Real and Durand Road. (S/SU)

- NO-4.1: Shield or Enclose HVAC Equipment and Emergency Generators

Cumulative Impacts. Cumulative noise impacts would be similar under this alternative and the SUMC Project. As with the SUMC Project, there would be significant cumulative construction noise with this alternative, both on site and off site. Mitigation Measure NO-1.1 would be warranted but would not reduce the contribution if this alternative to less than considerable. This alternative would result in significant and unavoidable construction noise impacts. Also, there would be no significant cumulative vibration impacts with the SUMC Project as well as this alternative. No other foreseeable project would generate ambulance noise and so there would no cumulative impacts from ambulance noise. (S/SU)

Cultural Resources

Impacts on the Stone Building Complex. This alternative would demolish the same buildings at the Main SUMC Site as the SUMC Project, including the entire Stone Building complex, which is the only historic resource that would be demolished. Implementation of the mitigation measures proposed for the SUMC Project, also listed below, would reduce some of the cultural resources impacts resulting from demolition of the Stone Building complex; however the loss of the Stone Building complex would remain significant and unavoidable. (S/SU)

- CR-1.2: Prepare HABS Documentation for the Stone Building complex
- CR-1.3: Prepare and Distribute Written and Photographic Documentation to Agencies
- CR-1.4: Prepare Permanent Interpretive Displays/Signage/Plaques

Impacts on the Hoover Pavilion. Under Reduced Intensity Alternative A, no demolition would occur and no new buildings would be added to the Hoover Pavilion Site; therefore, there would be no construction vibration impacts that could damage the Hoover Pavilion. However, the Hoover Pavilion would be renovated to accommodate medical office use (in addition to the current clinic use), but as stated for the SUMC Project, the proposed renovation would have a less-than-significant impact on the historic integrity of the Hoover Pavilion. Rather, the renovation would be performed in a manner that would enhance and preserve the Hoover Pavilion. Therefore, Reduced Intensity Alternative A would have less-than-significant impacts on the Hoover Pavilion Site, as with the SUMC Project. (LTS)

Impacts on Archaeological Resources and Human Remains. Prehistoric cultural resources and human remains have not been encountered within the site of Reduced Intensity Alternative A. As with the SUMC Project, it is possible, although unlikely, that archaeological resources and human remains could be encountered during Reduced Intensity Alternative A's ground-disturbing activities. The following mitigation measures, as identified for the SUMC Project, would ensure that the impact remains less than significant. (S/LTS)

- CR-2.1: Construction Staff Training and Consultation
- CR-3.1: Conduct Protocol and Procedures for Encountering Human Remains

Impacts on Paleontological Resources. There have been significant paleontological finds in the immediate vicinity of the SUMC Sites. As with the SUMC Project, disturbance of any paleontological resources is a significant impact; however, the following mitigation measure, which is presented for the SUMC Project, would reduce the impact to less than significant. (S/LTS)

- CR-4.1: Conduct Protocol and Procedures for Encountering Paleontological Resources

Cumulative Impacts. Cumulative impacts on archaeological and paleontological resources and human remains from this alternative and adjacent development could be significant due to potential presence of these resources in the area. As with the SUMC Project, this analysis conservatively finds that this alternative would have a cumulatively considerable contribution to the cumulative impact. Mitigation measures described above would ensure that this alternative's contribution would be less than cumulatively considerable.

As discussed in Section 3.8, Cultural Resources, cumulative development has had a pre-existing significant cumulative impact on other E.D. Stone structures in Palo Alto. Only one other E.D. Stone building in Palo Alto, the Palo Alto Main Library, which retains sufficient integrity to be eligible for listing. Therefore, the demolition of the Stone Building complex under Reduced Intensity Alternative A would comprise a considerable loss of an historical resource that is a unique and non-renewable member of a finite class. The demolition of the Stone Building complex would have a cumulatively considerable contribution due to the small body of E.D. Stone's work present in the City that retains sufficient integrity to be eligible as historical resources. The contribution of this alternative to the cumulative impact on historic resources would remain considerable, even with aforementioned mitigation measures. (S/SU)

Biological Resources

Special Status Plant or Wildlife Resources. Habitat on-site capable of supporting special-status plants or wildlife is limited to roosting habitat for special-status bats and Cooper's hawk. Buildings in the SUMC area could provide roosting habitat for special-status bat species known from the region and trees in the SUMC area could provide nesting habitat for Cooper's hawk. Removal of trees containing Cooper's hawk nests, or removal of, or modification to, buildings containing active bat roosts could result in the loss of Cooper's hawk or their active nests, individual bats, bat colonies, or their habitat. Reduced Intensity Alternative A would remove several structures at the Main SUMC Site; therefore, implementation of Reduced Intensity Alternative A could have a significant impact on Cooper's hawk and protected bat species, similar to the SUMC Project. However, this would be less of an impact than the SUMC Project because no structures would be removed at the Hoover Pavilion Site. The following mitigation measure, as presented in Section 3.9, Biological Resources, would reduce Reduced Intensity Alternative A's impact on Cooper's hawk and special-status bats to a less-than-significant level. (S/LTS)

- BR-1.1: Conduct Pre-Demolition Survey
- BR-1.2: Avoid Roosting Areas
- BR-1.3: Develop and Employ Bat Nest Box Plan

- BR-1.4: Avoid Tree Removal During Nesting Season
- BR-1.5: Protect Cooper's Hawk in the Event of Nest Discovery

Loss of Riparian or Other Sensitive Habitats. Similar to the SUMC Project, Reduced Intensity Alternative A would have a less-than-significant impact on riparian habitats. It is unlikely that surface runoff or sedimentation from construction under Reduced Intensity Alternative A could reach the creek in a substantial enough quantity to affect riparian vegetation, or cause significant fill of the channel within San Francisquito Creek. Additionally, mitigation measures and Best Management Practices (BMPs) detailed in Section 3.11, Hydrology, would further reduce the potential for loss of riparian or wetland habitats due to sedimentation and erosion. Therefore, Reduced Intensity Alternative A would have less-than-significant impact on the riparian habitat of San Francisquito Creek. (LTS)

Interference with Species Movement, Wildlife Corridors, or Nursery Sites. Similar to the SUMC Project, Reduced Intensity Alternative A would require the modifications to existing structures, and removal of on-site trees, which could be used by migratory birds as nursery sites including birds that nest on buildings (i.e., swallows, phoebes, etc.). However, fewer trees would be removed than under the SUMC Project since Reduced Intensity Alternative A would include fewer square feet. Nonetheless, Reduced Intensity Alternative A could result in a significant impact to migratory bird nests. The following mitigation measures, as recommended for the SUMC Project, would reduce the impact to less than significant. (S/LTS)

- BR-3.1: Avoid Tree Removals or Building Demolition During Nesting Season
- BR-3.2: Protect Birds in the Event of Nest Discovery

Impacts on Protected Trees. Implementation of Reduced Intensity Alternative A could impact Protected Trees during preparation for building construction, or could result in the loss of Protected Trees due to damage sustained during the construction phase. Since Reduced Intensity Alternative A would require a smaller building footprint area than the SUMC Project and would not construct a module in Kaplan Lawn, Reduced Intensity Alternative A would have less of an impact on Protected Trees, especially to the biologically and aesthetically significant Protected Trees in the FIM 1 grove. Nonetheless, Reduced Intensity Alternative A would still result in a significant impact. The following mitigation measures, as identified for the SUMC Project, would reduce Reduced Intensity Alternative A's impact. However, these mitigation measures would not be able to avoid and preserve all Protected Trees; therefore, Reduced Intensity Alternative A would result in a significant and unavoidable impact. (S/SU)

- BR-4.1: Prepare a Tree Preservation Report for all Trees to be Retained
- BR-4.2: Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks
- BR-4.3: Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention
- BR-4.4: Provide a Tree Preservation Bond/Security Guarantee

- BR-4.5: Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category
- BR-4.5: Minor Site Modifications to Preserve Biologically and Aesthetically Significant Protected Trees

Conflicts with an HCP or NCCP. The Santa Clara Valley HCP is the nearest adopted HCP/NCCP in the region, but the SUMC Sites are not included within its boundaries. The Stanford University HCP is currently in public review and has not been adopted. As such, similar to the SUMC Project, Reduced Intensity Alternative A would have no impact on an applicable HCP or natural communities conservation plan. (NI)

Cumulative Impacts. Cumulative development of past, current, and reasonably foreseeable probable future development, could negatively impact special-status bats, Cooper's hawk, and migratory birds, thus resulting in a significant cumulative impact on these resources. However, the size of disturbance within the project area under Reduced Intensity Alternative A is smaller than under the SUMC Project. The project's contribution to regional loss of urban habitat would be less than with the SUMC Project. Therefore, as with the SUMC Project, with implementation of Mitigation Measures BR-1.1 to BR-1.3 for special-status bats, and Mitigation Measures BR-1.4 and BR-1.5 for Cooper's hawk, this alternative's contribution to the regional loss of urban habitat for special-status bats and Cooper's hawk is less than cumulatively considerable. Similar to the SUMC Project, even with implementation of mitigation measures discussed above, the contribution of Reduced Intensity Alternative A to the cumulative loss of Protected Trees would be cumulatively considerable. (S/SU)

Geology, Soils, and Seismicity

Exposure to Seismic-Related Hazards. Reduced Intensity Alternative A would have a less-than-significant potential to expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground-shaking, seismic-related ground failure (including liquefaction), landslides, or expansive soil. Compared to the SUMC Project, this alternative would have less development and thus a lesser risk of exposing persons or new structures to such hazards. (LTS)

Exposure to Other Geotechnical Hazards. Reduced Intensity Alternative A would have a less-than-significant potential to be located on a geologic units or on soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. Compared to the SUMC Project, this alternative would have less development and thus a lesser risk of exposing persons or new structures to such hazards. (LTS)

Cause Substantial Erosion or Siltation. Reduced Intensity Alternative A would have a less-than-significant potential to cause substantial erosion or siltation. Compared to the SUMC Project, this alternative would have less development and thus a lesser degree of impact. (LTS)

Cumulative Impacts. Soil and geologic conditions are site-specific and there is little, if any, cumulative relationship between the SUMC Sites and other areas in the City. As such, the potential for cumulative impacts to occur is geographically limited for many geology and soils impact analyses. Reduced Intensity Alternative A would have a less-than-significant potential to cause cumulatively substantial erosion or siltation. Construction and operational activities embodied in Reduced Intensity Alternative A would be subject to the same regulations as the SUMC Project. Consequently, cumulative impacts would be less than significant. (LTS)

Hydrology

Flood Risks and Flood Flows. The SUMC Sites are not in a 100-year flood hazard area and therefore, as with the SUMC Project, there would be no impact from Reduced Intensity Alternative A regarding flood hazards and flood flows. (NI)

Groundwater Recharge and Local Water Table. As with the SUMC Project, no new groundwater supply wells would be implemented under Reduced Intensity Alternative A. If the new parking structure and/or replacement buildings are below or partially below ground surface, temporary groundwater dewatering may be required during construction. As with the SUMC Project, the Reduced Intensity Alternative A impact on direct lowering of the water table level would be less than significant. (LTS)

Unlike the SUMC Project, Reduced Intensity Alternative A could increase the overall site impervious surfaces, thereby reducing the potential for long-term groundwater recharge. As explained in Section 3.11, Hydrology, the SUMC Sites are not in a significant groundwater recharge area and a confining layer separates the surface water table groundwater from the deep groundwater aquifer in the vicinity. Consequently, although Reduced Intensity Alternative A could reduce the potential for groundwater recharge compared to the existing conditions, and possibly compared to the SUMC project, the potential would be a less-than-significant operational impact on groundwater recharge. (LTS)

Groundwater Quality. Unlike the SUMC Project, there would be no impact of Reduced Intensity Alternative A construction activities on pollutant plume hydrology and plume movement at the Hoover Pavilion Site. As with the SUMC Project, existing regulations would prevent the introduction of construction pollutants into infiltrating water during construction. However, similar to the SUMC Project, Reduced Intensity Alternative A exposure of potentially unknown contaminated soil to rainfall runoff or runon during construction could allow for infiltrating water to pick up pollutants and carry them to underlying groundwater.

The following mitigation measure, as identified for the SUMC Project, would reduce Reduced Intensity Alternative A's impact on groundwater quality to a less-than-significant level. (S/LTS)

- HW-3.1: Develop Workplan for any Unknown Contaminated Sites

Stormwater Runoff and Erosion and Streambank Instability. As with the SUMC Project, compliance with existing regulations would prevent substantial on-site erosion and off-site sediment transport from implementation of Reduced Intensity Alternative A. Therefore, similar to the SUMC Project, Reduced Intensity Alternative A impacts on on-site erosion and off-site sediment transport would be less than significant.

As explained in Section 3.11, Hydrology, the Santa Clara Municipal Regional Permit HM Standard set limitations on increases in peak stormwater runoff rate and volume in areas where increased impervious surfaces could contribute to stream bed or bank erosion. HM controls include such site design techniques as reducing impervious surface area, promoting infiltration and evapotranspiration, and introducing alternative site design concepts. Since final detailed site plans for Reduced Intensity Alternative A are not fully developed, this alternative could result in potentially more impervious surfaces than the SUMC Project, and therefore, higher stormwater runoff rates. However, even if Reduced Intensity Alternative A increased the amount of impervious surfaces above existing conditions, it would not be required to implement HM controls to prevent off-site erosion in San Francisquito Creek because it is in an area exempt from requiring HM controls. Consequently, impacts associated with increased runoff on off-site erosion could be significant because San Francisquito Creek is sediment impaired, which is a new significant impact of Reduced Intensity Alternative A.

If Reduced Intensity Alternative A is found to have more impervious surfaces than the SUMC Project, then the following mitigation measure would apply. This mitigation measure, which is not identified for the SUMC Project, would reduce the potential Reduced Intensity Alternative A impacts on off-site erosion to less-than-significant levels. (S/LTS)

- *No Net Increase in Runoff.* Prior to receiving a grading or building permit, the SUMC Project sponsors shall develop and implement a Final Site Plan that does not increase the amount of post construction stormwater runoff from the SUMC Site.

Flooding and Stormwater Conveyance Capacity. As mentioned above, unlike the SUMC Project, Reduced Intensity Alternative A could increase the amount of impervious surfaces that could contribute more stormwater runoff to the storm drain system and San Francisquito Creek. However, Reduced Intensity Alternative A effect on flood event stormwater runoff would not be substantially different than the SUMC Project, which would be less than significant. Consequently, this would not substantially alter flood flows or stormwater conveyance capacities and Reduced Intensity Alternative A impact on flooding and stormwater conveyance would be less than significant. (LTS)

Degradation of Surface Water Quality. Like the SUMC Project, existing regulations would prevent substantial transport of pollutants in stormwater runoff or to the sewer system by Reduced Intensity Alternative A. However, unlike the SUMC Project, Reduced Intensity Alternative A probably would not replace more than 50 percent of the SUMC Sites' impervious surfaces and therefore, Reduced Intensity Alternative A would not be required to implement post-construction stormwater quality BMPs to treat entire SUMC Sites' runoff. Although there is a higher potential for pollutants in stormwater runoff to degrade surface water quality from implementation of Reduced Intensity Alternative A, compared to the SUMC Project, Reduced Intensity Alternative A impacts on degradation of surface water quality would remain similar to existing conditions and impacts would be less than significant. (LTS)

Dam Failure Inundation. Reduced Intensity Alternative A would not increase the exposure of people to dam failure inundation compared to existing conditions, and would reduce the number of people exposed to risk compared to the SUMC Project. Therefore, there would be no impact associated with dam failure inundation. (NI)

Violation of Any Water Quality Standards or Waste Discharge Requirements (WDRs). Reduced Intensity Alternative A WDRs and water quality standards would be the same as for the SUMC Project. Similar to SUMC Project, existing City regulations, permitting process, and construction inspection ensures that WDRs and water quality standards would not be violated. Consequently, as with the SUMC Project, Reduced Intensity Alternative A impacts regarding violation of water quality standards or WDRs would be less than significant. (LTS)

Cumulative Impacts. As discussed in Section 3.11, Hydrology, cumulative impacts associated with current and future growth and development within the San Francisquito Creek watershed, surface runoff and erosion, flooding and stormwater conveyance capacity, streambank instability, degradation of surface water and groundwater quality, dam inundation, and violation of water quality standards and WDRs would be less than significant. Cumulative impacts within the Santa Clara Valley Groundwater Subbasin, on groundwater recharge, and on the local water table would be less than significant with existing regulations and management. (LTS)

Hazardous Materials

Exposure to Hazardous Materials During Construction. Construction, demolition, and renovation associated with Reduced Intensity Alternative A could expose construction workers and the community to potential toxic contaminants associated with building materials, such as ACM. Additionally, building components containing PCBs, lead, and/or mercury could also be found in the buildings proposed to be demolished under this alternative. Exposure to these materials during construction, demolition, and renovation activities is considered a potentially significant impact, similar to the SUMC Project. However, adherence to all applicable health and safety requirements for these substances, along with the following mitigation measure as proposed for the SUMC Project, would ensure that potential exposure impacts are less than significant, similar to the SUMC Project. (S/LTS)

- HM-2.1: Conduct Asbestos Survey at the SUMC Sites

As part of the proposed demolition, Reduced Intensity Alternative A would demolish approximately 79,800 square feet of buildings at 701 and 703 Welch Road. Environmental assessments have been completed for these sites, which describe the historic uses and evaluate the current conditions at each location (as described in the analysis for the SUMC Project). The Phase I Assessment completed for 701 Welch in June 2006 concluded no major evidence of hazardous materials accidents or spills, and, therefore, did not recommend further soil and/or groundwater testing.

The Phase I Assessment for 703 Welch Road recommended a Phase II ESA to further investigate the soil and wastewater quality. The Phase II ESA concluded that the soil quality within a limited area of approximately 4 feet by 9 feet near four discharge points at the building had been affected by contaminated discharge of wastewater (from the amalgam separators) and recommended the discontinued practice of discharging wastewater from the amalgam separators into the landscape or garden. Such discharge activities have since been discontinued consistent with this recommendation.

Similar to the SUMC Project, Reduced Intensity Alternative A would entail demolition and excavation at potentially contaminated sites (from known soil and groundwater contamination as described above). Unlike the SUMC Project, however, this alternative would not involve construction at the Hoover Pavilion Site; therefore, hazardous materials impacts at this site would not occur. Nonetheless, impacts on construction personnel and the public due to exposure to contaminated soil and/or groundwater during construction activities at the Main SUMC Site are considered significant. Implementation of the following mitigation measures, as identified for the SUMC Project, would reduce the impacts to less than significant with respect to exposure of construction workers and the community to contaminated soil and groundwater during construction. (S/LTS)

- HM-3.1: Perform a Phase II ESA for the 701 Welch Site.
- HM-3.2: Excavate Contaminated Soil from the 703 Welch Site

Exposure to Hazardous Materials During Operation. Similar to the SUMC Project, Reduced Intensity Alternative A would include hazardous materials (such as flammable gas, oxidizers, and corrosive materials) and biohazardous materials (such as microorganisms, bacteria, and viruses) as part of the hospitals' operation activities. All uses, handling, and disposal of hazardous materials are highly regulated under existing federal, State, and local regulations. As such, compliance with all regulations would ensure that impacts associated with exposure to hazardous materials during operation activities under Reduced Intensity Alternative A remain less than significant, as with the SUMC Project. (LTS)

Safety Hazards to Schools. Like the SUMC Project, this alternative would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. No existing K-12 schools are located within one-quarter mile of the location of the Reduced Intensity Alternative A site.

However, the LPCH includes an on-site school within the facility. The Reduced Intensity Alternative A would demolish and construct new buildings, and as such, could have the potential of increasing the amount of hazardous materials used on-site. Similarly to the SUMC Project, the Reduced Intensity Alternative A would be subject to regulation and operation practices that minimize hazard risks and would ensure that associated risks are not substantially increased. Consequently, impacts associated with hazardous materials exposure within one-quarter mile of an existing or proposed school, including the on-site school locate within the LPCH facility, would be less than significant. (LTS)

Wildfire Risk. Similar to the SUMC Project, construction activities related to Reduced Intensity Alternative A would occur outside the fire hazard zone, as identified in the City of Palo Alto Emergency Operations Plan.[43] Therefore, this alternative would not have an impact with regard to wildfire risk. No impacts would occur. (NI)

[43] City of Palo Alto, Emergency Operations Plan, June 2007.

Safety Hazard from Public Airports. Similar to the SUMC Project, Reduced Intensity Alternative A would not be located within the jurisdiction of any ALUP or within 2 miles of a public airport. Therefore, it would not expose worker and/or residents to a safety hazard from a public airport. As such, no impacts would occur. (NI)

Emergency Response or Evacuation Plans. The demolition and construction phase of Reduced Intensity Alternative A would involve construction worker trips and the movement of construction trucks and heavy equipment, although to a lesser extent than the SUMC Project. Reduced Intensity Alternative A would use the same construction truck routes as the SUMC Project, many of which are identified as primary evacuation routes in the EOP and the Comprehensive Plan. As such, construction traffic could potentially interfere within emergency access along these routes, resulting in a significant impact. However, Reduced Intensity Alternative A would not increase on-site activity compared to existing conditions; therefore, operation of this alternative would have no impact on emergency response or routes. The below mitigation measures, as outlined for the SUMC Project, would reduce the impacts to emergency response and evacuation plans during construction to less than significant. (S/LTS)

- HM-10.1: Coordinate Construction Activities with the City of Palo Alto
- TR-1.1: Provide Off-Street Parking for Construction Related Vehicles
- TR-1.4: Restrict Construction Hours
- TR-1.5: Restrict Construction Truck Routes
- TR-1.6: Protect Public Roadways During Construction
- TR-1.8: Prepare and Implement Construction Impact Mitigation Plan

Cumulative Impacts. As discussed in Section 3.12, Hazardous Materials, cumulative development would increase the use, storage, and handling of hazardous materials within the SUMC Sites and adjacent areas and also could increase risk of exposure at schools within a quarter mile of the SUMC Sites. However, these activities would be subject to laws and regulations pertaining to the handling, storage, and disposal of hazardous materials as described in Section 3.12. As such, cumulative impacts related to hazardous materials use, storage, and handling would be less than significant under both this alternative and the SUMC Project. With both the SUMC Project and this alternative, there would be no cumulative impacts related to construction of schools on contaminated property, hazards from wildland fires, or airport operations.

During demolition and excavation activities, this alternative could expose workers to contaminants associated with building materials, such as asbestos, and could also disturb contaminated soils on site. The 777 Welch Road project, almost adjacent to the Main SUMC Site, would also potentially release contaminants associated with building materials, and potentially disturb previously contaminated soils, which are known to occur in the areas adjacent to the SUMC Sites. That project and this alternative could result in significant cumulative impacts. The contribution of Reduced Intensity Alternative A would be considerable given the extent of construction involved. Mitigation Measure HM-2.1 would involve measures to reduce exposure of persons to hazardous materials (such as asbestos). Mitigation Measures HM-3.1 through and HM-3.4, would involve investigations at other SUMC areas, remediation, and preparation of the Site Management Plan for remediation activities. These mitigation measures would reduce Reduced Intensity Alternative A's contribution to a less than cumulatively considerable level.

Construction of reasonably foreseeable projects within the City could involve increased intersection delays, resulting in significant cumulative construction-period impacts on emergency access. Reduced Intensity Alternative A's contribution to the cumulative impact on emergency response and evacuation plans would be cumulatively considerable. However, Mitigation Measures HM-10.1, TR-1.1, TR-1.4 through TR-1.6, and TR-1.8, would reduce Reduced Intensity Alternative A's contribution to cumulative impacts on emergency evacuation and response plans to less than cumulatively considerable. (S/LTS)

Population and Housing

Population Increases. The number of inpatient beds under Reduced Intensity Alternative A would be approximately the same as under existing conditions. As such, no substantial direct population increases would be expected to occur with respect to inpatients and staff. (NI)

Displacement of Housing. Similar to the SUMC Project, this alternative would have no impact on the displacement of existing housing as no housing exists on the SUMC Sites. (NI)

Jobs to Employed Residents Ratio. The jobs to employed residents ratio impact is not, by itself, considered an environmental impact; however, it is analyzed because this impact could have the potential to result in secondary environmental impact on air quality and climate change. Nonetheless, Reduced Intensity Alternative A would not exacerbate imbalances in the jobs to employed residents ratio or the jobs to housing ratio. Therefore, this alternative would not displace existing housing, as no housing exists on the SUMC Site.

Cumulative Impacts. Reduced Intensity Alternative A would not increase the number of jobs or alter the number of housing units on the SUMC Site. In addition, as with the SUMC Project, cumulative development with this alternative would not have cumulative impacts on the City's jobs to employed residents ratio. Therefore, in combination with existing and reasonably foreseeable probable future development, Reduced Intensity Alternative A would result in no cumulative impact. (NI)

Public Services

Demand for Public Services. Under Reduced Intensity Alternative A, the occupancy and number of employees on the SUMC Sites would not increase from current conditions. Although this alternative would involve some construction, the total number of beds on the SUMC Sites would remain the same as current conditions, and therefore, there would not be a substantial increase in employment or on-site activity on the SUMC Sites. In addition, as with the SUMC Project, no residents would be introduced to the SUMC Sites. Because there would be no increase to the on-site population, there would not be a greater demand or utilization of the City's public services than currently exists. As a result, Reduced Intensity Alternative A would have the same public services demand as current conditions, and fewer impacts than the SUMC Project. Reduced Intensity Alternative A would have less-than-significant impacts on the provision of public services. (LTS)

It should be noted that one of the SUMC Project's objectives is to meet existing and projected future demand for patient care. This includes increasing the size of the ED to provide adequate patient waiting and triage space, and the construction of trauma rooms consistent with contemporary facility standards.[44] This would not occur under the Reduced Intensity Alternative A and thus, would result in inadequate healthcare services for the City of Palo Alto and the region.

Cumulative Demand for Services. As discussed in Section 3.14, Public Services, cumulative impacts associated with past, current, and reasonably foreseeable probable future growth and development within the City of Palo Alto, with respect to fire protection, police protection, schools, and parks and recreational demands would be less than significant for fire protection and parks. Because this alternative would involve a lesser level of development compared to the SUMC Project, and would not increase the level of post-construction activity on site, then cumulative impacts on fire protection and parks would also be less than significant with this alternative. However, cumulative demand on police service and schools could necessitate construction of new or expanded facilities, which could result in significant impacts. As discussed in Section 3.14, Public Services, the SUMC Project's contribution to the cumulative need for these new facilities would be less than cumulatively considerable. Because this alternative would involve a lesser level of development compared to the SUMC Project, and would not increase the level of post-construction activity on site, then its contribution would also be less than considerable. (LTS)

Utilities

Water Demand. Reduced Intensity Alternative A would not substantially increase demand for water compared to existing conditions. Although the square footage of the replacement hospital building would be larger than the existing building, the replacement building would be constructed with water-conserving fixtures similar to the proposed SUMC Project. Further, this alternative would not increase the number of beds on the SUMC Sites and, therefore, would not substantially increase the amount of on-site activity. Since this alternative would not increase on-site activity from existing conditions and would involve less development than the SUMC Project, this alternative would result in less-than-significant impacts related to water demand, as with the SUMC Project. (LTS)

Wastewater Generation. As discussed in Section 3.15, Utilities, the SUMC Project would have less-than-significant impacts related to wastewater generation. Reduced Intensity Alternative A would not increase the number of beds on the SUMC Sites and, therefore, would not increase the amount of on-site activity. Since this alternative would not increase on-site activity from existing conditions and would involve less development than the SUMC Project, this alternative would result in less-than-significant impacts related to wastewater generation. (LTS)

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[44] A description of the existing demand for healthcare and the current deficit of available space to accommodate those demands is presented in Section 2.5, under the "Spatial Constraints" heading.

Stormwater Generation. As discussed in Section 3.15, Utilities, the SUMC Project would have less-than-significant impacts related to stormwater collection system capacity because it would not significantly increase use of the stormwater collection system, and would not require expansions or construction of new stormwater systems. Reduced Intensity Alternative A could increase the runoff rate for small to medium-sized storm events (less than two-year through 10-year storm event) because of the potential for short-term increases in impervious surface during the construction period. The Hydrology analysis for this alternative identified a mitigation that would prohibit an increase in post-construction stormwater runoff. With this measure, impacts related to stormwater facilities would be less than significant.

If Reduced Intensity Alternative A is found to have more impervious surfaces than the SUMC Project, then the following mitigation measure would apply. This mitigation measure, which is not identified for the SUMC Project, but is identified for this alternative under Hydrology, above, would reduce the potential Reduced Intensity Alternative A impacts related to stormwater facilities to less-than-significant levels. (S/LTS)

- *No Net Increase in Runoff.* Prior to receiving a grading or building permit, the SUMC Project sponsors shall develop and implement a Final Site Plan that does not increase the amount of post construction stormwater runoff from the SUMC Site.

Solid Waste Generation. As discussed in Section 3.15, Utilities, the solid waste facilities that would serve the SUMC Sites have sufficient remaining capacity to accommodate the SUMC Project. Therefore, the solid waste facilities that would serve the SUMC Sites would be sufficient to accommodate Reduced Intensity Alternative A and, thus, this alternative would not contribute to the need to expand existing or construct new solid waste disposal facilities. Since Reduced Intensity Alternative A would not increase on-site activity from existing conditions, and would involve less development than the SUMC Project, this alternative would result in less-than-significant impacts related to solid waste generation. (LTS)

Energy Demand. As discussed in Section 3.15, Utilities, the SUMC Project would have a less-than-significant impact on natural gas and electrical facilities. Since this alternative involves less development than the SUMC Project, it would also have a less-than-significant impact on energy producing facilities. With Reduced Intensity Alternative A, the demand on energy has the potential to increase from current conditions because of the increase in square footage. Like the SUMC Project, this increase would require the installation of additional electrical feeder cables, which would occur within the same construction footprint as the SUMC Project. As discussed in Section 2, Project Description, the installation of the additional feeder cables is considered a part of the project and impacts associated with this construction activity are analyzed throughout this document. Therefore, like the SUMC Project, Reduced Intensity Alternative A would have a less-than-significant impact on energy facilities. (LTS)

Cumulative Demand for Utilities. As discussed in Section 3.15, Utilities, cumulative impacts related to solid waste facilities are less than significant because the SMART Station and Kirby Canyon Landfill would have adequate capacity to serve their service area in 2025.[45, 46] Similarly, cumulative impacts related to water supply facilities are less than significant because the City plans to implement its WSCP in progressive stages, as needed to achieve a positive balance of supplies and demands. Therefore, the City can supply for its projected demands without exceeding SFPUC projected allocations or the City's SFPUC Individual Supply Guarantee (ISG).[47] Likewise, the RWQCP has adequate capacity to serve its service area in 2025.[48]

As discussed in Section 3.15, Utilities, the City's electricity, natural gas, and storm water drainage facilities have sufficient capacity to serve the cumulative development of the City in 2025. Future development in the City would generate an increased demand on utility facilities. This increase could require the maintenance and replacement of outdated and deteriorated facilities. The City has a Capital Improvement Program that provides replacements and maintenance for the City's utility facilities.[49] This program is funded by the rates charged by the City to customers for utility services. Any such replacements or maintenance would comply with all applicable environmental regulations and would have a less than significant potential to contribute to a cumulative impact regarding utility facilities. (LTS)

Reduced Intensity Alternative B: Right-Size SHC and LPCH Facilities Plus Add Floor Area in an Amount Less Than the SUMC Project

Land Use

Conflicts with Applicable Land Use Designations and Zoning. Land use impacts associated with Reduced Intensity Alternative B would be similar to those identified for the SUMC Project. Development proposed under this alternative would require a Comprehensive Plan Amendment and rezoning of the Main SUMC Sites to accommodate proposed development intensities, which would be adopted prior to any construction. Proposed buildout would not, therefore, conflict with applicable development regulations and zoning. (LTS)

Conflicts with Comprehensive Plan Policies. With mitigation, no Comprehensive Plan policy conflicts were determined for the SUMC Project. Like the SUMC Project, this alternative would also require mitigation to ensure compliance with Comprehensive Plan policies that protect visual quality, pedestrian safety, historical resources, urban forest resources, groundwater and stormwater runoff, air quality degradation, and noise incompatibility. Also, this alternative would increase the number of hospital beds at the SUMC Sites. Therefore, Reduced Intensity Alternative B would address existing

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45 Debi Sargent, Solid Waste Contract Administrator, City of Sunnyvale, Public Works, electronic communication with PBS&J, November 10, 2008.

46 Guy Petraborg, Kirby Canyon Landfill, electronic communication with PBS&J, November 18, 2008.

47 City of Palo Alto, Water Supply Assessment for Stanford University Medical Center Facilities Renewal and Replacement Project, August 2009.

48 Rick Wetzel, Manager, Water Quality Control Plant in the Public Works Department, City of Palo Alto, electronic communication with PBS&J, November 26, 2007.

49 City of Palo Alto, http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=3954, accessed November 24, 2008.

local and regional demand for medical services and would partially address future demand. This would be consistent with Policy L-7, which requires new development to address regional needs and overall City welfare and objectives. As such, no conflict would occur with mitigation. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations
- TR-6.1: Bicycle and Pedestrian Infrastructure Improvements
- AQ-1.1: Implement Recommended Dust Control Measures
- AQ-1.2: Implement Diesel Emission Reduction Measures
- NO-1.1: Implement Best Management Practices to Reduce Construction Noise
- NO-4.1: Shield or Enclose HVAC Equipment and Emergency Generators
- BR-4.1: Prepare a Tree Preservation Report for all Trees to be Retained
- BR-4.2: Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks
- BR-4.3: Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention
- BR-4.4: Provide a Tree Preservation Bond/Security Guarantee
- BR-4.5: Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category
- CR-1.1: Manually Demolish Structures at the Hoover Pavilion Site
- CR-1.2: Prepare HABS Documentation for the Stone Building Complex
- CR-1.3: Prepare and Distribute Written and Photographic Documentation to Agencies
- CR-1.4: Prepare Permanent Interpretive Displays/Signage/Plaques
- CR-1.5: Implement Protection Documents for the Hoover Pavilion
- HW-3.1: Develop Workplan for any Unknown Contaminated Sites
- *No Net Increase in Runoff* (New mitigation measure not identified for the SUMC Project; see Hydrology analysis for this alternative.)

Compatibility with Adjacent Land Use Character and Conflicts with Established Residential, Recreational, Educational, Religious, or Scientific Uses in the Area. Although development on the SUMC Sites would be more intense than under current conditions, Reduced Intensity Alternative B would not introduce a new land use that would impede the function of surrounding land uses. No impact would occur, as for the SUMC Project. (NI)

Division of an Established Community and Farmland Conversion. The SUMC Project would have no impact on the division of an established community or farmland conversion. Similarly, Reduced Intensity Alternative B would not add physical barriers that might result in restriction of customary circulation patterns or a disruption of land use connectivity, nor would it require the acquisition and development of lands currently used for agricultural purposes. (NI)

Adverse Changes to Existing or Planned Land Use Pattern. Although amended land use designations and zoning would be required to implement Reduced Intensity Alternative B, this alternative would maintain the existing overall land use pattern and type of the Project Vicinity. However, Reduced Intensity Alternative B would intensify building massing within the SUMC Sites at a smaller extent than the SUMC project. This intensification of land uses would be isolated to the SUMC Sites; however, the surrounding visual character and views from sensitive viewer locations could be impacted. Without implementation of the City's Architectural Review process to ensure appropriate alignment of proposed structures, this increase in massing could have a significant impact on the existing character and intensity, although to a lesser extent than the SUMC Project. Implementation of Mitigation Measure VQ-2.1, as presented in the Visual Quality Section, would reduce the significant impacts on overall surroundings to a less-than-significant level. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Cumulative Impacts. This alternative, in combination with other reasonably foreseeable probable future development in the area, would have a less-than-significant cumulative impact on overall existing or planned land uses in the vicinity of the SUMC Sites. Any major development within the City, including this alternative and other adjacent projects, such as the construction of a three-story replacement medical office building at 777 Welch Road, would be subject to the City's Architectural Review process. Similarly, the SUMC Project would not contribute to a cumulative land use conflict. (LTS)

Visual Quality

Temporary Degradation of Visual Quality. Similar to the SUMC Project, there would be temporary but adverse visual impacts during the construction stage of Reduced Intensity Alternative B, resulting in a significant visual impact. However, the following mitigation measure, as presented for the SUMC Project, would reduce phased construction impacts to less than significant. (S/LTS)

- VQ-1.1: Implement Construction Visual Improvement Plan

Permanent Degradation of Visual Character Post Construction. Similar to the SUMC Project, Reduced Intensity Alternative B would increase on-site massing, reconfigure on-site layout, alter on-site landscaping and lighting, and incorporate new building materials and treatments. This would result in a significant impact. However, it would have a smaller impact than the SUMC Project because of its reduced amount of square footage and building mass. This alternative would increase on-site floor area by about 923,702 square feet, while the SUMC Project would increase floor area by approximately 1.3 million square feet. Like the SUMC Project, this alternative would have less-than-significant impacts with Mitigation Measure VQ-2.1, which requires compliance with the City's Architectural Review process and recommendations. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Alteration of Public Viewsheds, View Corridors, or Scenic Roads. Similar to the SUMC Project, Reduced Intensity Alternative B would increase on-site massing. This would result in a significant impact on views. However, since added floor area under Reduced Intensity Alternative B would reduce the amount of the added floor area under the SUMC Project, massing would be proportionately less. However, development under this alternative would not substantially degrade public view sheds, view corridors, or scenic roads if it would be required to undergo Architectural Review by the City, as required by the below mitigation measure. Therefore, with Architectural Review, impacts to views under Reduced Intensity Alternative B would be less than significant. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Terrain Modification. Since the SUMC Sites are relatively flat, Reduced Intensity Alternative B would have no impact on terrain modifications, as with the SUMC Project. (NI)

New Sources of Light and Glare. Reduced Intensity Alternative B, similar to the SUMC Project, would create a new significant source of light and glare. However, this alternative would have a smaller impact as it would only increase on-site floor area by about 923,702 square feet, which is fewer additional square feet than under the SUMC Project. Nonetheless, increased external lighting would be incorporated at the new medical buildings plus associated garages, within the vicinity of nearby sensitive viewers, such as the 1100 Welch Road apartments. In addition, the proposed parking structure at the Hoover Pavilion Site would introduce a new source of light to this area. Regardless, development under this alternative would not create a new source of substantial light or glare as it would be required to undergo Architectural Review by the City, as required in Mitigation Measure VQ-2.1, and adhere to Section 18.23.030 of the Municipal Code, which precludes significant glare and off-site spillage. Therefore, significant light and glare impacts under the Reduced Intensity Alternative B would be less than significant with the incorporation of the below mitigation measure. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Shadowing Public Open Spaces. Although new shadows would be cast under Reduced Intensity Alternative B, there would be fewer shadows than under the SUMC Project due to smaller building mass. This SUMC Project Alternative would have less-than-significant shadow impacts. In addition, the new shadows would not be cast over public open spaces; therefore, Reduced Intensity Alternative B would result in a less-than-significant impact, similar to the SUMC Project. (LTS)

Cumulative Impacts. As discussed in Section 3.3, Visual Quality, cumulative impacts associated with visual character, sensitive views, light and glare, and shadowing would less than significant. As less development would occur under Reduced Intensity Alternative B, cumulative impacts would remain less than significant. All projects in Palo Alto would be required to undergo Architectural Review by the City and adhere to Section 18.23.030 of the Municipal Code. (LTS)

Transportation

Under Reduced Intensity Alternative B, approximately 1.2 million square feet of existing building would be demolished and replaced with approximately 2.1 million square feet of new buildings. Parking Structure 3 would be replaced with a new underground structure, and additional new surface and structure spaces would also be constructed. The net effect of these changes would be an increase of approximately 923,702 square feet of building floor area. The number of hospital beds would increase by 86 at the new SHC Hospital structure, and by 62 at the new LPCH Hospital structure, for a total increase of 148 hospital beds. Compared to the SUMC Project, the net number of parking spaces would increase by 1,300 spaces, to a total of 2,000 spaces. The analysis of impacts under Reduced

Intensity Alternative B is based on the Alternatives Analysis prepared by AECOM Transportation (see Appendix M).[50]

Construction Impacts. During the demolition and construction phase, it is anticipated that traffic impacts would be primarily due to construction worker trips, the movement of heavy equipment that would be used for demolition and construction to and from the site, as well as material hauling. Although construction plans are not available, it is anticipated that the work would occur over several years, similar to the SUMC Project. The total number of construction related trips would vary from year to year depending on the type and intensity of construction work being performed. Regardless, the arrival and departure times for construction workers would remain the same and would primarily occur during off-peak hours, typically arriving before 7:00 a.m. and leaving before 4:00 p.m. The movement of heavy construction equipment such as cranes, bulldozers, and dump trucks to and from the site would also be scheduled, where possible, to occur during off-peak hours. However, there is the potential for conflicts between construction related traffic and traffic on the surrounding roadway network. With implementation of the following mitigation measures the significant construction related traffic impacts would be reduced to less-than-significant levels. (S/LTS)

- TR-1.1: Provide Off-Street Parking for Construction Related Vehicles
- TR-1.2: Maintain Pedestrian Access
- TR-1.3: Maintain Bicycle Access
- TR-1.4: Restrict Construction Hour
- TR-1.5: Restrict Construction Truck Routes
- TR-1.6: Protect Public Roadways During Construction
- TR-1.7: Maintain Public Transit Access and Routes
- TR-1.8: Prepare and Implement Construction Impact Mitigation Plan
- TR-1.9: Conduct Additional Measures During Special Events

Intersection LOS. Trip generation for the AM and PM Peak Hours for this alternative are approximately equivalent to 60 percent of the 2025 Buildout scenario of the SUMC Project. This alternative would result in a net increase of 486 vehicle trips in the AM Peak Hour and 469 vehicle trips in the PM Peak Hour. These trips result in significant impacts at four intersections during the AM Peak Hour and 10 intersections during the PM Peak Hour. Comparatively, the SUMC Project would significantly impact five intersections in the AM Peak Hour and 12 intersections in the PM Peak Hour.

Intersection improvements, such as adding turn lanes, changing how some lanes are used, and signalization would mitigate the significantly affected intersections under this alternative. However, the feasibility of implementing these improvements is uncertain. The City of Palo Alto has a stated policy which advocates a multi-modal approach to addressing traffic congestion as opposed to an approach that increases roadway capacity.

[50] AECOM Transportation, *Stanford University Medical Center Draft Environmental Impact Report Transportation Impact Analysis Alternatives Analysis,* March 2010.

A more viable approach to mitigation involves the implementation of several more feasible measures, each of which would contribute to a partial reduction in this alternative's impacts. These measures include the installation of traffic adaptive signal technology in selected corridors, the construction of two additional bicycle and pedestrian undercrossings in Palo Alto and Menlo Park, the provision of an enhanced TDM program to hospital employees, and implementation of those intersection improvements that are considered to be feasible.

- TR-2.1: Traffic Adaptive Signal Technology
- TR-2.2: Fund Additional Bicycle and Pedestrian Undercrossings
- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- TR-2.4: Fund or Implement those Intersection Improvements that Have Been Determined to be Feasible
- TR-2.5: Coordinate with Other Jurisdictions for Potentially Feasible Roadway Improvements

After implementation of the most effective combination of these measures, including Traffic Adaptive Signal technology, additional bicycle and pedestrian undercrossings, and an enhanced Stanford University TDM program, there would no longer be any adversely impacted intersections in the AM Peak Hour. However, there would still be two adversely impacted intersections in the PM Peak Hour. Therefore, even with the implementation of these measures, there would still be a significant and unavoidable impact on intersection LOS, although to a lesser extent than with SUMC Project. (S/SU)

Impacts on Roadway Segments. The SUMC Project would have a significant impact on five roadway segments in the City of Menlo Park in 2025. Reduced Intensity Alternative B would also have an adverse traffic impact on the same five roadway segments in 2025.

Implementation of Mitigation Measure TR-2.2, involving additional bicycle and pedestrian undercrossings, Mitigation Measure TR-2.3, involving an enhanced TDM program, and Mitigation Measure TR-7.2, involving financial contributions to the City of Menlo Park's shuttle fee, would reduce the number of vehicle trips that are made by SUMC employees. The level of reduction would not be enough to reduce the impact to a less than significant level for the SUMC Project. However, as mentioned above, Reduced Intensity Alternative B would generate less traffic than the SUMC Project, and implementation of these three mitigation measures would be enough to reduce the adverse impacts of this alternative on roadway segments in Menlo Park to a less-than-significant level. (S/LTS)

- TR-2.2: Fund Additional Bicycle and Pedestrian Undercrossings
- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- TR-7.2: Expand Public Transit Services

Local Circulation Impacts. The traffic projections for Welch Road for the Reduced Intensity Alternative B would be the same as for the SUMC Project. The future volumes would approach the capacity of a two-lane roadway with a center turn lane. The high volume of traffic, combined with the numerous turning vehicles, pedestrian movements across and along Welch Road and bicycle travel along Welch Road would potentially create a safety hazard, which is a significant impact.

Due to the shortness of the link, there is also the possibility that the queue to make the westbound left turn from Durand Way Extension to Sand Hill Road would back up all the way to the intersection of Welch Road and Durand Way. This would also be a significant impact.

The safety hazard on Welch Road can be mitigated by requiring the SUMC Project sponsors to fund an independent traffic study to determine whether the private street connection between Roth Way and Pasteur Drive should be operated as a public street. The purpose of this study will be to analyze circulation patterns around and through the medical complex to determine if the private street connection between Roth Way and Pasteur Drive should be operated as a public street for all vehicular, bicycle, pedestrian and transit traffic.

The overflowing queue on the Durand Way Extension can be mitigated by requiring the SUMC Project sponsors to pay for the development and implementation of a signing and striping plan for this roadway segment, and for the installation and optimization of the two signals at the intersections of Durand Way/Sand Hill Road and Durand Way/Welch Road.

- TR-4.1: Fund Traffic Impact Study
- TR-4.2: Fund Signing and Striping Plan and Signal Optimization

With implementation of these two measures, the potentially significant local circulation impacts would be reduced to less-than-significant levels under both this alternative and the SUMC Project. (S/LTS)

Freeway Impacts. The SUMC Project would have a less-than-significant impact on freeway LOS in 2025. The analysis of Reduced Intensity Alternative B, which would generate 60 percent as much traffic as the SUMC Project, indicates that this alternative would also have a less-than-significant impact on freeway LOS in 2025. (LTS)

Bicycle and Pedestrian Impacts. Bicycle and pedestrian traffic in and around the SUMC Sites is currently very extensive. Just as with the SUMC Project, Reduced Intensity Alternative B could result in an increased level of bicycle and pedestrian activity. Also, there would be increased intersection congestion due to this alternative. Both the increase in bicycle and pedestrian activity and project-generated traffic would result in an increase in hazards to pedestrian and bicyclists, which would be a significant impact under both the SUMC Project and this alternative. Mitigation involving bicycle and pedestrian intersection improvements would reduce the impact to less than significant. (S/LTS)

- TR-6.1: Bicycle and Pedestrian Infrastructure Improvements

Transit Impacts. Just as with the SUMC Project, Reduced Intensity Alternative B would increase on-site employment and visitorship, and this increase would in turn result in increased ridership on the routes serving the SUMC Sites. The resulting increase in ridership could exceed the capacity of the various transit services to and from the SUMC Sites. As such, the Reduced Intensity Alternative B could result in a significant impact on transit.

Furthermore, with implementation of the above mentioned Mitigation Measure TR-2.3 (enhancing the TDM program, including possible provision of Caltrain GO Passes or equivalent TDM measure to SUMC employees), it is expected that there would be a gradual mode shift, from commuting by automobile to commuting by public transit, by a significant percentage of hospital employees. This mode shift may take some amount of time to be realized, due to the fact that many people cannot immediately change their commuting habits. However, it is expected that the transit mode share for SUMC employees would gradually increase from the current 8.9 percent to 21.1 percent, and share of SUMC employees commuting by Caltrain would increase from 3.6 percent to approximately 16 percent. At this level of transit ridership, the level of auto use would be reduced to a level where many of the intersection impacts would be reduced to less-than-significant levels.

However, the success of the TDM program would also mean increased transit ridership. This increased ridership could push load factors above 1.0, indicating overcrowding on the buses. Impacts to transit service are considered a significant impact according to City of Palo Alto criteria.

Therefore, with implementation of the following mitigation measures involving the addition of two transit centers at LPCH and SHC, and the expansion of transit service, this alternative would have a less-than-significant transit impact, like the SUMC Project. (S/LTS)

- TR-7.1: Incorporate Transit Centers into Site Plans
- TR-7.2: Expand Public Transit Service

Parking Impacts. For Reduced Intensity Alternative B, the number of new spaces that will be needed for the project at 60 percent of buildout (1,381) plus the number of spaces needed to replace those demolished during construction (700) is 2,081. The number that would be supplied is slightly less than that. Approximately 2,000 parking spaces would be constructed to replace the 700 spaces demolished for construction and to add 1,300 parking spaces required for additional demand.

However, with implementation of the enhanced Travel Demand Management program (required under Mitigation Measure TR-2.3), the need for parking would be reduced. It is estimated that the enhanced TDM program could ultimately result in the need for 640 fewer parking spaces. Therefore, the revised demand would be 2,081 minus 640, which is equal to 1,441 spaces, which is well below the 2,000 spaces that would be supplied. With implementation of this mitigation measure, the parking impact of Reduced Intensity Alternative B would be reduced to a less than significant impact level. (S/LTS)

- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program

Emergency Impacts. Like the SUMC Project, this alternative would have a significant impact on emergency vehicle access due to the additional traffic it would add to intersections and roadway segments. This increase in congestion would add to the delay at intersections, and slow down the movement of ambulances and other emergency vehicles. The same emergency access mitigation identified in Section 3.4, Transportation, would reduce this alternative's impact to emergency access to a less-than-significant level. (S/LTS)

- TR-9.1: Pay Fair Share Towards OptiCom Installation

Cumulative Impacts. The traffic impacts that would result from implementation of Reduced Intensity Alternative B, like the SUMC Project, were estimated for post-construction (2025) conditions. The cumulative horizon is also 2025, the same as the project horizon. Therefore the cumulative traffic impacts and mitigation measures regarding intersections or freeway level of service, residential roadways, parking, bicycle and pedestrian access, and emergency vehicle access would be the same as the 2025 with Project scenario traffic impacts discussed above. As with the SUMC Project cumulative impact on transit would be less than significant since transit agencies would necessarily adjust the distribution of transit vehicles to accommodate demand.

Also, there would be significant cumulative impacts during construction of both the SUMC Project and Reduced Intensity Alternative B. Due to the intense construction required under Reduced Intensity Alternative B, this alternative's contribution to the cumulative impact would be considerable, like the SUMC Project. Mitigation Measures TR-1.1 through TR-1.9, as identified above, would reduce the contribution to less than cumulatively considerable. (S/LTS)

Air Quality

Construction Criteria Air Pollutant Emissions. Under Reduced Intensity Alternative B, large-scale activity/equipment use would still be required for demolition (i.e., the same floor area would be demolished as the SUMC Project), excavation/foundation work, and new building construction (about 70 percent of the floor area of the SUMC project). Although some reduction in the total number and duration of use over time of heavy duty equipment is likely, this alternative would likely have a similar intensity of construction during early construction phases along with the same significant equipment-related NO_x emissions identified for the SUMC Project. Reduced Intensity Alternative B would require the implementation of standard BAAQMD control measures for fugitive dust and diesel emissions just as the SUMC Project. However, although the below mitigation measures would reduce construction dust impacts to less-than-significant levels, NO_X emissions could remain significant and unavoidable, as with the SUMC Project. (S/SU)

- AQ-1.1: Implement Recommended Dust Control Measures
- AQ-1.2: Implement Diesel Emission Reduction Measures

Operational Criteria Air Pollutant Emissions. The new structures would contain new stationary pollutant sources, would require increased chilled water/steam from the Central Energy Facility with their associated air pollutant emissions, and would generate additional new motor vehicle trips with their associated air pollutant emissions, as shown in Table 5-9. However, such emissions would be less than the SUMC Project. Reduced Intensity Alternative B's NOx and PM_{10} emissions would remain significant, even after implementation of an enhanced TDM program (Mitigation Measure TR-2.3) or possibly the implementation of Mitigation Measure PH-3.1, which would reduce impacts to the jobs to employed residents ratio, similar to the SUMC Project. ROG emissions under the Reduced Intensity Alternative B would be below the BAAQMD's daily and annual significance thresholds, whereas the SUMC Project would result in significant and unavoidable emissions of ROG.

Table 5-9 Reduced Intensity Alternative B Daily Operational Stationary and Mobile Source Emissions (with mitigation)						
	Emissions (Pounds per Day/Tons per Year)					
Emission Source	**ROG**	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Stationary (On-Site)	3.40/0.62	3.52/0.64	3.87/0.71	0.00/0.00	0.01/0.00	0.01/0.00
Central Energy Facility	----	66/12.05	22.2/4.05	----	----	----
Mobile	47.52/ 8.38	57.41/ 9.78	538.18/ 98.84	1.45/ 0.24	244.75/ 44.66	46.00/ 8.39
Total Emissions	**50.92/ 9.01**	**126.93/ 22.47**	**564.25/ 103.60**	**1.45/ 0.24**	**244.76/ 44.66**	**46.01/ 8.39**
BAAQMD Thresholds	**80/15**	**80/15**	**NT**	**NT**	**80/15**	**NT**
Significant Impact?	**No/No**	**Yes/Yes**	**NT**	**NT**	**Yes/Yes**	**NT**

Source: PBS&J, 2010. Based on year 2025 emission factors.

Notes:

NT = No threshold.

Estimates are results of modeling using the CARB URBEMIS 2007 version 9.2.4.

This alternative would have a less-than-significant impact associated with localized concentrations of pollutants, such as CO, because no such air quality standard violations were noted for the SUMC Project in the model and this alternative would add proportionally less traffic to local streets. (S/SU)

- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- PH-3.1: Reduce the Impacts on the Jobs to Employed Residents Ratio

Construction and Operational TACs. The SUMC Project Health Risk Assessment evaluated TAC emissions from construction equipment and new operational sources (i.e., emergency diesel generators, delivery trucks, and additional medical helicopter flights/heliport) and found the associated health impacts to be less than significant. Under Reduced Intensity Alternative B, construction-phase TAC emissions would likely be proportionally lower because the use of diesel-powered construction equipment would be less than would be required for the SUMC Project. The operational sources of TACs identified for the SUMC Project (i.e., the diesel generators) likely result in less emissions than those evaluated in the SUMC Project Health Risk Assessment, since Reduced Intensity Alternative B would result in less floor area than the SUMC Project. Thus, construction and operational TAC impacts would be less than significant. (LTS)

Cumulative Impacts. The SUMC Project's emissions of NO_x during construction and of TACs during construction and operation were identified as making cumulatively considerable contributions to significant cumulative impacts. Under Reduced Intensity Alternative B, emissions of NO_x during construction would also potentially exceed the BAAQMD's 80 lbs/day threshold, and could contribute to significant cumulative impacts. The TACs emitted during construction and operation, though likely posing a lesser heath risk than those of the SUMC Project, would also make a cumulatively considerable contribution to the high TAC background levels of the area in which the SUMC Sites are located. Consequently, this alternative's cumulative TAC impacts would be cumulatively significant. The same construction-period Mitigation Measure AQ-1.2, mentioned above, would help reduce TAC emission from this alternative, but not to a less than considerable level. Consequently, this alternative's construction NO_x emissions and cumulative TAC impacts would be cumulatively significant. (S/SU)

Climate Change

Consistency with the Climate Protection Plan. Reduced Intensity Alternative B is assumed to include the Emissions Reduction Program proposed under the SUMC Project.

Construction Impacts. Under Reduced Intensity Alternative B, several structures would be fully or partially demolished and would be replaced by new structures, resulting in construction emissions. All buildings anticipated to be demolished under the proposed SUMC Project would be demolished under Reduced Intensity Alternative B, however some of the new buildings proposed in the SUMC Project would not be constructed or would be constructed with less square footage. Under Reduced Intensity Alternative B, construction emissions would be similar to the SUMC Project as both would involve intense development through 2025, although this alternative would have a lesser program than the SUMC Project. As such, this analysis conservatively assumes that construction emissions under this alternative would be similar to those of the SUMC Project. Construction emissions are regulated on a basin-wide basis, rather than for individual projects. Thus, the construction greenhouse gas emissions projected for the Reduced Intensity Alternative B would not be considered significant provided it incorporated the BAAQMD recommended reduction measures, which would be required as mitigation.

Operational Emissions. Reduced Intensity Alternative B would expand existing facilities, right-size existing inpatient facilities, and add new floor area for increased activity at the SUMC. The resulting activity levels (including trip generation) are anticipated to be approximately 60 percent of full buildout under the SUMC Project. Reduced Intensity Alternative B is assumed to include the Emissions Reduction Program proposed under the SUMC Project, as appropriate to the less intensive development program proposed under this alternative. These programs would address greenhouse gas emissions and further the policies of the Palo Alto Climate Protection Plan.

AB 32, the CARB's Scoping Plan, incorporates a 30 percent reduction target from 2020 BAU emissions limits. The City's Climate Protection Plan's incorporates this BAU approach to quantify emissions from significant, new projects which were not included in the City's existing inventory. As such, this analysis applies the 2020 reduction goal (equivalent to 30 percent below BAU) as a target threshold for compliance with the City Climate Protection Plan. This alternative is anticipated to result in approximately 75 percent of the emissions anticipated with the proposed SUMC Project or approximately 56,296 metric tons CO2e per year, which is a 25 percent increase from existing emissions. The Emissions Reduction Program would reduce greenhouse gas emissions by approximately 9 percent. Therefore, Reduced Intensity Alternative B must employ additional mitigation measures to further reduce emission impacts.

Mitigation applied to the SUMC Project would also apply to this alternative. Mitigation Measures CC-1.1 through CC-1.5, and TR-2.3, in Section 3.4, Transportation, would reduce Reduced Intensity Alternative B's greenhouse gas emissions and would further the policies of the Climate Protection Plan. In addition, the City shall consider the feasibility of Mitigation Measure PH-3.1, as identified in Section 3.13, Population and Housing.

- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- CC-1.1: Commissioning and Retro-Commissioning of Energy Systems for New and Existing Buildings.
- CC-1.2: Participation in Palo Alto Green Energy Program.
- CC-1.3: Annual Greenhouse Gas Reporting
- CC-1.4: Preparation of a Waste Reduction Audit
- CC-1.5: BAAQMD Construction Emission Reduction Measures
- PH-3.1: Reduce the Impacts on the Jobs to Employed Residents Ratio

Incorporation of the design features and mitigation measures would reduce emissions from Reduced Intensity Alternative B to 38,107 metric tons CO_2e per year, a reduction of 32.18 percent from the SUMC Project and 32.31 percent from BAU emissions. This reduction exceeds the 30 percent reduction from BAU emissions. Therefore, with incorporation of Mitigation Measures CC-1.1 through CC-1.4, TR-2.3 ,and possibly PH-3.1, Reduced Intensity Alternative B's contribution to global climate change would be less than cumulatively considerable. (S/LTS)

Result in Significant Emissions of Greenhouse Gases. With the implementation of all feasible mitigation measures, emissions reductions from Reduced Intensity Alternative B would exceed both the City of Palo Alto's Climate Protection Plan and the CARB's emission reduction goals of 30 percent below BAU emissions. Therefore, Reduced Intensity Alternative B would not emit significant amounts of Greenhouse gases and would not result in a cumulatively considerable contribution to global climate change. (S/LTS)

Noise

Construction Impacts. Under Reduced Intensity Alternative B, the types of construction activities would be similar to the SUMC Project, but the amount construction could be less. Nonetheless, impacts under this alternative would still be significant for on-site receptors. However, Mitigation Measure NO-1.1 would not reduce construction noise to less than significant. (S/SU)

- NO-1.1: Implement Best Management Practices to Reduce Construction Noise

Operational Impacts. Under Reduced Intensity Alternative B, operational noise from on-site HVAC equipment, emergency generators, and loading dock/parking facility operations would be similar to the SUMC Project. That is, there would be significant noise from mechanical equipment but Mitigation Measure NO-4.1 would reduce the impact to less than significant..

Medical helicopter flyovers and heliport locations would be similar to the SUMC Project and less than significant. The motor vehicle traffic noise under the SUMC Project would be less than significant, noise from this would be proportionally less, and therefore less than significant. However, the relocation of the ED would establish a new ambulance route on Sand Hill Road with consequent, significant noise impacts on the residential uses along Sand Hill Road, between El Camino Real and Durand Way. No feasible mitigation could be implanted to reduce the ambulance noise, given the urgent nature of ambulance activity. (S/SU)

- NO-4.1: Shield or Enclose HVAC Equipment and Emergency Generators

Cumulative Impacts. Cumulative noise impacts would be similar under this alternative and the SUMC Project. As with the SUMC Project, there would be significant cumulative construction noise with this alternative, both on site and off site. Mitigation Measure NO-1.1 would be warranted but would not reduce the contribution if this alternative to less than considerable. This alternative would result in significant and unavoidable construction noise impacts. Also, there would be no significant cumulative vibration impacts with the SUMC Project as well as this alternative. No other foreseeable project would generate ambulance noise and so there would be no cumulative impacts from ambulance noise. (S/SU)

Cultural Resources

Impacts on the Stone Building Complex. Like the SUMC Project, Reduced Intensity Alternative B would demolish the historic Stone Building complex. Implementation of the mitigation measures proposed for the SUMC Project, listed below, would reduce the cultural resources impacts resulting from demolition of the Stone Building complex; however the loss of the Stone Building complex would remain significant and unavoidable. (S/SU)

- CR.-1.2: Prepare HABS Documentation for the Stone Building complex
- CR.-1.3: Prepare and Distribute Written and Photographic Documentation to Agencies
- CR.-1.4: Prepare Permanent Interpretive Displays/Signage/Plaques

Impacts on the Hoover Pavilion. Under Reduced Intensity Alternative B, the Hoover Pavilion would be renovated and a structured parking garage would be constructed at the Hoover Pavilion Site to replace Parking Structure 3. Similar to the SUMC Project, but unlike the other SUMC Alternatives, the new construction would require the demolition of existing structures. Although vibrations have the potential to cause damage to the Hoover Pavilion, the vibration would be below the vibration threshold level at 25 feet away. However, similar to the SUMC Project, the demolition of the small sheds and storage facilities approximately 20 feet from the historic Hoover Pavilion could cause significant damage. The following mitigation measures, also proposed for the SUMC Project, would prohibit the use of equipment that could create potentially damaging vibration levels, reducing this impact to less than significant. (S/LTS)

- CR-1.1: Manually Demolish Structures at the Hoover Pavilion Site
- CR-1.5: Implement Protection Documents for the Hoover Pavilion

Impacts on Archaeological Resources and Human Remains. Prehistoric cultural resources and human remains have not been encountered within the site of Reduced Intensity Alternative B. As with the SUMC Project, it is possible, although unlikely, that archaeological resources and human remains could be encountered during Reduced Intensity Alternative B ground-disturbing activities. The following mitigation measures, as presented for the SUMC Project, would ensure that the impact remains less than significant. (S/LTS)

- CR-2.1: Construction Staff Training and Consultation
- CR-3.1: Conduct Protocol and Procedures for Encountering Human Remains

Impacts on Paleontological Resources. There have been significant paleontological finds in the immediate vicinity of the SUMC Sites. As with the SUMC Project, disturbance of any paleontological resources is a significant impact; however, the following mitigation measure, which is identified for the SUMC Project, would reduce the impact to less than significant. (S/LTS)

- CR-4.1: Conduct Protocol and Procedures for Encountering Paleontological Resources

Cumulative Impacts. Cumulative impacts on archaeological and paleontological resources and human remains from this alternative and adjacent development could be significant due to potential presence of these resources in the area. As with the SUMC Project, this analysis conservatively finds that this alternative would have a cumulatively considerable contribution to the cumulative impact. Mitigation measures described above would ensure that this alternative's contribution would be less than cumulatively considerable.

As described in Section 3.8 Cultural Resources, in addition to the Stone complex, E.D. Stone built three other buildings in Palo Alto; the Palo Alto Civic Center, Palo Alto Main Library, and Mitchell Park Library. The Palo Alto Civic Center and the Mitchell Park Library have both been evaluated by ARG. It was determined that both lacked sufficient integrity to qualify as historical resources. However, the Palo Alto Main Library has been determined eligible for the NRHP. Currently, plans call for renovation and expansion of the Main Library and the possible relocation of the City Police Department and Emergency Operations facilities from their current location within Palo Alto Civic Center to a new public safety building. Only one other E.D. Stone building in Palo Alto, the Palo Alto Main Library, which retains sufficient integrity to be eligible for listing. Therefore, the demolition of the Stone Building complex would comprise a considerable loss of an historical resource that is a unique and non-renewable member of a finite class. The demolition of the Stone Building complex would have a cumulatively considerable contribution due to the small body of E.D. Stone's work present in the City that retains sufficient integrity to be eligible as historical resources. The contribution of this alternative to the cumulative impact on historic resources would remain considerable, even with aforementioned mitigation measures. (S/SU)

Biological Resources

Special Status Plant or Wildlife Resources. The SUMC Sites are capable of supporting special-status plants. Buildings in the SUMC Sites could provide roosting habitat for Cooper's hawk, and special-status bat species known from the region. Removal of, or modification to, buildings containing active bat roosts could result in the loss of individual bats, bat colonies, or their habitat. Additionally, removal of trees could result in the loss of Cooper's hawk or their active nests. Reduced Intensity Alternative B would result in the demolition of the same onsite structures at the Main SUMC Site and the Hoover Pavilion Site as under the SUMC Project. Therefore, implementation of Reduced Intensity Alternative B, similar to the SUMC Project, could have a significant impact on Cooper's hawk and protected bat species. The following mitigation measure, as presented in Section 3.9, Biological Resources, would reduce Reduced Intensity Alternative B's impact on special-status and protected bats to a less-than-significant level. (S/LTS)

- BR-1.1: Conduct Pre-Demolition Survey
- BR-1.2: Avoid Roosting Areas
- BR-1.3: Develop and Employ Bat Nest Box Plan
- BR-1.4: Avoid Tree Removal During Nesting Season
- BR-1.5: Protect Cooper's Hawk in the Event of Nest Discovery

Loss of Riparian or Other Sensitive Habitats. Similar to the SUMC Project, Reduced Intensity Alternative B would have a less than significant impact on riparian habitats. It is unlikely that surface runoff or sedimentation from construction under Reduced Intensity Alternative B could reach the creek in a substantial enough quantity to affect riparian vegetation, or cause significant fill of the channel within San Francisquito Creek. Additionally, mitigation measures and Best Management Practices (BMPs) detailed in Section 3.11, Hydrology, would further reduce the potential for loss of riparian or wetland habitats due to sedimentation and erosion. Therefore, the Reduced Intensity Alternative B would also have a less-than-significant impact on the riparian habitat of San Francisquito Creek. (LTS)

Interference with Species Movement, Wildlife Corridors, or Nursery Sites. Similar to the SUMC Project, Reduced Intensity Alternative B would require the modifications to existing structures, and removal of on-site trees, which could be used by migratory birds as nursery sites including birds that nest on buildings (i.e., swallows, phoebes, etc.). However, fewer trees would be removed than under the SUMC Project since Reduced Intensity Alternative B would include a smaller footprint. Nonetheless, Reduced Intensity Alternative B could result in a significant impact to migratory bird nests. The following mitigation measures, as recommended for the SUMC Project, would reduce the impact to less than significant. (S/LTS)

- BR-3.1: Avoid Tree Removals or Building Demolition During Nesting Season
- BR-3.2: Protect Birds in the Event of Nest Discovery

Impacts on Protected Trees. Implementation of Reduced Intensity Alternative B could impact Protected Trees during preparation for building construction and would result in the loss of Protected Trees due to damage sustained during the construction phase. Since Reduced Intensity Alternative B would require a smaller building footprint area than the SUMC Project, this alternative would have less of an impact on Protected Trees, particularly for the Protected Trees in Kaplan Lawn. Nonetheless, Reduced Intensity Alternative B would still result in a significant impact, including on biologically and aesthetically significant Protected Trees at the FIM 1 Grove. The following mitigation measures, as identified for the SUMC Project, would reduce this alternative's impact on Protected Trees. However, these mitigation measures would not be able to avoid and preserve all Protected Trees; therefore, Reduced Intensity Alternative B would result in a significant and unavoidable impact. (S/SU)

- BR-4.1: Prepare a Tree Preservation Report for all Trees to be Retained
- BR-4.2: Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks

- BR-4.3: Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention
- BR-4.4: Provide a Tree Preservation Bond/Security Guarantee
- BR-4.5: Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category

Conflicts with an HCP or NCCP. The Santa Clara Valley HCP is the nearest adopted HCP/NCCP in the region, but the SUMC Sites are not included within its boundaries. The Stanford University HCP is currently in public review and has not been adopted. As such, similar to the SUMC Project, Reduced Intensity Alternative B would have no impact on an applicable HCP or natural communities conservation plan. (NI)

Cumulative Impacts. Cumulative development of past, current, and reasonably foreseeable probable future development, could negatively impact special-status bats, Cooper's hawk, and migratory birds, thus resulting in a significant cumulative impact on these resources. As discussed in Section 3.9, Biological Resources, the SUMC Project would have a less than considerable contribution to the cumulative impact. The size of disturbance within the SUMC Sites under Reduced Intensity Alternative B is smaller than the SUMC Project. This alternative's contribution to regional loss of urban habitat would thus be less than with the SUMC Project, and less than cumulatively considerable. Additionally, implementation of Mitigation Measures BR-3.1 and BR-3.2 would reduce the contribution of the SUMC Project to cumulative impacts on nesting birds.

However, there would be a significant cumulative impact on Protected Trees. Similar to the SUMC Project, even with implementation of mitigation measures discussed above, the contribution of Reduced Intensity Alternative B to the cumulative loss of Protected Trees would be cumulatively considerable. (S/SU)

Geology, Soils, and Seismicity

Exposure to Seismic-Related Hazards. Reduced Intensity Alternative B would have a less-than-significant potential to expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground-shaking, seismic-related ground failure (including liquefaction), landslides, or expansive soil. Compared to the SUMC Project, this alternative would have less development and thus a lesser risk of exposing persons or new structures to such hazards. (LTS)

Exposure to Other Geotechnical Hazards. Reduced Intensity Alternative B would have a less-than-significant potential to be located on a geologic units or on soil that is unstable, or that would become unstable as a result of the project and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. Compared to the SUMC Project, this alternative would have less development and thus a lesser risk of exposing persons or new structures to such hazards. (LTS)

Cause Substantial Erosion or Siltation. Reduced Intensity Alternative B would have a less-than-significant potential to cause substantial erosion or siltation. Compared to the SUMC Project, this alternative would have less development and thus a lesser degree of impact. (LTS)

Cumulative Impacts. Soil and geologic conditions are site-specific and there is little, if any, cumulative relationship between the SUMC Sites and other areas in the City. As such, the potential for cumulative impacts to occur is geographically limited for many geology and soils impact analyses. Reduced Intensity Alternative B would have a less-than-significant potential to cause cumulatively substantial erosion or siltation. Construction and operational activities embodied in Reduced Intensity Alternative B would be subject to the same regulation as the SUMC Project. Consequently, cumulative impacts would be less than significant. (LTS)

Hydrology

Flood Risks and Flood Flows. The SUMC Sites are not in a 100-year flood hazard area and therefore, as with the SUMC Project, there would be no impact from Reduced Intensity Alternative B regarding flood hazards and flood flows. (NI)

Groundwater Recharge and Local Water Table. As with the SUMC Project, no new groundwater supply wells would be implemented under Reduced Intensity Alternative B. If the new parking structure and/or replacement buildings were below or partially below ground surface, temporary groundwater dewatering may be necessary during construction. The effects of temporary groundwater dewatering during construction would not be expected to be substantially different from the SUMC Project. Therefore, as with the SUMC Project, Reduced Intensity Alternative B impact on direct lowering of the water table level would be less than significant.

Reduced Intensity Alternative B could increase the SUMC Sites impervious area, depending upon the site plan, thereby reducing the potential for long-term groundwater recharge compared to the SUMC Project and existing conditions. As explained in Section 3.11, Hydrology, the SUMC Sites are not in a significant groundwater recharge area and a confining layer separates the surface water table groundwater from the deep groundwater aquifer in the vicinity. Consequently, although Reduced Intensity Alternative B could reduce the potential for groundwater recharge compared to existing conditions and the SUMC Project, the potential would be a less-than-significant operational impact on groundwater recharge. (LTS)

Groundwater Quality. As with the SUMC Project, compliance with existing regulations would prevent the introduction of pollutants into infiltrating water during construction of Reduced Intensity Alternative B. However, similar to the SUMC Project, Reduced Intensity Alternative B's exposure of unknown contaminated soils to rainfall runoff or run-on and infiltration during construction could contribute to migration of these pollutants to groundwater. Additionally, as for the SUMC Project, construction activities on the Hoover Pavilion Site could alter the pollutant plume hydrology and contribute to plume movement, which could be a significant impact. The following mitigation measure, as identified for the SUMC Project, would reduce Reduced Intensity Alternative B's impact on groundwater quality to a less-than-significant level. (S/LTS)

- HW-3.1: Develop Workplan for any Unknown Contaminated Sites

Stormwater Runoff and Erosion and Streambank Instability. As with the SUMC Project, existing regulatory requirements would prevent substantial on-site erosion and off-site sediment transport from implementation of Reduced Intensity Alternative B. Therefore, similar to the SUMC Project, Reduced Intensity Alternative B impacts on on-site erosion and off-site sediment transport would be less than significant.

As explained in Section 3.11, Hydrology, the Santa Clara Municipal Regional Permit HM Standard set limitations on increases in peak stormwater runoff rate and volume in areas where increased impervious surfaces could contribute to stream bed or bank erosion. HM controls include such site design techniques as reducing impervious surface area, promoting infiltration and evapotranspiration, and introducing alternative site design. Since final detailed site plans are not fully developed, Reduced Intensity Alternative B could potentially have more impervious surfaces than the SUMC Project, and therefore, higher stormwater runoff rates. However, if Reduced Intensity Alternative B increases the amount of impervious surfaces above existing conditions, Reduced Intensity Alternative B would not be required to implement HM controls to prevent off-site erosion because it is in an area exempt from requiring HM controls. Therefore, unlike the SUMC Project, off-site erosion and streambank instability impacts because of increased runoff could be potentially significant because San Francisquito Creek is sediment impaired, which is a new significant impact of Reduced Intensity Alternative B.

If Reduced Intensity Alternative B is found to have more impervious surfaces than the SUMC Project, then the following mitigation measure would apply. This mitigation measure, which is not identified for the SUMC Project, would reduce the potential Reduced Intensity Alternative B impacts on off-site erosion to less-than-significant levels. (S/LTS)

- *No Net Increase in Runoff.* Prior to receiving a grading or building permit, the SUMC Project sponsors shall develop and implement a Final Site Plan that does not increase the amount of post construction stormwater runoff from the SUMC Site.

Flooding and Stormwater Conveyance Capacity. As mentioned above, unlike the SUMC Project, Reduced Intensity Alternative B could increase the amount of impervious surfaces that could contribute more stormwater runoff. However, Reduced Intensity Alternative B effects on flood event stormwater runoff would not be substantially different than the SUMC Project, which would be less than significant. Consequently, this increase would not substantially alter flood flows or stormwater conveyance capacities and the potential impacts on flooding and stormwater conveyance of Reduced Intensity Alternative B also would be less than significant. (LTS)

Degradation of Surface Water Quality. As with the SUMC Project, construction activities could introduce a risk for erosion and stormwater contamination that could affect water quality. Reduced Intensity Alternative B would be subject to existing regulations to prevent pollutants in stormwater runoff from construction and operation of the SUMC Project. Similar to the SUMC Project, Reduced Intensity Alternative B would be expected to replace more than 50 percent of the SUMC Sites' impervious surfaces and therefore, Reduced Intensity Alternative B would have to implement post-construction stormwater quality BMPs to treat entire SUMC Sites runoff. Consequently, the potential for degradation of surface water quality from implementation of Reduced Intensity Alternative B would be similar to the SUMC Project, and impacts on degradation of surface water quality would be less than significant. (LTS)

Dam Failure Inundation. Reduced Intensity Alternative B would increase the number of people with potential exposure to dam failure inundation compared to existing conditions. Reduced Intensity Alternative B would reduce the amount of people exposed to risk compared to the SUMC Project, and impacts associated with dam failure inundation would be less than significant, like the SUMC Project. (LTS)

Violation of Any Water Quality Standards or Waste Discharge Requirements (WDRs). Reduced Intensity Alternative B WDRs and water quality standards would be the same as for the SUMC Project. Similar to SUMC Project, existing City regulations, permitting process, and construction inspection ensures that projects would not violate WDRs and water quality standards. Consequently, as with the SUMC Project, Reduced Intensity Alternative B impacts regarding violation of water quality standards or WDRs would be less than significant. (LTS)

Cumulative Impacts. As discussed in Section 3.11, Hydrology, cumulative impacts associated with current and future growth and development within the San Francisquito Creek watershed, surface runoff and erosion, flooding and stormwater conveyance capacity, streambank instability, degradation of surface water and groundwater quality, dam inundation, and violation of water quality standards and WDRs would be less than significant. Cumulative impacts within the Santa Clara Valley Groundwater Subbasin, on groundwater recharge, and on the local water table would be less than significant with existing regulations and management. (LTS)

Hazardous Materials

Exposure to Hazardous Materials During Construction. Construction, demolition, and renovation associated with Reduced Intensity Alternative B could expose construction workers and the community to potential toxic contaminants associated with building materials, such as ACM. Additionally, building components containing PCBs, lead, and/or mercury could also be found in the buildings proposed to be demolished under this alternative. Exposure to these materials during construction, demolition, and renovation activities is considered a potentially significant impact, similar to the SUMC Project. However, adherence to all applicable health and safety requirements for these substances, along with the following mitigation measure as proposed for the SUMC Project, would ensure that potential exposure impacts are less than significant, similar to the SUMC Project.

- HM-2.1: Conduct Asbestos Survey at the SUMC Sites

Construction impacts under Reduced Intensity Alternative B would be similar to that described under Reduced Intensity Alternative A with regard to exposure to contaminated soil and groundwater at the 703 Welch Road site. However, under Reduced Intensity Alternative B, construction activities would also occur at the Hoover Pavilion Site to accommodate a new parking structure (as with the SUMC

Project). Therefore, significant impacts related to hazardous materials at this site could occur. The Phase I Assessment for the Hoover Pavilion Site concluded that potential petroleum contamination exists as a result of a leaking USTs and other underground piping (refer to HM-3 in Section 3.12, for further description of the Hoover Pavilion Site contamination). Quarterly groundwater monitoring has been conducted at this site from 1989 until 2001 and again in 2008. The monitoring concluded that the plume of dissolved-phase hydrocarbons in the diesel range was still existent, but was relatively stable.

Similar to the SUMC Project, Reduced Intensity Alternative B would entail demolition and excavation in potentially contaminated sites; therefore, impacts on construction personnel and the public due to exposure to contaminated soil and/or groundwater during construction activities are consider significant. Implementation of the following mitigation measures, as identified for the SUMC Project, would reduce the impacts to less than significant with respect to exposure of construction workers and the community to contaminated soil and groundwater during construction. (S/LTS)

- HM-3.2: Excavate Contaminated Soil from the 703 Welch Site
- HM-3.3: Conduct a Soil Vapor Program at the Hoover Pavilion Site
- HM-3.4: Develop a Site Management Plan for the Hoover Pavilion Site

Exposure to Hazardous Materials During Operation. Similar to the SUMC Project, operations at the new buildings in the Reduced Intensity Alternative B would include hazardous materials (such as flammable gas, oxidizers, and corrosive materials) and biohazardous materials (such as microorganisms, bacteria, and viruses). All uses, handling, and disposal of hazardous materials are highly regulated under existing federal, State, and local regulations. As such, compliance with all regulations would ensure that impacts associated with exposure to hazardous materials during operation activities under Reduced Intensity Alternative B remain less than significant, as with the SUMC Project. (LTS)

Safety Hazards to Schools. Like the SUMC Project, this alternative would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. No existing K-12 schools are located within one-quarter mile of the location of the SUMC Sites.

However, the LPCH includes an on-site school within the facility. The Reduced Intensity Alternative B would demolish and construct new buildings, and as such, could have the potential of increasing the amount of hazardous materials used on-site. Similarly to the SUMC Project, the Reduced Intensity Alternative B would be subject to regulation and operation practices that minimize hazard risks and would ensure that associated risks are not substantially increased. Consequently, impacts associated with hazardous materials exposure within one-quarter mile of an existing or proposed school, including the on-site school locate within the LPCH facility, would be less than significant. (LTS)

Wildfire Risk. As with the SUMC Project, this alternative would involve construction in a flat, urbanized area and therefore not in an area susceptible to significant grass, brush, or tree fires. As such, Reduced Intensity Alternative B would have no impact with regard to wildfire risk. (NI)

Safety Hazard from Public Airports. Similar to the SUMC Project, this alternative would not be located within the jurisdiction of any ALUP or within 2 miles of a public airport. Therefore, it would not expose worker and/or residents to a safety hazard from a public airport and no impacts would occur. (NI)

Emergency Response or Evacuation Plans. The demolition and construction phase of Reduced Intensity Alternative B would involve construction worker trips and the movement of construction trucks and heavy equipment, similar to the SUMC Project. Reduced Intensity Alternative B would use the same construction truck routes as the SUMC Project, many of which are identified as primary evacuation routes in the EOP and the Comprehensive Plan. As such, construction traffic could potentially interfere within emergency access along these routes, resulting in a significant impact. In addition, similar the SUMC Project, Reduced Intensity Alternative B would most likely upgrade utility infrastructure; therefore, road closures might occur under this alternative. Reduced Intensity Alternative B would also increase operational on-site activity compared to existing conditions, resulting in an increase in vehicular travel within the City, although to a lesser extent than the SUMC Project. Several intersections that would be impacted by Reduced Intensity Alternative B are designated as primary emergency evacuation and response routes. Due to additional traffic congestion at these intersections, travel time by emergency vehicles would increase, resulting in a significant impact. The below mitigation measures, as outlined for the SUMC Project, would reduce the impacts to emergency response and evacuation plans during construction and operation to less than significant. (S/LTS)

- HM-10.1: Coordinate Construction Activities with the City of Palo Alto
- TR-1.1: Provide Off-Street Parking for Construction Related Vehicles
- TR-1.4: Restrict Construction Hours
- TR-1.5: Restrict Construction Truck Routes
- TR-1.6: Protect Public Roadways During Construction
- TR-1.8: Prepare and Implement Construction Impact Mitigation Plan
- TR-9.1: Pay Fair Share Towards OptiCom Installation

Cumulative Impacts. As discussed in Section 3.12, Hazardous Materials, cumulative development would increase the use, storage, and handling of hazardous materials within the SUMC Sites and adjacent areas and also could increase risk of exposure at schools within a quarter mile of the SUMC Sites. However, these activities would be subject to laws and regulations pertaining to the handling, storage, and disposal of hazardous materials as described in Section 3.12. As such, cumulative impacts related to hazardous materials use, storage, and handling would be less than significant under both this alternative and the SUMC Project. With both the SUMC Project and this alternative, there would be no cumulative impacts related to construction of schools on contaminated property, hazards from wildland fires, or airport operations.

In replacing on-site structures, this alternative could expose workers to contaminants associated with building materials, such as asbestos, and could also disturb contaminated soils on site. The 777 Welch Road project, almost adjacent to the Main SUMC Site, would also potentially release contaminants associated with building materials, and potentially disturb previously contaminated soils, which are known to occur in the areas adjacent to the SUMC Sites. That project and this alternative could result in significant cumulative impacts. The contribution of Reduced Intensity Alternative B would be considerable given the extent of construction involved. Mitigation Measure HM-2.1 would involve measures to reduce exposure of persons to hazardous materials (such as asbestos). Mitigation Measures HM-3.1 through and HM-3.4, would involve investigations at other SUMC areas, remediation, and preparation of the Site Management Plan for remediation activities. These mitigation measures would reduce Reduced Intensity Alternative B's contribution to a less than cumulatively considerable level.

Construction of reasonably foreseeable projects within the City could involve increased intersection delays, resulting in significant cumulative construction-period impacts on emergency access. Reduced Intensity Alternative B's contribution to the cumulative impact on emergency response and evacuation plans would be cumulatively considerable. However, Mitigation Measures HM-10.1, TR-1.1, TR-1.4 through TR-1.6, and TR-1.8, would reduce Reduced Intensity Alternative B's contribution to cumulative impacts on emergency evacuation and response plans to less than cumulatively considerable. (S/LTS)

Population and Housing

Population Increases. Reduced Intensity Alternative B would not include the development of new housing units and would thus not directly increase the residential population within the region. However, as with the SUMC Project, there would be an indirect population increase associated with new visitorship and employment during construction and operation of Reduced Intensity Alternative B. The increase in employment would result in a demand for new housing units and an indirect increase in the residential population. However, the percentage of regional housing demand resulting from Reduced Intensity Alternative B would be relatively small in comparison with projected housing growth in the region. In addition, this alternative represents only a portion of the net population increase expected for the SUMC Project, which would have a less-than-significant impact. Therefore, the impact of Reduced Intensity Alternative B would be less than significant, as with the SUMC Project. (LTS)

Displacement of Housing. Similar to the SUMC Project, this alternative would have no impact on the displacement of existing housing as no housing exists on the SUMC Sites. (NI)

Jobs to Employed Residents Ratio. As discussed in Section 3.13, Population and Housing, the jobs to employed residents ratio impact is not, by itself, considered an environmental impact; however, it is analyzed because this impact would result in secondary environmental impacts on air quality and climate change. Specifically, as with the SUMC Project, Reduced Intensity Alternative B's impact on the jobs to employed residents ratio would result in increased commute traffic, which is a significant contributor to this alternative's significant and unavoidable impacts on air quality and climate change. As such, the analysis below identifies additional mitigation measures relating to the jobs to employed residents ratio, with additional measures the City can consider as a means for further mitigating those significant environmental impacts identified for air quality and climate change.

Reduced Intensity Alternative B would operate at about 60 percent of the SUMC Project. Per the Housing Needs Analysis (Appendix J), the SUMC Project under this alternative would increase employment by an additional 1,929 workers, adjusted for part time.[51] The currently projected jobs to employed residents ratio in 2025 (which is the year that Reduced Intensity Alternative B would reach its full buildout) is approximately 2.61 (without Reduced Intensity Alternative B). Adding the 1,929 new employees to the ratio of 2.61 jobs to employed residents within the City, Reduced Intensity Alternative B would increase the ratio by approximately 0.04, a ratio of about 2.65 jobs per employed resident.[52] This calculation is shown in Table 5-10.

Table 5-10
Reduced Intensity Alternative B Impact on City of Palo Alto Jobs to Employed Residents Ratio

Number of Projected Jobs in the City of Palo Alto in 2025	112,560
Number of Projected Employed Residents in 2025	43,160
Projected Jobs to Employed Residents Ratio in 2025	2.6079703
Reduced Intensity Alternative B Total Net Employment[a]	1,929
Number of Jobs to Increase the Jobs/Employed Residents Ratio More than 0.01[b]	432
Number of Jobs Generated by Reduced Intensity Alternative B Above and Over the 0.01 Ratio[c]	1,497
Resulting jobs to housing ratio with the SUMC Project[d]	2.6526645

Sources: ABAG 2005; KMA, 2009; City of Palo Alto, 2010.

Notes:

a. Adjusted for part-time.

b. 2.6079703 (existing 2025 jobs/housing ratio) + 0.01 x 43,160 (2025 employed residents) = 112,991.59. 112,991.59 jobs – 112,560 jobs (projected 2025 jobs within the City) = 431.6 = ~432 jobs

c. 1,929 (additional SUMC employees) – 432 (City threshold) = 1,497 jobs

d. 112,560 (2025 jobs) + 1,929 (additional SUMC employees) / 43,160 (2025 employed residents) = 2.6526645= ~2.65

Implementation of Mitigation Measure PH-3.1, as proposed for the SUMC Project, is not directly required in order to mitigate a significant environmental impact under Reduced Intensity Alternative B. Instead, this mitigation measure shall be considered as possible additional mitigation for impacts identified under air quality and climate change. However, it should be noted that these measures are presented only in conceptual terms, and the City may find that some or all of them are not feasible for various legal, practical, or other reasons. As such, this measure is presented for informational purposes, and to ensure that all possible options for mitigation of these impacts are adequately considered.

- PH-3.1: Reduce the Impacts on the Jobs to Employed Residents Ratio

Cumulative Impacts. ABAG Projections forecast the housing that would be built within each community up to 2025; therefore, the projections can be treated as cumulative housing development. As such, the cumulative analysis pertaining to indirect housing demand or increases in permanent

[51] Keyser Marston Associates, Inc., Final Proposed Stanford University Medical Center Expansion Housing Needs Analysis, prepared for the City of Palo Alto, September 2009.

[52] 112,560 jobs in 2025 + 1,929 jobs under Reduced Intensity Alternative B= 114,489 jobs/43,160 employed residents within the City = 2.65 jobs per employed resident

(residential) population is already provided above. In additions, as with the SUMC Project, cumulative development with this alternative would not have cumulative impacts on the City's jobs to employed residents ratio. (LTS)

Public Services

Demand for Fire Services. Like the SUMC Project, Reduced Intensity Alternative B would require an increased level of fire services due to increased employment and on-site activity. With more on-site activity there could be more incidents requiring fire department response. As with the SUMC Project at partial buildout, this alternative would require three additional full time staff and a new 100-foot ladder fire truck. However, the increased level of fire services would not be large enough to trigger the need for construction of new or expanded facilities that could adversely affect the physical environment or affect human health and safety. This alternative's impacts on fire services would be less than significant, like the SUMC Project. (LTS)

Demand for Police Services. Like the SUMC Project, Reduced Intensity Alternative B would require an increased level of police services due to increased employment and on-site activity. With more on-site activity there could be more incidents requiring police response. However, the increased level of police services would not be large enough to trigger the need for construction of new or expanded facilities that could adversely affect the physical environment or affect human health and safety. This alternative's impacts regarding police services would be less than significant, like the SUMC Project. (LTS)

Demand for Schools. Like the SUMC Project, this alternative does not involve the construction of new residential units in the City and therefore, would not directly generate students. Nonetheless, this alternative would indirectly generate student demand from induced housing caused by increased employment on the SUMC Sites. However, as with the SUMC Project, impacts from the indirectly generated students would be mitigated by payment of the school impact fees established by SB 50 by the SUMC Project and any subsequent residential projects. Therefore, Reduced Intensity Alternative B would result in a less-than-significant impact to schools. (LTS)

Demand for Parks and Recreation. Like the SUMC Project, this alternative would result in an increased demand and utilization of nearby parks and recreational services due to increased employment and on-site activity on the SUMC Sites. As such, this alternative could contribute to an existing deficit in parkland and contribute to accelerated deterioration of parkland; however, because the increase in worker population would not be substantial relative to City population, it is not likely that this alternative's demand would cause substantial deterioration of City parks. Additionally, as with the SUMC Project, the SUMC Project sponsors would be required to pay a "Community Facility Fee" under Reduced Intensity Alternative B, which has a line item for parks that would fund acquisition of land and improvements for neighborhood and district parks. Likewise, this alternative's contribution to the General Fund, through fees and taxes, would help finance the maintenance and upkeep of park and recreational facilities. Payment of these fees and taxes would mitigate this alternative's impacts on the City's park and recreational facilities. (LTS)

Cumulative Demand for Services. As discussed in Section 3.14, Public Services, cumulative impacts associated with past, current, and reasonably foreseeable probable future growth and development within the City of Palo Alto, with respect to fire protection and parks and recreational demands would be less than significant. Because this alternative would involve a lesser level of development compared to the SUMC Project, then cumulative impacts on fire protection and parks would also be less than significant with this alternative. However, cumulative demand on police service and schools could necessitate construction of new or expanded facilities, which could result in significant impacts. As discussed in Section 3.14, Public Services, the SUMC Project's contribution to the cumulative need for these new facilities would be less than cumulatively considerable. Because this alternative would involve a lesser level of development compared to the SUMC Project, then its contribution would also be less than considerable. (LTS)

Utilities

Water Demand. Like the SUMC Project, Reduced Intensity Alternative B would have less-than-significant impacts related to water supply. As stated in the description of Reduced Intensity Alternative B, this alternative would increase site activity compared to existing conditions, but to just approximately 60 percent of acidity under the SUMC Project. As stated in the Water Supply Assessment for the SUMC Project, at 2015, the SUMC Project would increase water demand by 0.11 million gallons per day.[53] The City's existing water transmission facilities have adequate capacity available to serve the increased demands of the SUMC Project. In addition, The City's WSCP would be implemented in progressive stages, as needed to achieve a positive balance of supplies and demands during drought years. Consequently, as with the SUMC Project, Reduced Intensity Alternative B would not cause the existing water supply facilities to experience substantial physical deterioration that would cause the need for their replacement. Therefore, the construction and operation of Reduced Intensity Alternative B would result in a less-than-significant impact related to water demand and the deterioration of water supply facilities. (LTS)

Wastewater Generation. The SUMC Project would increase average wastewater generation by 262,950 gallons per day.[54] Reduced Intensity Alternative B would increase average wastewater generation by 157,770 gallons per day.[55] As discussed in Section 3.15, Utilities, the SUMC Project would have less-than-significant impacts related to wastewater generation. Since Reduced Intensity Alternative B would generate less wastewater than the SUMC Project, this alternative would also result in less-than-significant impacts related to wastewater generation. Wastewater generated by Reduced

53 PBS&J, Final Water Supply Assessment for the Proposed Stanford University Medical Center Facilities Renewal and Replacement Project, August 24, 2009, Table 3-3.

54 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-1.

55 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-1.

Intensity Alternative B would be within the capacity of the existing system; therefore, it is unlikely that this alternative would contribute to any premature physical deterioration of the wastewater system. Consequently, as with the SUMC Project, Reduced Intensity Alternative B would not cause the existing wastewater facilities to experience substantial physical deterioration that would cause the need for their replacement. Therefore, the construction of Reduced Intensity Alternative B would result in a less-than-significant impact related to wastewater generation and the deterioration of wastewater facilities. (LTS)

Stormwater Generation. As discussed in Section 3.15, Utilities, the SUMC Project would have less-than-significant impacts related to stormwater collection system capacity. However, Reduced Intensity Alternative B may have more impervious surfaces than the SUMC Project, and therefore, increased stormwater flow than the SUMC Project. The Hydrology analysis for this alternative identified a mitigation that would prohibit an increase in post-construction stormwater runoff. With this measure, impacts related to stormwater facilities would be less than significant.

If Reduced Intensity Alternative B is found to have more impervious surfaces than the SUMC Project, then the following mitigation measure would apply. This mitigation measure, which is not identified for the SUMC Project, would reduce the potential Reduced Intensity Alternative B impacts related to stormwater facilities to less-than-significant levels. (S/LTS)

- *No Net Increase in Runoff.* Prior to receiving a grading or building permit, the SUMC Project sponsors shall develop and implement a Final Site Plan that does not increase the amount of post construction stormwater runoff from the SUMC Sites.

Solid Waste Generation. Reduced Intensity Alternative B would generate less solid waste than the SUMC Project. The solid waste facilities that would serve the SUMC Sites have sufficient remaining capacity to accommodate the SUMC Project. Therefore, the solid waste facilities that would serve the SUMC Sites would be sufficient to accommodate Reduced Intensity Alternative B and, thus, this alternative would not contribute to the need to expand existing or construct new solid waste disposal facilities. Since Reduced Intensity Alternative B would involve less development than the SUMC Project, this alternative would result in less-than-significant impacts related to solid waste generation. (LTS)

Energy Demand. The SUMC Project would increase peak power consumption by 9,040 kW.[56] After construction, Reduced Intensity Alternative B would consume less energy than the SUMC Project. As discussed in Section 3.15, Utilities, the SUMC Project would have a less-than-significant impact on natural gas and electrical facilities. Since Reduced Intensity Alternative B involves less development than the SUMC Project, it would also have a less-than-significant impact on energy facilities. With this alternative, the demand on energy has the potential to increase from current conditions because of the increase in square footage and on-site activity. Like the SUMC Project, this increase would require the installation of additional electrical feeder cables, which would occur within the same construction footprint as the SUMC Project. As discussed in Section 2, Project Description, the installation of the

[56] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-1.

additional feeder cables is considered a part of the project and impacts associated with this construction activity are analyzed throughout this document. Therefore, like the SUMC Project, Reduced Intensity Alternative B would result in a less-than-significant impact on energy facilities. (LTS)

Cumulative Demand for Utilities. As discussed in Section 3.15, Utilities, cumulative impacts related to solid waste facilities would be less than significant because the SMART Station and Kirby Canyon Landfill would have adequate capacity to serve their service area in 2025.[57, 58] Similarly, cumulative impacts related to water supply facilities are less than significant because the City plans to implement its WSCP in progressive stages, as needed to achieve a positive balance of supplies and demands. Therefore, the City can supply for its projected demands without exceeding SFPUC projected allocations or the City's SFPUC ISG.[59] Likewise, the RWQCP has adequate capacity to serve its service area in 2025.[60]

As discussed in Section 3.15, Utilities, the City's electricity, natural gas, and storm water drainage facilities have sufficient capacity to serve the cumulative development of the City in 2025. Future development in the City would generate an increased demand on utility facilities. This increase could require the maintenance and replacement of outdated and deteriorated facilities. The City has a Capital Improvement Program that provides replacements and maintenance for the City's utility facilities.[61] This program is funded by the rates charged by the City to customers for utility services. Any such replacements or maintenance would comply with all applicable environmental regulations and would have a less-than-significant potential to contribute to a cumulative impact regarding utility facilities. (LTS)

Tree Preservation Alternative

Land Use

Conflicts with Applicable Land Use Designations and Zoning. Land use impacts associated with the Tree Preservation Alternative would be similar to those identified for the SUMC Project. Development proposed under this alternative would require a Comprehensive Plan Amendment and rezoning of the Main SUMC Sites to accommodate proposed development intensities, which would be adopted prior to any construction. Proposed buildout would not, therefore, conflict with applicable development regulations and zoning. (LTS)

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57 Debi Sargent, Solid Waste Contract Administrator, City of Sunnyvale, Public Works, electronic communication with PBS&J, November 10, 2008.

58 Guy Petraborg, Kirby Canyon Landfill, electronic communication with PBS&J, November 18, 2008.

59 City of Palo Alto, Water Supply Assessment for Stanford University Medical Center Facilities Renewal and Replacement Project, August 2009.

60 Rick Wetzel, Manager, Water Quality Control Plant in the Public Works Department, City of Palo Alto, electronic communication with PBS&J, November 26, 2007.

61 City of Palo Alto, http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=3954, accessed November 24, 2008.

Conflicts with Land Use Policies. With mitigation, no Comprehensive Plan policy conflicts were determined for the SUMC Project. Like the SUMC Project, this alternative would also require mitigation to ensure compliance with Comprehensive Plan policies that protect visual quality, pedestrian safety, historical resources, urban forest resources, groundwater and stormwater runoff, air quality degradation, and noise incompatibility. Also, this alternative would include the same number of hospital beds as the SUMC Project. Therefore, the Tree Preservation Alternative would address local and regional demand for medical services. This would be consistent with Policy L-7, which requires new development to address regional needs and overall City welfare and objectives.

The Tree Preservation Alternative would also be consistent with Policy N-14, requiring the protection of the City's urban forest. This alternative would serve to protect as many biologically and aesthetically significant Protected Trees as feasible; however, several Protected Trees would still be removed under this alternative. Mitigation Measures BR-4.1 through BR-4.5 would reduce some of the impacts to Protected Trees at the SUMC Sites. While complete preservation of Protected Trees would not occur under this alternative, similar to the SUMC Project, this mitigation would fulfill the City's responsibility to protect, revitalize, and expand Palo Alto's urban forest. As such, no conflict would occur with mitigation. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations
- TR-6.1: Bicycle and Pedestrian Infrastructure Improvements
- AQ-1.1: Implement Recommended Dust Control Measures
- AQ-1.2: Implement Diesel Emission Reduction Measures
- NO-1.1: Implement Best Management Practices to Reduce Construction Noise
- NO-4.1: Shield or Enclose HVAC Equipment and Emergency Generators
- BR-4.1: Prepare a Tree Preservation Report for all Trees to be Retained
- BR-4.2: Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks
- BR-4.3: Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention
- BR-4.4: Provide a Tree Preservation Bond/Security Guarantee
- BR-4.5: Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category
- CR-1.1: Manually Demolish Structures at the Hoover Pavilion Site
- CR-1.2: Prepare HABS Documentation for the Stone Building Complex
- CR-1.3: Prepare and Distribute Written and Photographic Documentation to Agencies
- CR-1.4: Prepare Permanent Interpretive Displays/Signage/Plaques
- CR-1.5: Implement Protection Documents for the Hoover Pavilion
- HW-3.1: Develop Workplan for any Unknown Contaminated Sites
- *No Net Increase in Runoff* (New mitigation measure not identified for the SUMC Project; see Hydrology analysis for this alternative)

Compatibility with Adjacent Land Use Character and Conflicts with Established Residential, Recreational, Educational, Religious, or Scientific Uses in the Area. Although development on the SUMC Sites would be more intense than under current conditions, the Tree Preservation Alternative would not introduce a new land use that would impede the function of surrounding land uses. No impact would occur, as with the SUMC Project. (NI)

Division of an Established Community and Farmland Conversion. The SUMC Project would have no impact on the division of an established community or farmland conversion. Similarly, the Tree Preservation Alternative would not add physical barriers that might result in restriction of customary circulation patterns or a disruption of land use connectivity, nor would it require the acquisition and development of lands currently used for agricultural purposes. (NI)

Adverse Changes to Existing or Planned Land Use Pattern. Although amended land use designations and zoning would be required to implement the Tree Preservation Alternative, this alternative would maintain the existing overall land use pattern and type of the Project Vicinity. However, the Tree Preservation Alternative would intensify building massing within the SUMC Sites. This intensification of land uses would be isolated to the SUMC Sites; however, the surrounding visual character and views from sensitive viewer locations could be impacted. Without implementation of the City's Architectural Review process to ensure appropriate alignment of proposed structures, this increase in massing would have a significant impact on the existing character and intensity, as with the SUMC Project. Implementation of Mitigation Measure VQ-2.1, as presented in the Visual Quality Section, would reduce the significant impacts on overall surroundings to a less-than-significant level. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Cumulative Impacts. This alternative, in combination with other reasonably foreseeable probable future development in the area, would have a less-than-significant cumulative impact on overall existing or planned land uses in the vicinity of the SUMC Sites. Any major development within the City, including this alternative and other adjacent projects, such as the construction of a three-story replacement medical office building at 777 Welch Road, would be subject to the City's Architectural Review process. Similarly, the SUMC Project would not contribute to a cumulative land use conflict. (LTS)

Visual Quality

Temporary Degradation of Visual Quality. As with the SUMC Project, the Tree Preservation Alternative would construct new hospital and medical office/clinic facilities. Therefore, similar to the SUMC Project, there would be temporary but adverse visual impacts during the construction stage of the Tree Preservation Alternative, resulting in a significant visual impact. However, the following mitigation measure, as presented for the SUMC Project, would reduce phased construction impacts to less than significant. (S/LTS)

- VQ-1.1: Implement Construction Visual Improvements Plan

Permanent Degradation of Visual Character Post Construction. Similar to the SUMC Project, the Tree Preservation Alternative would increase on-site massing, reconfigure on-site layout, alter on-site landscaping and lighting, and incorporate new building materials and treatments. This would result in a significant impact. However, unlike the SUMC Project, the Tree Preservation Alternative would not construct a hospital module in Kaplan Lawn; therefore, the open space character of this area would be retained. Nonetheless, as with the SUMC Project, visual impacts would be significant and development under this alternative would be required to adhere to the below mitigation measure requiring compliance with the City's Architectural Review process and recommendations. With implementation of Mitigation Measure VQ-2.1, the Tree Preservation Alternative would not substantially degrade the existing visual character of the SUMC Sites or the surrounding area, resulting in a less-than-significant impact. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Alteration of Public Viewsheds, View Corridors, or Scenic Roads. In general, impacts of the Tree Preservation Alternative on views would be similar to the SUMC Project. That is, the Tree Preservation Alternative could result in significant impacts on views if it were not addressed properly through the City's Architectural Review Process. Figure 5-6 depicts views from Sand Hill Road. Under this alternative, the 64-foot hospital module in Kaplan Lawn (under the SUMC Project) would be absorbed into the main SHC Hospital building and therefore, this building would not be visible under the Tree Preservation Alternative. However, all four modules of the SHC clinic/medical office building would be 112 feet tall (as compared to the SUMC Project, which would have one module at 112 feet and three modules at 64 feet). Given the large increase in building mass under this alternative over existing conditions, there could be significant impacts on views from Sand Hill Road. To mitigate this significant impact, Mitigation Measure VQ-2.1 would be required, which mandates the Tree Preservation Alternative undergo Architectural Review by the City. Therefore, impacts to views under the Tree Preservation Alternative would be less than significant with mitigation. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations.

Terrain Modification. Since the SUMC Sites are relatively flat, the Tree Preservation Alternative would have no impact on terrain modifications, as with the SUMC Project. (NI)

New Sources of Light and Glare. The Tree Preservation Alternative, similar to the SUMC Project, would create a new source of light and glare, resulting in a significant impact. However, development under this alternative would be required to adhere to Section 18.23.030 of the Municipal Code, which precludes significant glare and off-site spillage and would ensure that the design limited such conditions. In addition, the Tree Preservation Alternative would undergo Architectural Review by the City, as required by Mitigation Measure VQ-2.1. Therefore, light and glare impacts under the Tree Preservation Alternative would be reduced to less than significant with mitigation. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

A Existing View

B Post-Construction View

Source: SUMC, 2010.

FIGURE 5-6
View of Tree Preservation Alternative, Looking South from Sand Hill Road and Pasteur Drive

Shadowing Public Open Spaces. New shadows would be cast under the Tree Preservation Alternative and the impacts are expected to be similar in scale to those of the SUMC Project since the increased floor area and building mass would be similar. However, the new shadows at the SUMC Sites would not be cast over public open spaces; therefore, the Tree Preservation Alternative would result in a less-than-significant impact, similar to the SUMC Project. (LTS)

Cumulative Impacts. As discussed in Section 3.3, Visual Quality, cumulative impacts associated with visual character, sensitive views, light and glare, and shadowing would be less than significant with the SUMC Project. As the Tree Preservation Alternative would have the same intensity of development as the SUMC Project, cumulative impacts would also be less than cumulatively significant. In addition, all projects in Palo Alto would be required to undergo architectural review by the City and adhere to Section 18.23.030 of the Municipal Code. (LTS)

Transportation

Construction Impacts. Impacts of this alternative would be similar to those of the SUMC Project because both scenarios would involve the same construction activities and duration. During the demolition and construction phase, it is anticipated that traffic impacts would be primarily due to construction worker trips, the movement of heavy equipment that would be used for demolition and construction to and from the site, as well as material hauling. Although construction plans are not available, it is anticipated that the work would occur over several years, similar to the SUMC Project. The total number of construction related trips would vary from year to year depending on the type and intensity of construction work being performed. Regardless, the arrival and departure times for construction workers would remain the same and would primarily occur during off-peak hours, typically arriving before 7:00 a.m. and leaving before 4:00 p.m. The movement of heavy construction equipment such as cranes, bulldozers, and dump trucks to and from the site would also be scheduled, where possible, to occur during off-peak hours. However, there is the potential for conflicts between construction related traffic and traffic on the surrounding roadway network. With implementation of the following mitigation measures the significant construction related traffic impacts would be reduced to less-than-significant levels. (S/LTS)

- TR-1.1: Provide Off-Street Parking for Construction Related Vehicles
- TR-1.2: Maintain Pedestrian Access
- TR-1.3: Maintain Bicycle Access
- TR-1.4: Restrict Construction Hours
- TR-1.5: Restrict Construction Truck Routes
- TR-1.6: Protect Public Roadways During Construction
- TR-1.7: Maintain Public Transit Access and Routes
- TR-1.8: Prepare and Implement Construction Impact Mitigation Plan
- TR-1.9: Conduct Additional Measures During Special Events

Operational Impacts. The building program under the Tree Preservation Alternative would be the same as with the SUMC Project. As such, the Tree Preservation Alternative would have the same impacts as the SUMC Project. There are some minor changes to the internal site plan under the Tree Preservation Alternative although these changes would have no implications on the analysis for the Main SUMC Project (see Section 3.4, Transportation, and Appendix C). The internal, on-site circulation changes relative to the SUMC Project include:

- Hospital Module Six would no longer be built but would instead be incorporated into the remaining five SHC Hospital modules;
- Construction of the new road through Kaplan Lawn; and
- Modification of on-site ambulance routes.

The above changes may slightly alter on-site mode split, especially for relatively short trips between hospital buildings. A slightly higher percentage of these trips may be made by walking, due to the following:

- Safer pedestrian entry to the SHC Hospital building;
- Reduction in conflicts between vehicles, bicyclists, and pedestrians; and
- Preservation of trees should make walking a more pleasurable experience.

However, even with these minor changes, the analysis in the Transportation Impact Analysis for the SUMC Project (Appendix C), would still apply to this alternative.

Intersection LOS. Trip generation for the AM Peak Hour and the PM Peak Hour for the Tree Preservation Alternative would be the same as the SUMC Project. There would be a net increase of 766 vehicle trips in the AM Peak Hour and 746 vehicle trips in the PM Peak Hour. These trips result in significant impacts at five intersections during the AM Peak Hour and 12 intersections during the PM Peak Hour.

The same intersection improvements listed for the SUMC Project, listed in Section 3.4, Transportation, would mitigate all of the significantly affected intersections under this alternative. However, several of these roadway capacity improvements are considered to be infeasible, and the Comprehensive Plan Policy T-27 discourages the addition of roadway capacity.

A more viable approach to mitigation involves the implementation of several more feasible measures, each of which would contribute to a partial reduction in this alternative's impacts. These measures include the installation of traffic adaptive signal technology in selected corridors, the construction of two additional bicycle and pedestrian undercrossings in Palo Alto and Menlo Park, the provision of an enhanced TDM program, and implementation of intersection improvements that are considered to be feasible. These measures may be combined as described in Section 3.4, Transportation. However, as indicated in Section 3.4, Transportation, even with the most effective combination of mitigation measures, the SUMC Project as well as this alternative would have a significant and unavoidable impact on three intersections. Therefore, the Tree Preservation Alternative would have significant and unavoidable impacts on intersection LOS, like the SUMC Project. (S/SU)

- TR-2.1: Traffic Adaptive Signal Technology
- TR-2.2: Fund Additional Bicycle and Pedestrian Undercrossings

- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- TR-2.4: Fund or Implement those Intersection Improvements that Have Been Determined to be Feasible
- TR-2.5: Coordinate with Other Jurisdictions for Potentially Feasible Roadway Improvements

Impacts on Roadway Segments. The Tree Preservation Alternative would contribute the same level of traffic to roadway segments as the SUMC Project. This would result in adverse traffic impacts to several roadway segments in the City of Menlo Park. Mitigation involves funding projects that would result in a shift in the mode of travel for SUMC employees, from automobile to walk, bike, bus, and train. These measures include providing additional bicycle and pedestrian undercrossings (Mitigation Measure TR-2.2), providing an enhanced TDM program (Mitigation Measure TR-2.3), and financial contributions to the City of Menlo Park's shuttle fee (Mitigation Measure TR-7.2).

However, even with implementation of these three measures, there would still be significant impacts on four Menlo Park roadways, including Marsh Road, Willow Road, Sand Hill Road, and Alpine Road. Therefore, just as with the SUMC Project, the traffic impacts to these roadway segments would remain significant and unavoidable with mitigation. (S/SU)

- TR-2.2: Fund Additional Bicycle and Pedestrian Undercrossings
- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- TR-7.2: Expand Public Transit Services

Local Circulation Impacts. The traffic projections for Welch Road for the Tree Preservation Alternative would be approximately the same as for the SUMC Project. The future volumes would approach the capacity of a two-lane roadway with a center turn lane. The high volume of traffic, combined with the numerous turning vehicles, pedestrian movements across and along Welch Road and bicycle travel along Welch Road would potentially create a safety hazard, which is a significant impact.

Due to the shortness of the link, there is also the possibility that the queue to make the westbound left turn from Durand Way to Sand Hill Road would back up all the way to the intersection of Welch Road and Durand Way. This would also be a significant impact.

The safety hazard on Welch Road can be mitigated by requiring the SUMC Project sponsors to fund an independent traffic study to determine whether the private street connection between Roth Way and Pasteur Drive should be operated as a public street. The overflowing queue can be mitigated by requiring the SUMC Project sponsors to pay for the development and implementation of a signing and striping plan for the Durand Way extension, and for the installation and optimization of the two signals at the intersections of Durand Way/Sand Hill Road and Durand Way/Welch Road. With implementation of these two measures, the potentially significant local circulation impacts would be reduced to less-than-significant levels under both this alternative and the SUMC Project. (S/LTS)

- TR-4.1: Fund Traffic Impact Study
- TR-4.2: Fund Signing and Striping Plan and Signal Optimization

Freeway Impacts. The SUMC Project would not contribute sufficient traffic to US 101 or I-280 to exceed level of service standards. The Tree Preservation Alternative is not anticipated to generate any additional freeway trips than the SUMC Project, and therefore, would also have a less-than-significant impact on freeway LOS. (LTS)

Bicycle and Pedestrian Impacts. Bicycle and pedestrian traffic in and around the SUMC Sites is currently very extensive. Like the SUMC Project, this alternative would increase bicycle and pedestrian activity around the SUMC Sites due to increased employment and visitorship. Also, there would be increased intersection congestion due to this alternative. Both the increase in bicycle and pedestrian activity and project-generated traffic would result in an increase in hazards to pedestrian and bicyclists, which would be a significant impact under both the SUMC Project and this alternative. Mitigation involving bicycle and pedestrian intersection improvements would reduce the impact to less than significant. (S/LTS)

- TR-6.1: Bicycle and Pedestrian Infrastructure Improvements

Transit Impacts. Just as with the SUMC Project, the Tree Preservation Alternative would increase on-site employment, and this increase would in turn result in increased ridership on the routes serving the SUMC Sites. The resulting increase in ridership could exceed the capacity of the various transit services to and from the SUMC Sites. As such, the Tree Preservation Alternative could result in a significant impact on transit.

Furthermore, with implementation of the above mentioned Mitigation Measure TR-2.3 (enhancing the TDM program), it is expected that there would be a gradual mode shift, from commuting by automobile to commuting by public transit, by a significant percentage of hospital employees. This mode shift may take some amount of time to be realized, due to the fact that many people cannot immediately change their commuting habits. However, it is expected that the transit mode share for SUMC employees would gradually increase from the current 8.9 percent to approximately 21.1 percent, and the share of SUMC employees commuting by Caltrain would increase from 3.6 percent to approximately 16 percent. At this level of transit ridership, the level of auto use would be reduced to a level where many of the intersection impacts are reduced to less-than-significant levels.

The success of the TDM program under Mitigation Measure TR-2.3 would also mean increased transit ridership. This increased ridership could push load factors above 1.0, indicating overcrowding on buses. Impacts to transit service in the Study Area are considered a significant impact according to City of Palo Alto criteria.

With implementation of the following mitigation measures involving the modification of project design to include the addition of two transit centers, and the expansion of public transit service, this alternative would have a less-than-significant transit impact, like the SUMC Project. (S/LTS)

- TR-7.1: Incorporate Transit Centers into Site Plans
- TR-7.2: Expand Public Transit Service

Parking Impacts. The number of parking spaces provided for the Tree Preservation Alternative would remain the same as under the SUMC Project. The Tree Preservation Alternative is also not anticipated to result in any additional demand for parking. The total demand will be 2,983 spaces, and a total of 2,985 spaces would be supplied. Therefore, this alternative would provide adequate on-site parking capacity, and would have a less-than-significant parking impact, as with the SUMC Project. (LTS)

Emergency Impacts. As indicated in Section 3.4, Transportation, as well as the Transportation Impact Analysis, the SUMC Project would have a significant impact on emergency vehicle access due to its increased roadway congestion. Because the Tree Preservation Alternative would also increase roadway congestion at the same level, this alternative would also have significant impacts on emergency vehicle access. The same emergency access mitigation identified in Section 3.4, Transportation, would reduce this alternative's impact on emergency access to a less-than-significant level. (S/LTS)

- TR-9.1: Pay Fair Share Towards OptiCom Installation

Cumulative Impacts. LOS impacts under the analysis above already account for cumulative growth through 2025 because this growth has been incorporated in the City of Palo Alto Travel Demand Forecasting Model, which is the basis for 2025 conditions. This growth is also accounted for in the above analysis of pedestrian, and emergency access impacts. Those analyses that incorporate cumulative growth in the City of Palo Alto Travel Demand Forecasting Model already capture a cumulative analysis, and no further cumulative discussions for those topics are provided here. Parking impacts are site-specific and do not cumulate with other projects. As such, the only transportation-related impacts to which a cumulative analysis applies are construction-period and transit impacts.

As with the SUMC Project, cumulative impacts on transit would be less than significant since transit agencies would necessarily adjust the distribution of transit vehicles to accommodate demand. However, there would be significant cumulative impacts during construction of both the SUMC Project and the Tree Preservation Alternative. Due to the intense construction required under the Tree Preservation Alternative, this alternative's contribution to the cumulative impact would be considerable, like the SUMC Project. Mitigation Measures TR-1.1 through TR-1.9, as identified above, would reduce the contribution to less than cumulatively considerable. (S/LTS)

Air Quality

Construction Criteria Pollutant Emissions. In contrast to the SUMC Project, the Tree Preservation Alternative's construction NO_x emissions, as shown in Table 5-11, would be less than significant. Under the SUMC Project, early stages of construction would result in significant emissions; under this alternative less diesel-powered equipment would be needed to construct the SHC Hospital garage during the early construction phases (less excavation would be needed since the a garage would be partially above ground). However, construction dust would be significant and would require mitigation. (S/LTS)

- AQ-1.1: Implement Recommended Dust Control Measures

Table 5-11
Tree Preservation Alternative Construction Equipment Exhaust Emissions

	Pollutant Emissions (Pounds per Day/Tons per Year)			
Emission Year	**ROG**	**NO_X**	**PM_{10}**	**$PM_{2.5}$**
2010	12.8/1.7	75.4/9.8	3.36/0.44	3.13/0.41
2011	11.2/1.5	70.9/9.2	2.93/0.38	2.72/0.35
2012	7.6/1.0	44.7/5.8	1.80/0.23	1.58/0.21
2013	4.7/0.6	27.8/3.6	1.10/0.14	1.00/0.13
2014	5.5/0.7	32.4/4.2	1.21/0.16	1.09/0.14
2015	4.5/0.5	26.2/3.4	0.94/0.12	0.88/0.11
2016	0.5/0.1	2.8/0.4	0.07/0.01	0.06/0.01
2017	1.9/0.3	11.4/1.5	0.30/0.04	0.26/0.03
2018	3.1/0.4	18.4/2.4	0.50/0.06	0.46/0.06
2019	3.1/0.4	18.4/2.4	0.50/0.06	0.46/0.06
2020	1.7/0.2	9.7/1.3	0.21/0.03	0.18/0.02
2021	1.4/0.2	8.2/1.1	0.19/0.02	0.16/0.02

Source: PBS&J, 2010.

Notes:

Estimates are results of modeling using CARB's off-road diesel equipment emission rates (established in CCR Article 48, Section 2449) and the URBEMIS 2007 computer model, together with project-specific equipment use and schedule data provided by the Whiting-Turner Contracting Company.

Operational Criteria Pollutant Emissions. The Tree Preservation Alternative would have the same development program as the proposed SUMC Project. Thus, it would result in the same motor vehicle trips, and its associated mobile source emissions would be the same as the SUMC Project. Therefore, this alternative would result in the same significant and unavoidable operational emissions of criteria air pollutants, even with mitigation that would reduce vehicle trips, as outlined below Also, like the SUMC Project, this alternative would have a less-than-significant impact on localized concentrations of CO. (S/SU)

- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- PH-3.1: Reduce the Impacts on the Jobs to Employed Residents Ratio

Construction and Operational TACs. The SUMC Project Health Risk Assessment evaluated TAC emissions from construction equipment and new operational sources (i.e., emergency diesel generators, delivery trucks, and additional medical helicopter flights/heliport) and found the associated health impacts to be less than significant. The Tree Preservation Alternative's construction-phase TAC emissions would result in lesser health risk than the SUMC Project (see Appendix O). TAC emissions under this alternative would be less than those of the SUMC Project during the early years of construction; however, TAC emission would be greater than those of the SUMC Project in the subsequent years when pile drivers would be used. Overall, the health risk to on-site and off-site receptors would be less since (1) the reduction of emissions in the early years of construction would offset the later increase in emissions, and (2) the increase in emission due to pile driving would occur in subsequent years, when construction equipment would emit less TACs, as required by law.

The operational sources of TACs associated with the Tree Preservation Alternative (i.e., the emergency diesel generators, truck loading docks and heliport) would be similar to those evaluated for the SUMC Project. In addition, the emergency diesel generators along Welch Road would be moved to a new location, which is closer to the center of the Main SUMC Site, and would be further away from off-site sensitive receptors. Thus, construction and operational TAC impacts for the Tree Preservation Alternative would be less than significant, as with the SUMC Project.[62] (LTS)

Cumulative Impacts. The SUMC Project's emissions of NO_x during construction and of TACs during construction and operation were identified as making cumulatively considerable contributions to significant cumulative impacts. Under the Tree Preservation Alternative**,** emissions of NO_x during construction would not exceed the BAAQMD's 80 lbs/day threshold, but could still contribute to significant cumulative impacts on future regional ozone levels. Similar to the SUMC Project, the TACs emitted during construction of the Tree Preservation Alternative would also make a cumulatively considerable contribution to the high TAC background levels of the area in which the SUMC Sites are located. Consequently, this alternative's cumulative TAC impacts would be cumulatively significant. Mitigation Measure AQ-1.2 would help reduce TAC emission from this alternative, but not to a less than considerable level. Consequently, this alternative's construction NO_x emissions and cumulative TAC impacts would be cumulatively significant. (S/SU)

- AQ-1.2: Implement Diesel Emission Reduction Measures

Climate Change

Consistency with the Climate Protection Plan. The Tree Preservation Alternative is assumed to include an Emissions Reduction Program, as with the SUMC Project. However, the Emissions Reduction Program alone would not ensure that the Tree Preservation Alternative would further the goals of the Climate Protection Plan.

Construction Impacts. During construction of the Tree Preservation Alternative, greenhouse gases would be emitted predominately through the operation of construction equipment. Under the Tree Preservation Alternative, Hospital Module Six would not be built and instead the square footage and programmatic functions proposed at this location would be incorporated into the remaining SCH hospital modules. Therefore, construction emissions are anticipated to be very similar to those described under the SUMC Project. Construction emissions are regulated on a basin-wide basis, rather than for individual projects. Thus, the construction greenhouse gas emissions projected for the Tree Preservation Alternative would not be considered significant provided it incorporated the BAAQMD recommended reduction measures, which would be required as mitigation.

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62 Environ, Memorandum to Trixie Martelino, February 19, 2010.

Operational Impacts. The net increase in floor area and activities under the Tree Preservation Alternative would be identical to that of the SUMC Project with the only difference being number of buildings and building layout. Therefore, greenhouse gas emissions with respect to the Tree Preservation Alternative are anticipated to be similar to that of the SUMC Project.

For the new and expanded hospital facilities, the Tree Preservation Alternative would include an Emissions Reduction Program for minimizing greenhouse gas emissions associated with new building construction and operation, similar to the SUMC Project. The programs implemented at the facilities would minimize greenhouse gas emissions at those facilities similarly to the proposed SUMC Project's reduction of approximately 6 percent. AB 32, the CARB's Scoping Plan, incorporates a 30 percent reduction target from 2020 BAU emissions limits. The City's Climate Protection Plan's incorporates this BAU approach to quantify emissions from significant, new projects which were not included in the City's existing inventory. As such, this analysis applies the 2020 reduction goal (equivalent to 30 percent below BAU) as a target threshold for compliance with the City Climate Protection Plan. Like to the SUMC Project this alternative would not meet the standard of reducing emission by 30 percent compared to BAU emissions. Therefore, the Tree Preservation Alternative must employ additional mitigation measures to further reduce emission impacts.

Mitigation applied to the SUMC Project would also apply to this alternative. Mitigation Measures CC-1.1 through CC-1.5, and TR-2.3, in Section 3.4, Transportation, would reduce the Tree Preservation Alternative's greenhouse gas emissions and would further the goals of the Climate Protection Plan. In addition, the City shall consider the feasibility of Mitigation Measure PH-3.1, as identified in Section 3.13, Population and Housing.

- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- CC-1.1: Commissioning and Retro-Commissioning of Energy Systems for New and Existing Buildings
- CC-1.2: Participation in Palo Alto Green Energy Program
- CC-1.3: Annual Greenhouse Gas Reporting
- CC-1.4: Preparation of a Waste Reduction Audit
- CC-1.5: BAAQMD Construction Emission Reduction Measures
- PH-3.1: Reduce the Impacts on the Jobs to Employed Residents Ratio

Notwithstanding all of these features that satisfy individual policies set forth in the Climate Change Plan, as with the SUMC Project, the Tree Preservation Alternative would still result in a significant overall increase in greenhouse gas emissions within the City, in contravention of the overall goals of the Climate Protection Plan. As emissions from the Tree Preservation Alternative would be similar to the SUMC Project, it is anticipated that, as with the SUMC Project, the reductions afforded by the proposed mitigation would not reduce emissions to a level 30 percent below BAU. Therefore, emissions from the proposed Tree Preservation Alternative are considered significant and unavoidable. (S/SU)

Result in Significant Emissions of Greenhouse Gases. Even with the implementation of all feasible mitigation measures, it is anticipated that emissions reductions afforded the Tree Preservation

Alternative would not achieve either the City of Palo Alto's Climate Protection Plan or the CARB's reduction emission goals of 30 percent below BAU emissions. Because these reduction levels cannot be achieved, the Tree Preservation Alternative would emit significant amounts of GHGs and would have a cumulatively considerable contribution to global climate change. (S/SU)

Noise

Construction Impacts. Under the Tree Preservation Alternative, the types of construction activities would be the same as the SUMC Project, except this alternative could include pile driving for the SHC Hospital. As with the SUMC Project, construction noise impacts under this alternative would still be significant for on-site receptors. But if pile driving is used for the SHC Hospital, construction noise impacts would also be significant for the closest off-site receptors. Noise from impact pile drivers can be in the mid-90s dBA at 50 feet[63] and decreasing to the high 70s dBA at 300 feet, which is the setback distance of the closest part of the SHC Hospital construction site from the 1100 Welch Road apartments. Thus, the maximum incremental effect of pile driving on ambient noise levels at the nearest off-site noise-sensitive use would be greater than 10 dBA, which is a significant impact.

Pile driving for the foundations of the new SHC Hospital structure could emit vibrations that may cause annoyance and structural damage within certain distances. Vibration from impact pile drivers would be just below 72 VdB at the 300-foot setback of the 1100 Welch Road apartments, which is the closest off-site sensitive receptor to the potential pile driving location. Thus, vibration levels would not exceed the FTA's 72 VdB threshold for "frequent" vibration events, and so the off-site annoyance impact of pile driving at the SHC Hospital site would be less than significant.

However, a structural damage threshold for structures similar to those on the SUMC Project site is 0.3 inch per second, as defined and recommended by the FTA.[64] This damage threshold could only be exceeded if impact pile drivers were to operate within 50 feet of such structures. Thus, there is little potential for structural damage to the closest off-site structures (i.e., the 1100 Welch Road apartments), which are about 300 feet away from the replacement SHC Hospital footprint, in which pile driving could be required under the Tree Preservation Alternative. However, the replacement SHC Hospital site is about 50 feet from the existing Blake-Wilbur Clinic Building, which would be retained under the Tree Preservation Alternative and would be in use throughout construction. The Blake-Wilbur Clinic was built fairly recently and would not be considered especially susceptible to damage from vibration. Vibration levels from impact pile driving within 50 feet of the Blake-Wilbur Clinic would be very close to 0.3 inch/second and, since the SHC Hospital site is about 50 feet from the Blake-Wilbur Clinic, the potential for significant vibration impact to the Blake-Wilbur Clinic could not be ruled out if impact pile driving occurs within the 25-foot-wide strip of the construction site that is closest to the Blake-Wilbur Clinic. Therefore, under this alternative, possible pile driving activities could annoy on-site and off-site receptors, and also damage on-site structures such as the Blake-Wilbur Clinic.

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63 See Table 3.7-9, *Average Noise Levels and Abatement Potential of Construction Equipment at 50 and 100 Feet*.

64 Federal Transit Administration, *Transit Noise Impact and Vibration Assessment*, May 2006, Table 12-3, *Construction Vibration Damage Criteria*.

Mitigation Measure NO-1.1 would be warranted for this alternative but would not reduce on-or off-site construction noise to less than significant levels. In addition to Mitigation Measure NO-1.1, the below mitigation measures, which are not identified for the SUMC Project, would reduce construction noise and vibration from pile driving. However, since the feasibility of these mitigation measures cannot be assured at present, potential annoyance to the 1100 Welch Road residents from pile driving noise must be considered significant and unavoidable. Since any structural damage to the Blake-Wilbur Clinic can either be avoided or repaired with the implementation of the third mitigation measure, vibration impacts to the Blake-Wilbur Clinic from pile driving would be less than significant. (S/SU)

- NO-1.1: Implement Best Management Practices to Reduce Construction Noise
- *Implement Best Management Practices to Reduce Construction Pile Driving Noise*. The SUMC Project sponsors shall incorporate the following practices into the construction documents to be implemented by the project contractor:
    a. Require construction contractors to use noise-reducing pile driving techniques, including pre-drilling pile holes (if feasible, based on soils) to the maximum feasible depth, installing intake and exhaust mufflers on pile driving equipment, vibrating piles into place when feasible, and installing shrouds around the pile driving hammer where feasible.
- *Implement Best Management Practices to Reduce Construction Pile Driving Vibration*. The SUMC Project Sponsors shall use sonic pile drivers to reduce vibration annoyance and/or damage to on-site sensitive receptors, if feasible.
- *Avoid or Repair Structural Damage to SUMC Structures*. *T*he SUMC Project sponsors shall:
    a. Use sonic pile drivers, if feasible, to avoid potential vibration damage to the closest on-site SUMC structures near the SHC Hospital and garage site; or
    b. Blake-Wilbur Clinic patients and workers shall be relocated to other, more-distant buildings during periods when pile driving occurs on parts of the SHC Hospital construction site within 75 feet of the Blake-Wilbur Clinic. The structural conditions of the Blake-Wilbur Clinic shall be assessed before and after pile driving by a licensed structural engineer and any damage resulting to the Blake-Wilbur Clinic from pile driving shall be completely repaired before patients and workers are allowed to return.

Operational Impacts. Operational noise from the Tree Preservation Alternative associated with HVAC equipment would be similar to that from the SUMC Project and would be mitigated to less-than-significant levels with implementation Mitigation Measure NO-4.1, which involves equipment shielding, as presented for the SUMC Project. However, the Tree Preservation Alternative would locate the emergency generators along Welch Road closer to the center of the Main SUMC Site and further away from off-site sensitive receptors compared to the SUMC Project. This increased distance would reduce their noise impact on off-site sensitive receptors, possibly to the point where shielding or enclosures would not be necessary to avoid significant impact. But implementation of Mitigation Measure NO-4-1, along with the generator noise measurements it calls for to determine baseline noise levels, would still be necessary to assure that the generator noise impact would be less than significant. The Tree Preservation Alternative would not worsen noise impacts associated with motor vehicle traffic, truck loading activities, and medical helicopters using the SUMC heliports, since the development program for the Tree Preservation Alternative would be the same as the SUMC Project. The Tree Preservation Alternative would include the same number of parking spaces as the SUMC Project, but instead of the underground parking structure at the Welch Road/Pasteur Drive intersection proposed under the SUMC Project, the Tree Preservation Alternative would construct a structure with three levels underground and four levels aboveground, along Welch Road. The inclusion of this aboveground parking garage could increase noise levels for residents across Welch Road, but the increased noise associated with this garage would not be significant. Relocation of the ED would be similar to the SUMC Project, and would add a major ambulance access route to Sand Hill Road with consequent significant unavoidable noise impacts to residential uses along Sand Hill Road between El Camino Real and Durand Way. (S/SU)

- NO-4.1: Shield or Enclose HVAC Equipment and Emergency Generators

Cumulative Impacts. Cumulative noise impacts would be similar under this alternative and the SUMC Project. As with the SUMC Project, there would be significant cumulative construction noise with this alternative, both on site and off site. Mitigation Measure NO-1.1 would be warranted but would not reduce the contribution if this alternative to less than considerable. This alternative would result in significant and unavoidable construction noise impacts. Also, there would be no significant cumulative vibration impacts with the SUMC Project as well as this alternative. No other foreseeable project would generate ambulance noise and so there would be no cumulative impacts from ambulance noise. (S/SU)

Cultural Resources

Impacts on the Stone Building Complex. The Tree Preservation Alternative would demolish the same buildings at the Main SUMC Site as the SUMC Project, including the entire Stone Building complex, which is the only historic resource that would be demolished. Implementation of the mitigation measures proposed for the SUMC Project, also listed below, would reduce some of the cultural resources impacts resulting from demolition of the Stone Building complex; however the loss of the Stone Building complex would remain significant and unavoidable. (S/SU)

- CR-1.2: Prepare HABS Documentation for the Stone Building complex
- CR-1.3: Distribute Written and Photographic Documentation to Agencies
- CR-1.4: Prepare Permanent Interpretive Displays/Signage/Plaques

Impacts on the Hoover Pavilion. As with the SUMC Project, the Tree Preservation Alternative would have potential construction vibration impacts that could damage the Hoover Pavilion. Although vibrations have the potential to cause damage to the Hoover Pavilion, the vibration would be below the vibration threshold level at 25 feet away. However, similar to the SUMC Project, the demolition of the small sheds and storage facilities approximately 20 feet from the historic Hoover Pavilion could cause significant damage. The following mitigation measures, also proposed for the SUMC Project, would prohibit the use of equipment that could create potentially damaging vibration levels, reducing this impact to less than significant. (S/LTS)

- CR-1.1: Manually Demolish Structures at the Hoover Pavilion Site
- CR-1.5: Implement Protection Documents for the Hoover Pavilion

Impacts on Archaeological Resources and Human Remains. As with the SUMC Project, it is possible, although unlikely, that archaeological resources and human remains could be encountered during ground-disturbing activities. The following mitigation measures, as identified for the SUMC Project, would ensure that the impact would be less than significant. (S/LTS)

- CR-2.1: Construction Staff Training and Consultation
- CR-3.1: Protocol and Procedures for Encountering Human Remains

Impacts on Paleontological Resources. There have been significant paleontological finds in the immediate vicinity of the SUMC Sites. As with the SUMC Project, disturbance of any paleontological resources is a significant impact; however, the following mitigation measure, which is presented for the SUMC Project, would reduce the impact to less than significant. (S/LTS)

- CR-4.1: Protocol and Procedures for Encountering Paleontological Resources

Cumulative Impacts. Cumulative impacts on archaeological and paleontological resources and human remains from this alternative and adjacent development could be significant due to potential presence of these resources in the area. As with the SUMC Project, this analysis conservatively finds that this alternative would have a cumulatively considerable contribution to the cumulative impact. Mitigation measures described above would ensure that this alternative's contribution would be less than cumulatively considerable.

As discussed in Section 3.8, Cultural Resources, cumulative development has had a pre-existing significant cumulative impact on other E.D. Stone structures in Palo Alto. Like the SUMC Project, the Tree Preservation Alternative would have a cumulatively considerable contribution to the cumulative impact by demolishing the Stone Building complex at the Main SUMC Site. Mitigation such as Mitigation Measures CR-1.2 through CR-1.5, involving documentation and protective measures, would reduce the impact on historic resources; however, the loss of the Stone Building complex would remain a cumulatively considerable contribution to the cumulative impact. (S/SU)

Biological Resources

Special Status Plant or Wildlife Resources. Habitat on the SUMC Sites capable of supporting special-status plants or wildlife is limited to roosting habitat for special-status bats and Cooper's hawk. Buildings in the SUMC Sites could provide roosting habitat for special-status bat species known from the region, and trees in the SUMC Sites could provide nesting habitat for Cooper's hawk. Removal of trees containing Cooper's hawk nests, or removal of, or modification to, buildings containing active bat roosts could result in the loss of individual Cooper's hawk, bats, bat colonies, or their habitat. Although the Tree Preservation Alternative would seek to preserve the majority of the aesthetically and biologically significant Protected Trees at Kaplan Lawn, the FIM 1 Grove, and along Welch Road, trees providing roosting and nesting habitat for Cooper's hawk and protected bats would still be removed (albeit at a lower intensity). Therefore, as with the SUMC Project, implementation of the Tree Preservation Alternative could have a significant impact on Cooper's hawk and protected bat species. The following mitigation measures, as presented in Section 3.9, Biological Resources, would reduce the Tree Preservation Alternative's impact on Cooper's hawk, and special-status bats to a less-than-significant level. (S/LTS)

- BR-1.1: Conduct Pre-Demolition Survey
- BR-1.2: Avoid Roosting Areas
- BR-1.3: Develop and Employ Bat Nest Box Plan
- BR-1.4: Avoid Tree Removal During Nesting Season
- BR-1.5: Protect Cooper's Hawk in the Event of Nest Discovery

Loss of Riparian or Other Sensitive Habitats. Similar to the SUMC Project, the Tree Preservation Alternative would have no impact on riparian habitats. While the Tree Preservation Alternative would seek to preserve the majority of the aesthetically and biologically significant Protected Trees at Kaplan Lawn, the FIM 1 Grove, and along Welch Road, construction of new buildings would still be required at the Main SUMC Site, thus resulting in a temporary increase in impervious area during construction. However, due to the distance from the creek, it is unlikely that surface runoff or sedimentation from construction under the Tree Preservation Alternative could reach the creek in a substantial enough quantity to affect riparian vegetation, or cause significant fill of the channel within San Francisquito Creek. Additionally, mitigation measures and BMPs detailed in Section 3.11, Hydrology, would further reduce the potential for loss of riparian or wetland habitats due to sedimentation and erosion. Therefore, the Tree Preservation Alternative would also have a less-than-significant impact on the riparian habitat of San Francisquito Creek. (LTS)

Interference with Species Movement, Wildlife Corridors, or Nursery Sites. The Tree Preservation Alternative would seek to preserve the majority of the aesthetically and biologically significant Protected Trees at Kaplan Lawn, the FIM 1 Grove, and along Welch Road which would reduce the total number of trees removed in comparison to the SUMC Project. However, similar to the SUMC Project, the Tree Preservation Alternative would still require the removal of on-site trees (albeit at a lower intensity), and modifications to existing structures, which could be used by migratory birds as nursery sites, including birds that nest on buildings (i.e., swallows, phoebes, etc.). Thus, the Tree Preservation Alternative could result in a significant impact to migratory bird nests. The following mitigation measures, as recommended for the SUMC Project, would reduce the impact to less than significant. (S/LTS)

- BR-3.1: Avoid Tree Removal or Building Demolition During Nesting Season
- BR-3.2: Protect Birds in the Event of Nest Discovery

Impacts on Protected Trees. The Tree Preservation Alternative would seek to retain as many Protected Trees as feasible. The SUMC Project would result in the removal of up to 71 Protected Trees, 23 of which are considered to be biologically and aesthetically significant, as discussed in more detail in Section 3.9, Biological Resources. The Tree Preservation Alternative would reduce the impact to Protected Trees, particularly the trees that are considered to be biologically and aesthetically significant as compared to the SUMC Project. However, this alternative would still result in the removal of up to 48 Protected Trees that do not fall under biologically and aesthetically significant distinction and the removal or relocation of an additional 10 biologically and aesthetically significant

Protected Trees. Therefore, although to a lesser extent than the SUMC Project, the Tree Preservation Alternative would still result in a significant impact to Protected Trees.

The Tree Preservation Alternative focuses on protecting the biologically and aesthetically significant trees located in the Kaplan Lawn, the FIM 1 Grove, and along Welch Road. Although the site plans for the SHC Hospital building, FIM 1, and circulation have been modified to retain and avoid as many biologically and aesthetically significant Protected Trees as possible, some would still need to be relocated or removed, as shown in Figure 5-1 and explained in more detail below:

- *Kaplan Lawn.* All nine existing Protected Trees in Kaplan Lawn would be retained in place and protected under this alternative.
- *FIM 1 Grove.* There are currently 12 Protected Trees in the FIM 1 Grove. Under the Tree Preservation Alternative, three trees would be retained and two trees would be relocated to a different location in the vicinity of the Main SUMC Site. The other seven biologically and aesthetically significant Protected Trees at the FIM 1 Grove would be removed.
- *Adjacent to Welch Road.* The century-old solitary oak located between Welch Road to the north and the Blake-Wilbur Clinic building to the south would be retained in place under this alternative. The mature and healthy Protected oak tree located to the east of the proposed LPCH hospital building, along Welch Road would be relocated to another area in the vicinity of the Main SUMC Site.

Overall, under the Tree Preservation Alternative, a total of up to 58 Protected Trees could be removed. Of these Protected Trees, 48 Protected Trees that are not considered biologically and aesthetically significant would be removed, seven biologically and aesthetically significant Protected Trees would be removed, and three biologically and aesthetically significant Protected Trees would be removed and relocated. While the Tree Preservation Alternative would seek to preserve three of the Protected Trees through relocation, the survival of these trees is not guaranteed; therefore, for the purposes of this analysis the trees are considered to be removed. As such, the removal of up to 58 Protected Trees would be a significant impact, although to a lesser extent than the SUMC Project, which would remove up to 71 Protected Trees. The following mitigation measures, as identified for the SUMC Project, would reduce the Tree Preservation Alternative's impact on Protected Trees to be retained and relocated to a less-than-significant impact. However, these measures would not be able to avoid the removal of up to 58 Protected Trees (three of which would be relocated) and therefore, even with the implementation of the below mitigation measures, the Tree Preservation Alternative would result in a significant and unavoidable impact. (S/SU)

- BR-4.1: Prepare a Tree Preservation Report for all Trees to be Retained
- BR-4.2: Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks
- BR-4.3: Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention
- BR-4.4: Provide a Tree Preservation Bond/Security Guarantee
- BR-4.5: Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category

Conflicts with an HCP or NCCP. The Santa Clara Valley HCP is the nearest adopted HCP/NCCP in the region, but the SUMC Sites are not included within its boundaries. The Stanford University HCP is currently in public review and has not been adopted. As such, similar to the SUMC Project, the Tree Preservation Alternative would have no impact on an applicable HCP or natural communities conservation plan. (NI)

Cumulative Impacts. Cumulative development of past, current, and reasonably foreseeable probable future development could negatively impact special-status bats, Cooper's hawk, and migratory birds, thus resulting in a significant cumulative impact on these resources. As discussed in Section 3.9, Biological Resources, the SUMC Project would have a less than considerable contribution to the cumulative impact. However, the extent of disturbance under the Tree Preservation Alternative is smaller than the SUMC Project. This alternative's contribution to regional loss of urban habitat would be less than with the SUMC Project. Therefore, as with the SUMC Project, implementation of mitigation measures for special-status bats and Cooper's hawk, the Tree Preservation Alternative's contribution to the regional loss of urban habitat for special-status bats and Cooper's hawk is less than cumulatively considerable.

However, there would be a significant cumulative impact on Protected Trees. Similar to the SUMC Project, even with implementation of mitigation measures discussed above, the contribution of the Tree Preservation Alternative to the cumulative loss of Protected Trees would be cumulatively considerable. (S/SU)

Geology, Soils, and Seismicity

Exposure to Seismic-Related Hazards. The Tree Preservation Alternative would have approximately the same less-than-significant potential as the SUMC Project to expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground-shaking, seismic-related ground failure (including liquefaction), landslides, or expansive soil.

Similar to the SUMC Project, the Tree Preservation Alternative would include the construction of new hospital buildings, clinical/medical offices, and above- and below-ground parking structures (not all in the same locations as the SUMC Project). Consequently, the hospital portion of the Tree Preservation Alternative would be required to meet the heightened safety standards of OSHPD 1, including the seismic requirements of HFSSA as amended by SB 1953. Implementation of these standards and criteria would minimize the risk of loss, injury, or death from seismic events through the requirement that the hospital building remain standing and be operational following a major earthquake. The design of the non-hospital portion of the Tree Preservation Alternative would be required to meet the standards contained in the then-current CBC. Because the newly constructed and retrofitted buildings under the Tree Preservation Alternative would be required to conform to current applicable OSHPD or City Building Code standards, they would not create any significant seismic hazards, soil instability hazards, or other hazardous geotechnical conditions.

The City would enforce the applicable OSPHD 3 or City Building Code requirements at buildings to be renovated, dependent on their re-use, providing protection from strong seismic ground-shaking, seismic-induced ground failure (including liquefaction), landslides, and expansive soils. The hospital portion of the Tree Preservation Alternative would be required to meet the strict safety standards established by OSHPD, including the seismic standards mandated in the HFSSA. With oversight responsibility vested in OSHPD FDD for the hospital buildings and in the City for the non-hospital buildings, there would be a very low probability that any design feature approved by either agency would have other than a less-than-significant potential to expose people or property to major geologic hazards. (LTS)

Exposure to Other Geotechnical Hazards. The Tree Preservation Alternative would have approximately the same less-than-significant potential as the SUMC Project to be located on a geologic units or on soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.

The regulatory environment providing protection from ground failures such as landslide (trench wall instability), lateral spreading (trench wall instability), subsidence, liquefaction, or collapse would be enforced by the City for the non-hospital buildings and by OSHPD FDD for hospital buildings. With oversight responsibility vested in OSHPD FDD for the hospital buildings and in the City for the non-hospital buildings, there would be a very low probability that any design feature approved by either agency would have other than a less-than-significant potential to expose people or property to on- or off-site landslide, lateral spreading, subsidence, liquefaction, or soil collapse.

Regarding pile driving, the design and construction of piles and pile foundations would be required to conform to Chapters 18 and 18A of the 2007 CBC (Sections 1808A, 1809A, and 1810A for hospital buildings and Sections 1808, 1809, and 1810 for non-hospital buildings), which require a foundation report giving specific information about the foundation support capacity of the geologic materials at the site and any other conditions expected to be encountered that could affect pile driving and the operational performance of the piles. Deep foundations may be driven piles, drilled shafts, micropiles, or cast-in-drilled-hole piles consisting of a single pile or groups of piles with a cap. The pile support may be end-bearing (resting on a competent geologic material) or friction (developing support from the resistance of the geological material through which it passes), depending on the competence of the materials at the Main SUMC Site, but must be designed to resist corrosion, lateral movement, downdrag, and static and dynamic uplift to account for deterioration, settlement, liquefaction, lateral spreading, uprooting, and overturning. (LTS)

However, ground-borne vibrations from impact pile driving during construction of the SHC Hospital building would have the potential to cause structural damage to nearby existing structures. Vibration damage from pile driving is addressed in the Noise analysis for this alternative.

Cause Substantial Erosion or Siltation. The Tree Preservation Alternative would have approximately the same less-than-significant potential as the SUMC Project to cause substantial erosion or siltation.

The Tree Preservation Alternative would involve construction activities similar to those that would be involved in the SUMC Project, including demolition of structures and surface parking; excavation and trenching for foundations, underground garages, and utilities; soil compaction and site grading; and the erection of new structures, all of which would disturb soils temporarily. The Tree Preservation Alternative would be required to comply with the same City and State regulations as the SUMC Project. With oversight responsibility vested in OSHPD FDD for the hospital buildings and in the City for the non-hospital buildings and other construction areas, there would be a very low probability that any design feature approved by either agency would have other than a less-than-significant potential to expose people, property, or downstream water courses to erosion and siltation hazards. (LTS)

Cumulative Impacts. Soil and geologic conditions are site-specific and there is little, if any, cumulative relationship between the SUMC Sites and other areas in the City. As such, the potential for cumulative impacts to occur is geographically limited for many geology and soils impact analyses. The Tree Preservation Alternative would have approximately the same less-than-significant potential as the SUMC Project to cause cumulatively substantial erosion or siltation. Construction and operational activities embodied in the Tree Preservation Alternative would be subject to the same regulation as the SUMC Project. Consequently, this alternative would not contribute to cumulative effects related to geology, soils, or seismicity. (LTS)

Hydrology

Flood Risks and Flood Flows. The SUMC Sites are not in a 100-year flood hazard area and therefore, as with the SUMC Project, there would be no impact from the Tree Preservation Alternative regarding flood hazards and flood flows. (NI)

Groundwater Recharge and Local Water Table. As with the SUMC Project, no new groundwater supply wells would be implemented under the Tree Preservation Alternative. The new Welch Road/Pasteur Drive parking structure would be underground and portions of other structures may be partially underground. Therefore, temporary groundwater dewatering may be required during construction. As with the SUMC Project, the Tree Preservation Alternative's impact on direct lowering of the water table level would be less than significant.

However, unlike the SUMC Project, the Tree Preservation Alternative could potentially increase the overall site impervious surfaces. As shown in the site plans for this alternative and described in more detail under the description of this alternative, the SHC Hospital building would include fewer green roofs than the SUMC Project, a new paved road that would travel down the middle of Kaplan Lawn, and a atrium at the SHC Hospital building instead of a courtyard with vegetation, as proposed under the SUMC Project. All of these new design features could result in a higher amount of impervious surfaces at the Main SUMC Site. As such, compared to the SUMC Project, the Tree Preservation Alternative could reduce the potential for long-term groundwater recharge at the Main SUMC Site. As explained in Section 3.11, Hydrology, the SUMC Sites are not in a significant groundwater recharge area and a confining layer separates the surface water table groundwater from the deep groundwater aquifer in the vicinity. Consequently, although the Tree Preservation Alternative could reduce the potential for groundwater recharge compared to the existing conditions, and possibly compared to the

SUMC Project, the potential would be a less-than-significant operational impact on groundwater recharge. (LTS)

Groundwater Quality. As for the SUMC Project, the Tree Preservation Alternative construction activities could alter pollutant plume hydrology and plume movement at the Hoover Pavilion Site. As with the SUMC Project, existing regulations would prevent the introduction of construction pollutants into infiltrating water during construction, and impacts on pollutant plume hydrology would be less than significant.

However, similar to the SUMC Project, the Tree Preservation Alternative exposure of potentially unknown contaminated soil to rainfall runoff or run-on during construction could allow for infiltrating water to pick up pollutants and carry them to underlying groundwater. The following mitigation measure, as identified for the SUMC Project, would reduce Tree Preservation Alternative impacts on groundwater quality to a less-than-significant level. (S/LTS)

- HW-3.1: Develop Workplan for any Unknown Contaminated Sites

Stormwater Runoff and Erosion and Streambank Instability. As with the SUMC Project, compliance with existing regulations would prevent substantial on-site erosion and off-site sediment transport from implementation of the Tree Preservation Alternative. Therefore, similar to the SUMC Project, Tree Preservation Alternative impacts on on-site erosion and off-site sediment transport would be less than significant.

As explained in Section 3.11, Hydrology, the Santa Clara Municipal Regional Permit HM Standard set limitations on increases in peak stormwater runoff rate and volume in areas where increased impervious surfaces could contribute to stream bed or bank erosion. HM controls include such site design techniques as reducing impervious surface area, promoting infiltration and evapotranspiration, and introducing alternative site design. The SUMC Project would reduce the amount of total impervious surfaces (pervious land surface plus green roofs); however, the Tree Preservation could increase the amount of impervious surfaces, as explained above. Since this alternative could have more impervious surfaces than the SUMC Project and existing conditions, higher stormwater runoff rates could result. If the Tree Preservation Alternative increased the amount of impervious surfaces above existing conditions, it would not be required to implement HM controls to prevent off-site erosion in San Francisquito Creek because it is in an area exempt from requiring HM controls. Consequently, impacts associated with increased runoff on off-site erosion could be significant because San Francisquito Creek is sediment impaired. This would be a new significant impact of the Tree Preservation Alternative.

If the Tree Preservation Alternative is found to have more impervious surfaces than the SUMC Project, then the following mitigation measure would apply. This mitigation measure, which is not identified for the SUMC Project, would reduce the potential Tree Preservation Alternative impacts on off-site erosion to less-than-significant levels. This measure is not identified for the SUMC Project. (S/LTS)

- *No Net Increase in Runoff.* Prior to receiving a grading or building permit, the SUMC Project sponsor shall develop and implement a Final Site Plan that does not increase the amount of post construction stormwater runoff from the SUMC Site.

Flooding and Stormwater Conveyance Capacity. As mentioned above, unlike the SUMC Project, the Tree Preservation Alternative could increase the amount of impervious surfaces that could contribute more stormwater runoff to the storm drain system and San Francisquito Creek. However, the Tree Preservation Alternative effect on flood event stormwater runoff would not be substantially different than the SUMC Project, which would be less than significant. Consequently, this would not substantially alter flood flows or stormwater conveyance capacities and the Tree Preservation Alternative impact on flooding and stormwater conveyance would be less than significant. (LTS)

Degradation of Surface Water Quality. Like the SUMC Project, existing regulations would prevent substantial transport of pollutants in stormwater runoff or to the sewer system by the Tree Preservation Alternative. Additionally, like the SUMC Project, the Tree Preservation Alternative may replace more than 50 percent of the SUMC Sites' impervious surfaces and therefore, the Tree Preservation Alternative would be required to implement post-construction stormwater quality BMPs to treat the entire SUMC Sites' runoff. Due to a potential increase in impervious surfaces, there is a slightly higher potential for pollutants in stormwater runoff to degrade surface water quality from implementation of the Tree Preservation Alternative compared to the SUMC Project. Nonetheless, as for the SUMC Project, Tree Preservation Alternative impacts on degradation of surface water quality would be less than significant. (LTS)

Dam Failure Inundation. As with the SUMC Project, the Tree Preservation Alternative would increase the exposure of people to dam failure inundation compared to existing conditions, but would not increase the number of people exposed to risk compared to the SUMC Project. Therefore, impacts associated with dam failure inundation would be less than significant. (LTS)

Violation of Any Water Quality Standards or Waste Discharge Requirements (WDRs). The Tree Preservation Alternative WDRs and water quality standards would be the same as for the SUMC Project. Similar to SUMC Project, existing City regulations, permitting process, and construction inspection ensures that WDRs and water quality standards would not be violated. Consequently, as with the SUMC Project, Tree Preservation Alternative impacts regarding violation of water quality standards or WDRs would be less than significant. (LTS)

Cumulative Impacts. As discussed in Section 3.11, Hydrology, cumulative impacts associated with current and future growth and development within the San Francisquito Creek watershed, surface runoff and erosion, flooding and stormwater conveyance capacity, streambank instability, degradation of surface water and groundwater quality, dam inundation, and violation of water quality standards and WDRs would be less than significant. Cumulative impacts within the Santa Clara Valley Groundwater Subbasin, on groundwater recharge, and on the local water table would be less than significant with existing regulations and management. (LTS)

Hazardous Materials

Exposure to Hazardous Materials During Construction. The Tree Preservation Alternative would demolish the same amount of floor space and construct the same amount of square feet of new buildings as under the SUMC Project. Construction, demolition, and renovation associated with the

Tree Preservation Alternative could expose construction workers and the community to potential toxic contaminants associated with building materials, such as ACM. Additionally, building components containing PCBs, lead, and/or mercury could also be found in the buildings proposed to be demolished under this alternative. Exposure to these materials during construction, demolition, and renovation activities is considered a potentially significant impact, similar to the SUMC Project. However, adherence to all applicable health and safety requirements for these substances, along with the following mitigation measure as proposed for the SUMC Project, would ensure that potential exposure impacts are less than significant, similar to the SUMC Project. (S/LTS)

- HM-2.1: Conduct Asbestos Survey at the SUMC Sites

Similar to the SUMC Project, the Tree Preservation Alternative would entail demolition and excavation at potentially contaminated sites (from known soil and groundwater contamination as described in Section 3.12, Hazardous Materials). Therefore, impacts on construction personnel and the public due to exposure to contaminated soil/and or groundwater during construction activities are considered significant. Implementation of the following mitigation measures, as identified for the SUMC Project, would reduce the impacts to less than significant with respect to exposure of construction workers and the community to contaminated soil and groundwater during construction. (S/LTS)

- HM-3.1: Perform a Phase II ESA for the 701 Welch Site
- HM-3.2: Excavate Contaminated Soil from the 703 Welch Site
- HM-3.3: Conduct a Soil Vapor Program at the Hoover Pavilion Site
- HM-3.4: Develop a Site Management Plan for the Hoover Pavilion Site

Exposure to Hazardous Materials During Operation. Similar to the SUMC Project, the Tree Preservartion Alternative would include hazardous materials (such as flammable gas, oxidizers, and corrosive materials) and biohazardous materials (such as microorganisms, bacteria, and viruses) as part of the hospitals' operation activities. All uses, handling, and disposal of hazardous materials are highly regulated under existing federal, State, and local regulations. As such, compliance with all regulations would ensure that impacts associated with exposure to hazardous materials during operation activities under the Tree Preservation Alternative would remain less than significant, as with the SUMC Project. (LTS)

Safety Hazards to Schools. Like the SUMC Project, this alternative would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. No existing K-12 schools are located within one-quarter mile of the location of the SUMC Sites.

However, the LPCH includes an on-site school within the facility. The Tree Preservation Alternative would demolish and construct new buildings, and as such, could have the potential of increasing the amount of hazardous materials used on-site. Similar to the SUMC Project, the Tree Preservation Alternative would be subject to regulation and operation practices that minimize hazard risks and would ensure that associated risks are not substantially increased. Consequently, impacts associated with hazardous materials exposure within one-quarter mile of an existing or proposed school, including the on-site school located within the LPCH facility, would be less than significant. (LTS)

Wildfire Risk. Similar to the SUMC Project, construction activities related to the Tree Preservation Alternative would occur outside the fire hazard zone, as identified in the City of Palo Alto Emergency Operations Plan.[65] Therefore, this alternative would not have an impact with regard to wildfire risk. No impacts would occur. (NI)

Safety Hazard from Public Airports. Similar to the SUMC Project, the Tree Preservation Alternative would not be located within the jurisdiction of any ALUP or within 2 miles of a public airport. Therefore, it would not expose worker and/or residents to a safety hazard from a public airport. As such, no impacts would occur. (NI)

Emergency Response or Evacuation Plans. The demolition and construction phase of the Tree Preservation Alternative would involve construction worker trips and the movement of construction trucks and heavy equipment, as under the SUMC Project. The Tree Preservation Alternative would use the same construction truck routes as the SUMC Project, many of which are identified as primary evacuation routes in the EOP and the Comprehensive Plan. As such, construction traffic would interfere within emergency access along these routes, resulting in a significant impact. In addition, as with the SUMC Project, the Tree Preservation Alternative would upgrade utility infrastructure; therefore, road closures would occur under this alternative. The Tree Preservation Alternative would also increase operational on-site activity compared to existing conditions, resulting in an increase in vehicular travel within the City. Several intersections that would be impacted by the Tree Preservation Alternative are designated as primary emergency evacuation and response routes. Similar to the SUMC Project, due to additional traffic congestion at these intersections, travel time by emergency vehicles would increase, resulting in a significant impact. The below mitigation measures, as outlined for the SUMC Project, would reduce the impacts to emergency response and evacuation plans during construction and operation to less than significant. (S/LTS)

- HM-10.1: Coordinate Construction Activities with the City of Palo Alto
- TR-1.1: Provide Off-Street Parking for Construction Related Vehicles
- TR-1.4: Restrict Construction Hours
- TR-1.5: Restrict Construction Truck Routes
- TR-1.6: Protect Public Roadways During Construction
- TR-1.8: Prepare and Implement Construction Impact Mitigation Plan
- TR-9.1: Pay Fair Share Towards OptiCom Installation

Cumulative Impacts. As discussed in Section 3.12, Hazardous Materials, cumulative development would increase the use, storage, and handling of hazardous materials within and around the SUMC Sites and also could increase risk of exposure at schools within a quarter mile of the SUMC Sites. However, these activities would be subject to laws and regulations pertaining to the handling, storage, and disposal of hazardous materials as described in Section 3.12. As such, cumulative impacts related to hazardous materials use, storage, and handling would be less than significant under both this alternative and the SUMC Project. With both the SUMC Project and this alternative, there would be

[65] City of Palo Alto, Emergency Operations Plan, June 2007.

no cumulative impacts related to construction of schools on contaminated property, hazards from wildland fires, or airport operations.

During demolition and excavation activities, this alternative could expose workers to contaminants associated with building materials, such as asbestos, and could also disturb contaminated soils on site. The 777 Welch Road project, almost adjacent to the Main SUMC Site, would also potentially release contaminants associated with building materials, and potentially disturb previously contaminated soils, which are known to occur in the areas adjacent to the SUMC Sites. That project and this alternative could result in significant cumulative impacts. The contribution of the Tree Preservation Alternative would be considerable given the extent of construction involved. Mitigation Measure HM-2.1 would involve measures to reduce exposure of persons to hazardous materials (such as asbestos). Mitigation Measures HM-3.1 through and HM-3.4, would involve investigations at other SUMC areas, remediation, and preparation of the Site Management Plan for remediation activities. These mitigation measures would reduce the Tree Preservation Alternative's contribution to a less than cumulatively considerable level.

Construction of reasonably foreseeable projects within the City could involve increased intersection delays, resulting in significant cumulative construction-period impacts on emergency access. The Tree Preservation Alternative's contribution to the cumulative impact on emergency response and evacuation plans would be cumulatively considerable. However, Mitigation Measures HM-10.1, TR-1.1, TR-1.4 through TR-1.6, and TR-1.8, would reduce the Tree Preservation Alternative's contribution to cumulative impacts on emergency evacuation and response plans to less than cumulatively considerable. (S/LTS)

Population and Housing

Population Increases. The Tree Preservation Alternative proposes the same amount of floor area as the SUMC Project. Since this increase is not significant, it is assumed that the net increase in direct employment and visitorship, and the indirect demand for housing, would be approximately the same as under the SUMC Project. Direct and indirect population increases would represent a small portion of the population projected by ABAG within the City of Palo Alto's sphere of influence and would therefore be less than significant. (LTS)

Displacement of Housing. Similar to the SUMC Project, this alternative would have no impact on the displacement of existing housing as no housing exists on the SUMC Sites. (NI)

Jobs to Employed Residents Ratio. As discussed in Section 3.13, Population and Housing, the jobs to employed residents ratio impact is not, by itself, considered an environmental impact; however, it is analyzed because this impact would result in secondary environmental impacts on air quality and climate change. Specifically, as with the SUMC Project, the Tree Preservation Alternative's impact on the jobs to employed residents ratio would result in increased commute traffic, which is a significant contributor to this alternative's significant and unavoidable impacts on air quality and climate change. As such, the analysis below identifies additional mitigation measures relating to the jobs to employed residents ratio, with additional measures the City can consider as a means for further mitigating those significant environmental impacts identified for air quality and climate change.

As shown in Table 3.13-6 in Section 3.13, Population and Housing, which would also apply to the Tree Preservation Alternative, 12,297 individuals would be employed at the SUMC, for a net increase of 2,417 employees. Adjusted for part time employment, the net increase under the Tree Preservation Alternative would result in 2,242 employees. This increase would result in total net added employee households of 1,303 households (Table 3.13-7).

The Tree Preservation Alternative would result in the same increase in employment as the SUMC Project. As with the SUMC Project, the Tree Preservation Alternative would be constructed and operational by 2025. The currently projected jobs to employed residents ratio in 2025 is approximately 2.61 (without the Tree Preservation Alternative).[66] Adding the 2,242 new employees to the ratio of 2.61 jobs to employed residents within the City, the Tree Preservation Alternative would increase the 2025 ratio by 0.05, resulting in a 2025 ratio of about 2.66 jobs per employed resident.[67] The Tree Preservation Alternative would result in the same jobs to employed residents ratio increase as the SUMC Project.

Implementation of Mitigation Measure PH-3.1, as proposed for the SUMC Project, is not directly required in order to mitigate a significant environmental impact under the Tree Preservation Alternative. Instead, this mitigation measure shall be considered as possible additional mitigation for impacts identified under air quality and climate change. However, it should be noted that these measures are presented only in conceptual terms, and the City may find that some or all of them are not feasible for various legal, practical, or other reasons. As such, this measure is presented for informational purposes, and to ensure that all possible options for mitigation of these impacts are adequately considered.

- PH-3.1: Reduce the Impacts on the Jobs to Employed Residents Ratio

Cumulative Impacts. ABAG Projections forecast the housing that would be built within each community up to 2025; therefore, the projections can be treated as cumulative housing development. As such, the cumulative analysis pertaining to indirect housing demand or increases in permanent (residential) population is already provided above. As with the SUMC Project, cumulative development with this alternative would not have cumulative impacts on the City's jobs to employed residents ratio. (LTS)

Public Services

Demand for Fire Services. Like the SUMC Project, the Tree Preservation Alternative would require an increased level of fire services due to increased employment and on-site activity. With more on-site activity there could be more incidents requiring fire department response. This alternative would

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[66] 112,560 jobs to 43,160 employed residents within the City = 2.61

[67] 112,560 jobs in 2025 + 2,242 jobs under the SUMC Project = 114,802 jobs/43,160 employed residents within the City = 2.66

involve the same amount of beds and employees as the SUMC Project; therefore, this alternative would require three additional full time staff and a new 100-foot ladder fire truck. However, the increased level of fire services would not be large enough to trigger the need for construction of new or expanded facilities that could adversely affect the physical environment or affect human health and safety. The impact of the Tree Preservation Alternative regarding fire services would be less than significant, like the SUMC Project. (LTS)

Demand for Police Services. The Tree Preservation Alternative would require an increased level of police services due to increased employment and on-site activity. As with the SUMC Project, more on-site activity would likely result in additional traffic accidents and other incidents that police officers may be required to respond to. However, the increased level of demand for police services would not be large enough to trigger the need for construction of new or expanded facilities that could adversely affect the physical environment or affect human health and safety. Therefore, like the SUMC Project, this alternative's impacts regarding police services would be less than significant. (LTS)

Demand for Schools. Similar to the SUMC Project, the Tree Preservation Alternative would not involve the construction of new residential units in the City and therefore, would not directly generate students. Nonetheless, this alternative would indirectly generate students from induced housing caused by increased employment on the SUMC Sites. However, impacts from the indirectly generated students would be mitigated by payment of the school impact fees established by SB 50. (LTS)

Demand for Parks and Recreation. Similar to the SUMC Project, the Tree Preservation Alternative would result in an increased demand and utilization of nearby parks and recreational services due to increased employment and on-site activity on the SUMC Sites.[68] The Tree Preservation Alternative would be required to pay a "Community Facility Fee," which has a line item for parks that would fund acquisition of land and improvements for neighborhood and district parks.[69] Likewise, this alternative's contribution to the General Fund, through fees and taxes, would help finance the maintenance and upkeep of park and recreational facilities. Like the SUMC Project, payment of these fees and taxes would mitigate the Tree Preservation Alternative's impacts on City parks and recreational facilities to a less-than-significant level. (LTS)

Cumulative Demand for Services. As discussed in Section 3.14, Public Services, cumulative impacts related to fire protection and parks and recreational demands would be less than significant. Because this alternative would involve the same level of development compared to the SUMC Project, then cumulative impacts related to fire protection and parks would also be less than significant with this alternative. However, cumulative demand on police service and schools could necessitate construction of new or expanded facilities, which could result in significant impacts. As discussed in Section 3.14, Public Services, the SUMC Project's contribution to the cumulative need for these new facilities would be less than cumulatively considerable. Because this alternative would involve the same level of

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68 DMG-Maximus, City of Palo Alto, Parks and Community Facilities Impact Fee Study, September 18, 2001.

69 City of Palo Alto, Municipal Codes, Section 16.58, Building Regulations, http://nt2.scbbs.com/cgi-bin/om_isapi.dll?clientID=277797042&infobase=procode-3&softpage=Browse_Frame_Pg, accessed, January 14, 2008.

development compared to the SUMC Project, then its contribution would also be less than considerable. (LTS)

Utilities

Water Demand. Like the SUMC Project, the Tree Preservation Alternative would have less-than-significant impacts related to water supply. During years of above-normal and normal water supply, the City has sufficient supplies to meet the demands of the Tree Preservation Alternative. During single and multiple dry years, City water supplies from SFPUC are insufficient to meet demands. These supply deficiencies can be met with the implementation of the WSIP, EWSS projects, and dry year demand reductions in accordance with the WSCP. The City's WSCP would be implemented in progressive stages, as needed to achieve a positive balance of supplies and demands during drought years.

This alternative involves the same amount of development as the SUMC Project, including the same amount of beds and employees. Therefore, this alternative would not require the City to create new or expanded entitlements for water supplies. Also, Stanford has indentified a long list of conservation measures that it proposes to implement to help reduce the water demands of the SUMC project (which would apply to the Tree Preservation Alternative as well); these measures may be imposed as conditions of SUMC Project approval. Therefore, this alternative would result in less-than-significant impacts related to water demand. (LTS)

Wastewater Generation. As with the SUMC Project, the Tree Preservation Alternative would increase average wastewater generation by 262,950 gallons per day.[70] As discussed in Section 3.15, Utilities, the SUMC Project would have less-than-significant impacts related to wastewater generation. The Tree Preservation Alternative would involve the same amount of water use (and associated wastewater generation) as the SUMC Project; therefore, this alternative would not require the expansion or installation of wastewater facilities. As with the SUMC Project, the Tree Preservation Alternative would not cause the existing wastewater facilities to experience substantial physical deterioration that would cause the need for their replacement. Therefore, the construction of the Tree Preservation Alternative would result in a less-than-significant impact related to wastewater generation and the deterioration of wastewater facilities. (LTS)

Stormwater Generation. As discussed in Section 3.15, Utilities, the SUMC Project would have less-than-significant impacts related to stormwater collection system capacity. However, as explained under the Hydrology analysis, the Tree Preservation Alternative may have more impervious surfaces than the SUMC Project, and therefore, increased stormwater flow than the SUMC Project. The Hydrology analysis for this alternative identified a mitigation that would prohibit an increase in post-construction stormwater runoff. With this measure, impacts related to stormwater facilities would be less than significant.

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[70] Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-1.

If the Tree Preservation Alternative is found to have more impervious surfaces than the SUMC Project, then the following mitigation measure would apply. This mitigation measure, which is not identified for the SUMC Project, would reduce the potential Tree Preservation Alternative impacts related to stormwater facilities to less-than-significant levels. (S/LTS)

- *No Net Increase in Runoff.* Prior to receiving a grading or building permit, the SUMC Project sponsors shall develop and implement a Final Site Plan that does not increase the amount of post construction stormwater runoff from the SUMC Sites.

Solid Waste Generation. As discussed in Section 3.15, Utilities, the solid waste facilities that would serve the SUMC Sites have sufficient remaining capacity to accommodate the SUMC Project. Therefore, the solid waste facilities that would serve the SUMC Sites would be sufficient to accommodate the Tree Preservation Alternative and, thus, this alternative would not contribute to the need to expand existing or construct new solid waste disposal facilities. Since the Tree Preservation Alternative would involve the same amount of development as the SUMC Project and would not involve a greater amount of beds or employees, this alternative would result in less-than-significant impacts related to solid waste generation. (LTS)

Energy Demand. The SUMC Project would increase peak power consumption by 9,040 kW.[71] As discussed in Section 3.15, Utilities, the SUMC Project would have a less-than-significant impact on natural gas and electrical facilities. This alternative involves the same amount of development as the SUMC Project, and would include the energy conservation measures that would apply to the new buildings under the SUMC Project. In addition, the Tree Preservation Alternative would not involve a greater amount of beds or employees than the SUMC Project. However, with this alternative, the demand on energy has the potential to increase from current conditions because of the increase in square footage and on-site activity. Like the SUMC Project, this increase would require the installation of additional feeder cables, which would occur within the same construction footprint as the SUMC Project. As discussed in Section 2, Project Description, the installation of the additional feeder cables is considered a part of the SUMC Project, and impacts associated with this construction activity are analyzed throughout this document. Therefore, like the SUMC Project, the Tree Preservation Alternative would result in less-than-significant impacts as a result of the installation and rerouting of electrical lines. (LTS)

Cumulative Demand for Utilities. As discussed in Section 3.15, Utilities, cumulative impacts related to solid waste facilities would be less than significant because the SMART Station and Kirby Canyon Landfill would have adequate capacity to serve their service area in 2025.[72, 73] Similarly, cumulative impacts related to water supply facilities are less than significant because the City plans to implement its WSCP in progressive stages, as needed to achieve a positive balance of supplies and demands. Therefore, the City can supply for its projected demands without exceeding SFPUC projected

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71 Stanford University Medical Center, Stanford University Medical Center Facilities Renewal and Replacement Project Application, August 2007, as amended; Tab 6, Table 6-1.

72 Debi Sargent, Solid Waste Contract Administrator, City of Sunnyvale, Public Works, electronic communication with PBS&J, November 10, 2008.

73 Guy Petraborg, Kirby Canyon Landfill, electronic communication with PBS&J, November 18, 2008.

allocations or the City's SFPUC ISG.[74] Likewise, the RWQCP has adequate capacity to serve its service area in 2025.[75]

Also, as discussed in the SUMC Project utilities analysis, the City's electricity, natural gas, and storm water drainage facilities have sufficient capacity to serve the cumulative development of the City in 2025. Future development in the City would generate an increased demand on utility facilities. This increase could require the maintenance and replacement of outdated and deteriorated wastewater facilities. The City has a Capital Improvement Program that provides replacements and maintenance for the City's utility facilities.[76] This program is funded by the rates charged by the City to customers for utility services. Any such replacements or maintenance under the Tree Preservation Alternative would comply with all applicable environmental regulations and would have a less than significant potential to contribute to a cumulative impact regarding utility facilities. (LTS)

Historic Preservation Alternative

Land Use

Conflicts with Applicable Land Use Designations and Zoning. Land use impacts associated with the Historic Preservation Alternative would be similar to those identified for the SUMC Project. Development proposed under this alternative would require a Comprehensive Plan Amendment and rezoning of the Main SUMC Sites to accommodate proposed development intensities, which would be adopted prior to any construction. Proposed buildout would not, therefore, conflict with applicable development regulations and zoning. (LTS)

Conflicts with Land Use Policies. With mitigation, no Comprehensive Plan policy conflicts were determined for the SUMC Project. Like the SUMC Project, this alternative would also require mitigation to ensure compliance with Comprehensive Plan policies that protect visual quality, pedestrian safety, historical resources, urban forest resources, groundwater and stormwater runoff, air quality, and noise incompatibility. The Historic Preservation Alternative would increase the number of hospital beds at the SUMC Sites at the same level proposed under the SUMC Project. Therefore, the Historic Preservation Alternative would address local and regional demand for medical services. This would be consistent with Policy L-7, which requires new development to address regional needs and overall City welfare and objectives.

In addition, Policies L-51, L-54, and L-58 encourage the preservation and adaptive reuse of historic structures. The Historic Preservation Alternative would preserve the 1959 Hospital Building complex and reuse it for clinic/medical office and research purposes. Also, as with the SUMC Project, this Alternative would renovate the Hoover Pavilion and would improve seismic operating conditions of

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[74] City of Palo Alto, Water Supply Assessment for Stanford University Medical Center Facilities Renewal and Replacement Project, August 2009.

[75] Rick Wetzel, Manager, Water Quality Control Plant in the Public Works Department, City of Palo Alto, electronic communication with PBS&J, November 26, 2007.

[76] City of Palo Alto, http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=3954, accessed November 24, 2008.

clinic uses within. Mitigation measures, which were not identified for the SUMC Project, are included in the below historic resource analysis to ensure that adaptive reuse of the 1959 Hospital Building complex would retain the historic integrity of this resource. As such, no conflict would occur with mitigation. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations
- TR-6.1: Bicycle and Pedestrian Infrastructure Improvements
- AQ-1.1: Implement Recommended Dust Control Measures
- AQ-1.2: Implement Diesel Emission Reduction Measures
- NO-1.1: Implement Best Management Practices to Reduce Construction Noise
- NO-4.1: Shield or Enclose HVAC Equipment and Emergency Generators
- BR-4.1: Prepare a Tree Preservation Report for all Trees to be Retained
- BR-4.2: Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks
- BR-4.3: Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention
- BR-4.4: Provide a Tree Preservation Bond/Security Guarantee
- BR-4.5: Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category
- CR-1.1: Manually Demolish Structures at the Hoover Pavilion Site
- CR-1.5: Implement Protection Documents for the Hoover Pavilion
- *Limit Most Proposed Alteration Work to the Interior of the Stone Building Complex* (New mitigation measure not identified for the SUMC Project; see Cultural Resources analysis for this alternative)
- *Retain Historic Windows* (New mitigation measure not identified for the SUMC Project; see Cultural Resources analysis for this alternative)
- *Retain Pasteur Drive Loop as Hardscape Around the Fountain* (New mitigation measure not identified for the SUMC Project; see Cultural Resources analysis for this alternative)
- *Maintain Consistency with the Secretary of the Interior's Standards* (New mitigation measure not identified for the SUMC Project; see Cultural Resources analysis for this alternative)
- *Design New Structures to be Consistent with Surroundings* (New mitigation measure not identified for the SUMC Project; see Cultural Resources analysis for this alternative)
- HW-3.1: Develop Workplan for any Unknown Contaminated Sites
- *No Net Increase in Runoff* (New mitigation measure not identified for the SUMC Project; see Hydrology analysis for this alternative)

Compatibility with Adjacent Land Use Character and Conflicts with Established Residential, Recreational, Educational, Religious, or Scientific Uses in the Area. Although development on the SUMC Sites would be more intense than under current conditions, the Historic Preservation Alternative would not introduce a new land use that would conflict with existing uses. No impact would occur, as for the SUMC Project. (NI)

Division of an Established Community and Farmland Conversion. The SUMC Project would have no impact on the division of an established community or farmland conversion. Similarly, the Historic

Preservation Alternative would not add physical barriers that might result in restriction of customary circulation patterns or a disruption of land use connectivity, nor would it require the acquisition and development of lands currently used for agricultural purposes. (NI)

Adverse Changes to Existing or Planned Land Use Pattern. Although amended land use designations and zoning would be required to implement the Historic Preservation Alternative, this alternative would maintain the existing overall land use pattern and type of the Project Vicinity. However, the Historic Preservation Alternative would involve an intensification of land uses by increasing building massing within the SUMC Sites. This intensification of land uses would be isolated to the SUMC Sites; however, the surrounding visual character and views from sensitive viewer locations could be impacted. Without implementation of the City's Architectural Review process to ensure appropriate alignment of proposed structures, this increase in massing would have a significant impact on the existing character and intensity, as with the SUMC Project. Implementation of Mitigation Measure VQ-2.1, as presented in the Visual Quality Section, would reduce the significant impacts on overall surroundings to a less-than-significant level. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Cumulative Impacts. This alternative, in combination with other reasonably foreseeable probable future development in the area, would have a less-than-significant cumulative impact on overall existing or planned land uses in the vicinity of the SUMC Sites. Any major development within the City, including this alternative and other adjacent projects, such as the construction of a three-story replacement medical office building at 777 Welch Road, would be subject to the City's Architectural Review process. Similarly, the SUMC Project would not contribute to a cumulative land use conflict. (LTS)

Visual Quality

Temporary Degradation of Visual Quality. The Historic Preservation Alternative would retain the 1959 Hospital Building complex, but would still construct new hospital facilities. Therefore, similar to the SUMC Project, there would be temporary but adverse visual impacts during the construction stage of the Historic Preservation Alternative, resulting in a significant visual impact. However, the following mitigation measure, as presented for the SUMC Project, would reduce phased construction impacts to less than significant. (S/LTS)

- VQ-1.1: Implement Construction Visual Improvement Plan

Permanent Degradation of Visual Character Post Construction. Similar to the SUMC Project, the Historic Preservation Alternative would increase on-site massing, reconfigure on-site layout, alter on-site landscaping and lighting, decrease open space, and incorporate new building materials and treatments. However, unlike the SUMC Project, the Historic Preservation Alternative would not construct a hospital module in Kaplan Lawn; therefore, the open space character of this area would be retained. Although the new SUMC Hospital building would alter existing visual conditions, this alternative would maintain the 1959 Hospital Building complex, its adjacent open spaces and plaza, and the general configuration of Pasteur Drive. In addition, although the height of the new SHC Hospital building may change the existing visual setting, the building height would not significantly alter the immediate existing setting of the 1959 Hospital Building complex due to open spaces and scale separations.[77] Nonetheless, as with the SUMC Project, visual impacts would be significant and development under this alternative would be required to adhere to the below mitigation measure requiring compliance with the City's Architectural Review process and recommendations. Therefore, with implementation of Mitigation Measure VQ-2.1, the Historic Preservation Alternative would not substantially degrade the existing visual character of the SUMC Sites or the surrounding area, resulting in a less-than-significant impact. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Alteration of Public Viewsheds, View Corridors, or Scenic Roads. In general, impacts of the Historic Preservation Alternative on views would be similar to the SUMC Project. Due to the increase in building mass, this alternative could have significant impacts on views if it were not addressed properly through the City's Architectural Review process. Mitigation Measure VQ-2.1 would mandate the Historic Preservation Alternative to undergo Architectural Review by the City and incorporate recommendations of the Architectural Review Board. Therefore, impacts to views under the Historic Preservation Alternative would be less than significant with mitigation. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Terrain Modification. Since the SUMC Sites are relatively flat, the Historic Preservation Alternative would have no impact on terrain modifications, as with the SUMC Project. (NI)

New Sources of Light and Glare. The Historic Preservation Alternative, similar to the SUMC Project, would create a new source of light and glare, resulting in a significant impact. However, development under this alternative would be required to adhere to Section 18.23.030 of the Municipal Code, which precludes significant glare and off-site spillage and would ensure that the design limited such conditions. In addition, the Historic Preservation Alternative would undergo Architectural Review by the City, as required by Mitigation Measure VQ-2.1. Therefore, light and glare impacts under the Historic Preservation Alternative would be reduced to less than significant. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Shadowing Public Open Spaces. New shadows would be cast under the Historic Preservation Alternative and the impacts are expected to be similar in scale to those of the SUMC Project since the increased floor area and building mass would be similar. However, the new shadows at the SUMC Sites would not be cast over public open spaces; therefore the Historic Preservation Alternative would result in a less-than-significant impact, similar to the SUMC Project. (LTS)

Cumulative Impacts. As discussed in Section 3.3, Visual Quality, cumulative impacts associated with visual character, sensitive views, light and glare, and shadowing would be less than significant. As this alternative would have the same intensity of development as the SUMC Project, cumulative impacts would also be less than significant. All projects in Palo Alto would be required to undergo Architectural Review by the City and adhere to Section 18.23.030 of the Municipal Code. (LTS)

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77 Architectural Resources Group, Inc., Stanford Medical Center Project: ARG Project Number 07030 Memo, March 12, 2010.

Transportation

Construction Impacts. During the demolition and construction phase, it is anticipated that traffic impacts would be primarily due to construction worker trips, the movement of heavy equipment that would be used for demolition and construction to and from the site, as well as material hauling. Although construction plans are not available, it is anticipated that the work would occur over several years, and be completed approximately at 2021 (although projected operations would not be realized until 2025). The total number of construction related trips would vary from year to year depending on the type and intensity of construction work being performed. Regardless, the arrival and departure times for construction workers would remain the same and would primarily occur during off-peak hours, typically arriving before 7:00 a.m. and leaving before 4:00 p.m. The movement of heavy construction equipment such as cranes, bulldozers, and dump trucks to and from the site would also be scheduled, where possible, to occur during off-peak hours. However, there is the potential for conflicts between construction related traffic and traffic on the surrounding roadway network. With implementation of the following mitigation measures, the significant construction related traffic impacts would be reduced to less-than-significant levels. (S/LTS)

- TR-1.1: Provide Off-Street Parking for Construction Related Vehicles
- TR-1.2: Maintain Pedestrian Access
- TR-1.3: Maintain Bicycle Access
- TR-1.4: Restrict Construction Hour
- TR-1.5: Restrict Construction Truck Routes
- TR-1.6: Protect Public Roadways During Construction
- TR-1.7: Maintain Public Transit Access and Routes
- TR-1.8: Prepare and Implement Construction Impact Mitigation Plan
- TR-1.9: Conduct Additional Measures During Special Events

Operational Impacts. Upon completion of the construction, there would be more hospital beds, medical facilities and clinics, staff, and parking spaces than under existing conditions. The proposed new and expanded hospital buildings under the Historic Preservation Alternative would be approximately the same as the SUMC Project. Overall employment, visitor and patient activity would be similar to the SUMC Project. As such, traffic impacts would be approximately the same as the SUMC Project. The impacts are summarized below.

Intersection LOS. Trip generation for the AM Peak Hour and the PM Peak Hour for the Historic Preservation Alternative would be the same as the SUMC Project: a net increase of 766 vehicle trips in the AM Peak Hour and 746 vehicle trips in the PM Peak Hour. These trips result in significant impacts at five intersections during the AM Peak Hour and 12 intersections during the PM Peak Hour.

The same intersection improvements listed for the 2025 Full Buildout scenario in Section 3.4, Transportation, would mitigate all of the significantly affected intersections under this alternative. However, several of these roadway capacity improvements are considered to be infeasible.

A more viable approach to mitigation involves the implementation of several more feasible measures, each of which would contribute to a partial reduction in the project's impacts. These measures include the installation of traffic adaptive signal technology in selected corridors, the construction of two additional bicycle and pedestrian undercrossings in Palo Alto and Menlo Park, the provision of an enhanced TDM program, and implementation of intersection improvements that are considered to be feasible. However, as with the SUMC Project, even with the implementation of these measures, there would still be a significant and unavoidable impact on intersection LOS under the Historic Preservation Alternative. Therefore, the Historic Preservation Alternative would have significant and unavoidable impacts on intersection LOS, like the SUMC Project. (S/SU)

- TR-2.1: Traffic Adaptive Signal Technology
- TR-2.2: Fund Additional Bicycle and Pedestrian Undercrossings
- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- TR-2.4: Fund or Implement those intersection Improvements that Have Been Determined to be Feasible
- TR-2.5: Coordinate with Other Jurisdictions for Potentially Feasible Roadway Improvements

Impacts on Roadway Segments. The Historic Preservation Alternative would contribute the same level of traffic to roadway segments as the SUMC Project. This would result in adverse traffic impacts to several roadway segments in the City of Menlo Park. Mitigation involves funding projects that would result in a shift in the mode of travel for SUMC employees, from automobile to walk, bike, bus, and train. These measures include providing additional bicycle and pedestrian undercrossings (Mitigation Measure TR-2.2), providing an enhanced TDM program (Mitigation Measure TR-2.3), and financial contributions to the City of Menlo Park's shuttle fee (Mitigation Measure TR-7.2).

However, even with implementation of these three measures, there would still be significant impacts on four Menlo Park roadways, including Marsh Road, Willow Road, Sand Hill Road, and Alpine Road. Therefore, just as with the SUMC Project, the traffic impacts to these roadway segments would remain significant and unavoidable with mitigation. (S/SU)

- TR-2.2: Fund Additional Bicycle and Pedestrian Undercrossings
- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- TR-7.2: Expand Public Transit Services

Local Circulation Impacts. The traffic projections for Welch Road for the Historic Preservation Alternative would be approximately the same as for the SUMC Project. The future volumes would approach the capacity of a two-lane roadway with a center turn lane. The high volume of traffic, combined with the numerous turning vehicles, pedestrian movements across and along Welch Road and bicycle travel along Welch Road would potentially create a safety hazard which is a significant impact.

Due to the shortness of the link, there is also the possibility that the queue to make the westbound left turn from Durand Way to Sand Hill Road would back up all the way to the intersection of Welch Road and Durand Way. This would also be a significant impact.

The safety hazard on Welch Road can be mitigated by requiring the SUMC Project sponsors to fund an independent traffic study to determine whether the private street connection between Roth Way and Pasteur Drive should be operated as a public street. The overflowing queue can be mitigated by requiring the project sponsors to pay for the development and implementation of a signing and striping plan for the Durand Way extension, and for the installation and optimization of the two signals at the intersections of Durand / Sand Hill and Durand / Welch. With implementation of these two measures, the potentially significant local circulation impacts would be reduced to less-than-significant levels. (S/LTS)

- TR-4.1: Fund Traffic Impact Study
- TR-4.2: Fund Signing and Striping Plan and Signal Optimization

Freeway LOS. The SUMC Project would not contribute sufficient traffic to US 101 or I-280 to exceed level of service standards. The Historic Preservation Alternative is not anticipated to generate any additional freeway trips than the SUMC Project, and therefore, would also have a less-than-significant impact on freeway LOS. (LTS)

Bicycle and Pedestrian Impacts. Bicycle and pedestrian traffic in and around the SUMC Sites is currently very extensive. Like the SUMC Project, this alternative would increase bicycle and pedestrian activity around the SUMC Sites due to increased employment and visitorship. Also, there would be increased intersection congestion due to this alternative. Both the increase in bicycle and pedestrian activity and project-generated traffic would result in an increase in hazards to pedestrian and bicyclists, which would be a significant impact under both the SUMC Project and this alternative. Mitigation involving bicycle and pedestrian intersection improvements would reduce the impact to less than significant. (S/LTS)

- TR-6.1: Bicycle and Pedestrian Infrastructure Improvements

Transit Impacts. Just as with the SUMC Project, the Historic Preservation Alternative would increase on-site employment, and this increase would in turn result in increased ridership on the routes serving the SUMC Sites. The resulting increase in ridership could exceed the capacity of the various transit services to and from the SUMC Sites. As such, the Historic Preservation Alternative could result in a significant impact on transit.

Furthermore, with implementation of the above mentioned Mitigation Measure TR-2.3 (enhancing the TDM program to include provision of Caltrain Go Passes to SUMC employees), it is expected that there would be a gradual mode shift, from commuting by automobile to commuting by public transit, by a significant percentage of hospital employees. This mode shift may take some amount of time to be realized, due to the fact that many people cannot immediately change their commuting habits. However, it is expected that the transit mode share for SUMC employees will gradually increase from the current 8.9 percent to approximately 21.1 percent, and the share of SUMC employees commuting by Caltrain would increase from 3.6 percent to approximately 16 percent. At this level of transit ridership, the level of auto use would be reduced to a level where many of the intersection impacts are reduced to less-than-significant levels.

However, the success of the TDM program would also mean increased transit ridership. This increased ridership could push load factors above 1.0, indicating overcrowding on the buses. Impacts to transit service in the study area are considered a significant impact according to City of Palo Alto criteria.

Therefore, with implementation of the following mitigation measures involving the modification of the SUMC Project's design to include the addition of two transit centers, and the expansion of public transit service, this alternative would have a less-than-significant transit impact, like the SUMC Project. (S/LTS)

- TR-7.1: Incorporate Transit Centers into Site Plans
- TR-7.2: Expand Public Transit Service

Parking Impacts. The number of parking spaces provided for the Historic Preservation Alternative would remain the same as under the SUMC Project. The Historic Preservation Alternative is also not anticipated to result in any additional demand for parking. The total demand would be 2,983 spaces, and a total of 2,985 spaces would be supplied. Therefore, this alternative would provide adequate on-site parking capacity, and would have a less-than-significant parking impact, as with the SUMC Project. (LTS)

Emergency Impacts. As indicated in Section 3.4, Transportation, as well as the Transportation Analysis, the SUMC Project would have a significant impact on emergency vehicle access due to its increased roadway congestion. Because the Historic Preservation Alternative would also increase roadway congestion at the same level, this alternative would also have significant impacts on emergency vehicle access. With implementation of the emergency access mitigation identified in Section 3.4, Transportation, this alternative's impact on emergency access would be reduced to a less than significant level. (S/LTS)

- TR-9.1: Pay Fair Share Towards OptiCom Installation

Cumulative Impacts. LOS impacts under the analysis above already account for cumulative growth through 2025 because this growth has been incorporated in the City of Palo Alto Travel Demand Forecasting Model, which is the basis for 2025 conditions. This growth is also accounted for in the above analysis of pedestrian,and emergency access impacts. Those analyses that incorporate cumulative growth in the City of Palo Alto Travel Demand Forecasting Model already capture a cumulative analysis, and no further cumulative discussions for those topics are provided here. Parking impacts are site-specific and do not cumulate with other projects. As such, the only transportation-related impacts to which a cumulative analysis applies are construction-period and transit impacts.

As with the SUMC Project, cumulative impacts on transit would be less than significant since transit agencies would necessarily adjust the distribution of transit vehicles to accommodate demand. However, there would be significant cumulative impacts during construction of both the SUMC Project and the Historic Preservation Alternative. Due to the intense construction required under the Historic Preservation Alternative, this alternative's contribution to the cumulative impact would be considerable, like the SUMC Project. Mitigation Measures TR-1.1 through TR-1.9, as identified above, would reduce the contribution to less than cumulatively considerable. (S/LTS)

Air Quality

Construction Criteria Air Pollutant Emissions. Because some of the existing on-site buildings would be preserved, this alternative would have reduced impacts compared to the SUMC Project during demolition and construction; however, the Historic Preservation Alternative still would generate substantial quantities of fugitive dust and exhaust emissions from demolition, grading, and building activities. This alternative would require the implementation of standard BAAQMD control measures for fugitive dust and diesel emissions just as the SUMC Project. Mitigation measures would reduce construction dust impacts to less-than-significant levels, but could remain significant and unavoidable for NO_x emissions. (S/SU)

- AQ-1.1: Implement Recommended Dust Control Measures
- AQ-1.2: Implement Diesel Emission Reduction Measures

Operational Criteria Air Pollutant Emissions. As discussed in Section 3.5, Air Quality, operational emissions of criteria pollutants PM_{10} associated with the SUMC Project would exceed BAAQMD thresholds. Thus, the SUMC Project's operational emissions were determined to be significant and unavoidable. The Historic Preservation Alternative would have slightly greater square footage; however, because this alternative would include the same uses as the proposed SUMC Project, this alternative would generate the same daily motor vehicle trips. Therefore, this alternative would also generate essentially the same criteria pollutant emissions, which would also exceed the BAAQMD thresholds. The Historic Preservation Alternative and the SUMC Project would have significant and unavoidable impacts regarding operational emissions of criteria pollutants, even with mitigation, outlined below. Also, like the SUMC Project, this alternative would have a less-than-significant impact on localized concentrations of CO. (S/SU)

- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- PH-3.1: Reduce the Impacts on the Jobs to Employed Residents Ratio

Construction and Operational TACs. The SUMC Project Health Risk Assessment evaluated TAC emissions from construction equipment and new operational sources (i.e., emergency diesel generators, delivery trucks, and additional medical helicopter flights/heliport) and found the associated health impacts to be less than significant. Under the Historic Preservation Alternative, construction-phase TAC emissions would be less than the SUMC Project because this alternative would use less diesel-powered construction equipment during demolition and construction than required for the SUMC Project. The layout for this alternative would concentrate the construction activities in a smaller area than the SUMC Project, and would thus concentrate the construction emissions farther from the receptor and reduce the receptor's exposure to construction-related TACs compared to the SUMC Project. The operational sources of TACs associated with the Historic Preservation Alternative (i.e., the emergency diesel generators, truck loading docks and heliport) would likely result in the same emissions than those evaluated in the SUMC Project Health Risk Assessment, since Historic Preservation Alternative would result in approximately the same floor area as the SUMC Project. In addition, the emergency diesel generators along Welch Road would be moved to a new location, which is closer to the center of the Main SUMC Site, and would be further away from off-site sensitive receptors. Thus, construction and operational TAC impacts would be less than significant. (LTS)

Cumulative Impacts. The SUMC Project's emissions of NO_x during construction and of TACs during construction and operation were identified as making cumulatively considerable contributions to significant cumulative impacts. Under the Historic Preservation Alternative**,** emissions of NO_x during construction would also potentially exceed the BAAQMD's 80 lbs/day threshold, and could contribute to significant cumulative impacts. The TACs emitted during construction, though likely posing a lesser heath risk than those of the SUMC Project, would also make a cumulatively considerable contribution to the high TAC background levels of the area in which the SUMC Sites are located. Consequently, this alternative's cumulative TAC impacts would be cumulatively significant. The same construction-period Mitigation Measure AQ-1.2, mentioned above, would help reduce TAC emission from this alternative, but not to a less than considerable level. Consequently, this alternative's construction NO_x emissions and cumulative TAC impacts would be cumulatively significant. (S/SU)

Climate Change

Consistency with the Climate Protection Plan. The Historic Preservation Alternative is assumed to include the Emissions Reduction Program proposed under the SUMC Project.

Construction Impacts. During construction of the Historic Preservation Alternative, greenhouse gases would be emitted predominately through the operation of construction equipment. Under this alternative, some of the anticipated new development under the SUMC Project would be relegated to renovations of existing historic buildings. Under this alternative a net increase in square footage of approximately 12,200 square feet is anticipated. Because the demolition of the historic buildings and therefore construction of some of the new buildings proposed under the SUMC Project will not occur, construction emissions are anticipated to less than those anticipated under the SUMC Project. Construction emissions are regulated on a basin-wide basis, rather than for individual projects. Thus, the construction greenhouse gas emissions projected for the Historic Preservation Alternative would not be considered significant provided it incorporated the BAAQMD recommended reduction measures, which would be required as mitigation.

Operational Impacts. The net increase in operational activities under the Historic Preservation Alternative would be identical to that of the SUMC Project with the only difference being number of buildings, building layout, and the lower energy efficiency of the older buildings preserved. The increase in 12,000 square feet of operating space and increased energy requirements of the older buildings being preserved is anticipated to result in a slight increase in greenhouse gas emissions from the proposed SUMC Project due to the energy requirements.

For the new and expanded hospital facilities, the Historic Preservation Alternative would include the Emissions Reduction Program for minimizing greenhouse gas emissions associated with new building construction and operation, similar to those proposed under the SUMC Project. The Emissions Reduction Program would minimize greenhouse gas emissions at the new facilities. However the preservation of the historic buildings and the lower energy efficiencies would result in similar and potentially more emissions than the SUMC Project.

AB 32, the CARB's Scoping Plan, incorporates a 30 percent reduction target from 2020 BAU emissions limits. The City's Climate Protection Plan's incorporates this BAU approach to quantify emissions from significant, new projects which were not included in the City's existing inventory. As such, this analysis applies the 2020 reduction goal (equivalent to 30 percent below BAU) as a target threshold for compliance with the City Climate Protection Plan. As it is anticipated that the Historic Preservation Alternative may result in increased emissions from and therefore less of a reduction than the approximately 6 percent anticipated with the proposed SUMC Project, The Historic Preservation Alternative must employ additional mitigation measures to further reduce emission impacts.

Mitigation applied to the SUMC Project would also apply to this alternative. Mitigation Measures CC-1.1 through CC-1.5, and TR-2.3, in Section 3.4, Transportation, would reduce the Historic Preservation Alternative's greenhouse gas emissions and would further the policies of the Climate Protection Plan. In addition, the City shall consider the feasibility of Mitigation Measure PH-3.1, as identified in Section 3.13, Population and Housing.

- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- CC-1.1: Commissioning and Retro-Commissioning of Energy Systems for New and Existing Buildings
- CC-1.2: Participation in Palo Alto Green Energy Program
- CC-1.3: Annual Greenhouse Gas Reporting
- CC-1.4: Preparation of a Waste Reduction Audit
- CC-1.5: BAAQMD Construction Emission Reduction Measures
- PH-3.1: Reduce the Impacts on the Jobs to Employed Residents Ratio

Notwithstanding all of these features which satisfy individual policies set forth in the Climate Change Plan, as with the SUMC Project, the Historic Preservation Alternative would still result in a significant overall increase in greenhouse gas emissions within the City, in contravention of the overall goals of the Climate Change Plan. As emissions from the Historic Preservation Alternative are anticipated to be similar to, if not increased from, the SUMC Project, the reductions afforded by the proposed mitigation would not reduce emissions to a level 30 percent below BAU. Therefore, emissions from the Historic Preservation Alternative would be significant and unavoidable. (S/SU)

Result in Significant Emissions of Greenhouse Gases. Even with the implementation of all feasible mitigation measures, it is anticipated that emissions reductions afforded the Historic Preservation Alternative would not achieve either the City of Palo Alto's Climate Protection Plan or the CARB's reduction emission goals of 30 percent below BAU emissions. Because these reduction levels cannot be achieved, the Historic Preservation Alternative would emit significant amounts of greenhouse gases and would have a cumulatively considerable contribution to global climate change (S/SU).

Noise

Construction Impacts. Under the Historic Preservation Alternative, the types of construction activities would be similar as the SUMC Project, although with less demolition. However, as with the SUMC Project, construction noise impacts under this alternative would still be significant for on-site receptors. However, Mitigation Measure NO-1.1 would not reduce construction noise to less than significant. (S/SU)

- NO-1.1: Implement Best Management Practices to Reduce Construction Noise

Operational Impacts. Operational noise from the Historic Preservation Alternative, associated with HVAC equipment and emergency generators, would be similar to that from the SUMC Project and would be mitigated to less-than-significant levels with implementation of Mitigation Measure NO-4.1, as presented for the SUMC Project. In addition, the Historic Preservation Alternative would locate the emergency generators along Welch Road closer to the center of the Main SUMC Site, and would be further away from off-site sensitive receptors. This alternative would not worsen noise impacts associated with motor vehicle traffic, truck loading activities, and medical helicopters using the new heliport, since the development program for the Historic Preservation Alternative would be the same as the SUMC Project. The Historic Preservation Alternative would include the same number of parking spaces as the SUMC Project, but instead of the underground parking structure at the Welch Road/Pasteur Drive intersection proposed under the SUMC Project, the Historic Preservation Alternative would construct a structure with three levels underground and four levels aboveground, along Welch Road. The inclusion of this aboveground parking garage could increase noise levels for residents across Welch Road, but the increased noise associated with this garage would not be significant. Relocation of the ED would be similar to the SUMC Project, and would add a major ambulance access route along Sand Hill Road with consequent significant unavoidable noise impacts to residential uses along Sand Hill Road between El Camino Real and Durand Way. (S/SU)

- NO-4.1: Shield or Enclose HVAC Equipment and Emergency Generators

Cumulative Impacts. Cumulative noise impacts would be similar under this alternative and the SUMC Project. As with the SUMC Project, there would be significant cumulative construction noise with this alternative, both on site and off site. Mitigation Measure NO-1.1 would be warranted but would not reduce the contribution if this alternative to less than considerable. This alternative would result in significant and unavoidable construction noise impacts. Also, there would be no significant cumulative vibration impacts with the SUMC Project as well as this alternative. No other foreseeable project would generate ambulance noise and so there would be no cumulative impacts from ambulance noise. (S/SU)

Cultural Resources

Impacts on the Stone Building Complex. Under this alternative, the Stone Building complex could be impacted by the proposed modifications to the building and its surroundings. The Architectural Resources Group, Inc. (ARG), analyzed the Historic Preservation Alternative to determine if this alternative would avoid or substantially lessen the impact of the SUMC Project on the historical Stone

Building complex. The ARG memorandum that includes this analysis is included as Appendix N of this document. [78] ARG's analysis primarily relates to the effect of the Historic Preservation Alternative on the eligibility of the Stone Building complex for listing in the CRHR. The Historic Preservation Alternative was evaluated in terms of its impact on the integrity of the historical resource, which must be retained for it to remain eligible for the CRHR, as well as the Historic Preservation Alternative's consistency with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings (Secretary of the Interior's Standards). The analysis is summarized below.

- *Integrity Analysis*. A property's integrity is typically recognized through seven aspects or qualities: location, design, setting, materials, workmanship, feeling, and association, as identified in the U.S. Department of the Interior, National Park Service *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*. ARG evaluated the Historic Preservation Alternative in terms of its impact on the integrity of the historic resource, which must be retained for it to remain eligible for the CRHR. Without mitigation, as provided below, the impacts to the exterior of the Stone Building complex, including the historic windows, would result in a significant impact.
- The Pasteur Drive configuration was an important part of the E.D. Stone's original Master Plan for the Stone Building complex. Under the Historic Preservation Alternative, some changes would be made to the road configuration: Blake-Wilbur Drive, SUMC Promenade, and loop road around the fountain would be closed to automobile traffic, and a new road would be constructed running north-south through Kaplan Lawn, thereby moving the drop-off loop to the west. The locations of Blake-Wilbur Drive and SUMC Promenade were indicated on Stone's Master Plan; however, their removal does not change the overall configuration of the loop road, open space or approach to the Stone Building complex. In Stone's Master Plan these roads were designed to extend to the north and south, creating a grid. The roads now end at Pasteur Drive and this element of the Master Plan is no longer evident. ARG found that the removal of these two roads would not significantly affect the setting of the Stone Building complex or Stone's Master Plan.
- ARG concluded that closing the drop-off loop around the fountain and moving it west would have a more significant impact on the Master Plan design than closing Blake-Wilbur Drive or the SUMC Promenade. The loop was one of the key features of the Master Plan; the relationship between the road configuration and the hospital integrated the building and landscape. If the roadbed were removed and replaced with landscaping, the original circulation design and relationship between the Stone Building complex and Pasteur Drive would be obscured. However, ARG found that if the roadway was closed to automobiles as proposed, but the roadway configuration was retained, this element of the Master Plan would still be communicated. As such, with the incorporation of the below mitigation measures, the significant alterations to the drop-off loop would result in a less-than-significant impact.

[78] Architectural Resources Group, Inc., Stanford Medical Center Project: ARG Project Number 07030, Memo to PBS&J, March 17, 2010.

- *Consistency with the Secretary of the Interior's Standards.* CEQA Guidelines Section 15064.5, Determining the Significance of Impacts to Archeological and Historical Resources, (b) (3) states that, "generally, a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings shall be considered as mitigated to a level of less-than-significant impact on the historical resource." ARG analyzed the Historic Preservation Alternative for its conformance with the Secretary of the Interior's Standards (see Appendix N). ARG concluded that the Historic Preservation Alternative would be consistent with the Secretary of the Interior's Standards if certain conditions, as outlined below as mitigation measures, are met.

The below mitigation measures are specific to the Historic Preservation Alternative and would not apply to the proposed SUMC Project. ARG concluded that under the Historic Preservation Alternative, the seven aspects of integrity would be retained if the below mitigation measures were met, resulting in a less-than-significant impact. Also, the Historic Preservation Alternative would maintain the integrity of the Stone Building complex and would be consistent with the Secretary of the Interior's Standards if these mitigation measures are met. (S/LTS)

- *Limit Most Proposed Alteration Work to the Interior of the Stone Building Complex.* The impact of the proposed structural, mechanical, and life safety improvements to the Stone Building complex shall be reduced by pursuing an alternative where alterations are carried out at the building interior and designed to comply with the Secretary of the Interior's Standards.

- *Retain Historic Windows.* The existing double-hung windows shall be retained and fixed in a closed position. In addition, any necessary seals or other additional hardware at the interior face shall be installed. If alterations are carried out at the building exterior or the installation of new windows are proposed, the changes shall be reviewed for compliance with the Secretary of the Interior's Standards.

- *Retain Pasteur Drive Loop as Hardscape Around the Fountain.* If it is not feasible for the asphalt and concrete curbs to be preserved, new materials of the roadbed shall be differentiated from the surrounding paving that historically functioned as sidewalks or plaza. This shall be accomplished by using hardscaping that is distinct from the surrounding sidewalks in color or material. Installing street furniture or planting in the roadway shall be avoided in order to maintain the circulation pattern.

- *Maintain Consistency with the Secretary of the Interior's Standards.* The Stone Building Complex shall be rehabilitated according to *The Secretary of the Interior's Standards for Rehabilitation*. Stanford University shall retain a qualified historic preservation professional meeting the *Secretary of the Interior's Professional Qualification Standards* for Historic Architecture to guide and review the rehabilitation work for consistency with *The Standards* during the design and construction phases. The City of Palo Alto would peer review the work of the historic preservation professorial prior to issuing any permits.

- *Design New Structures to be Consistent with Surroundings*. The proposed SHC Hospital building shall utilize design features that break-up the mass and elevations of the tall pavilions. The design of the SHC Hospital building shall relate to the surrounding existing buildings, including the Stone Building complex.

Impacts on the Hoover Pavilion. Under the Historic Preservation Alternative, as with the SUMC Project, Hoover Pavilion would be renovated, a structured parking garage would be constructed, and the Hoover Medical Office Building would be built at the Hoover Pavilion Site. Identical to the SUMC Project, the new construction would require the demolition of existing structures. Although vibrations have the potential to cause damage to the Hoover Pavilion, the vibration would be below the vibration threshold level at 25 feet away. However, similar to the SUMC Project, demolition of the small sheds and storage facilities approximately 20 feet from the historic Hoover Pavilion could cause significant damage. The following mitigation measures, also proposed for the SUMC Project, would prohibit the use of equipment that could create potentially damaging vibration levels, reducing this impact to less than significant. (S/LTS)

- CR-1.1: Manually Demolish Structures at the Hoover Pavilion Site
- CR-1.5: Implement Protection Documents for the Hoover Pavilion

Impacts on Archaeological Resources and Human Remains. Prehistoric cultural resources and human remains have not been encountered within the site of the Historic Preservation Alternative. As with the SUMC Project, it is possible, although unlikely, that archaeological resources and human remains could be encountered during the Historic Preservation Alternative ground-disturbing activities. The following mitigation measures, as presented for the SUMC Project, would ensure that the impact remains less than significant. (S/LTS)

- CR-2.1: Construction Staff Training and Consultation
- CR-3.1: Conduct Protocol and Procedures for Encountering Human Remains

Impacts on Paleontological Resources. There have been significant paleontological finds in the immediate vicinity of the SUMC Sites. As with the SUMC Project, disturbance of any paleontological resources is a significant impact; however, the following mitigation measure, which is identified for the SUMC Project, would reduce the impact to less than significant. (S/LTS)

- CR-4.1: Conduct Protocol and Procedures for Encountering Paleontological Resources

Cumulative Impacts. Cumulative impacts on archaeological and paleontological resources and human remains from this alternative and adjacent development could be significant due to potential presence of these resources in the area. As with the SUMC Project, this analysis conservatively finds that this alternative would have a cumulatively considerable contribution to the cumulative impact. Mitigation Measures described above would ensure that this alternative's contribution would be less than cumulatively considerable.

The cumulative context for historical resources includes past, current and reasonably foreseeable probable future projects that affect historic properties/resources within the City, especially any that could affect similar resources such as other E.D. Stone-designed buildings. As described in Section

3.1, a list of projects was provided by the City for this analysis (Appendix B), three of which could result in potential impacts on historical resources; this same context is used to evaluate the alternatives. Two of the three projects on the list in Appendix B are noted as preserving and rehabilitating historic resources while the third is described as a major rehabilitation, and it is unclear the extent of the major rehabilitation. If the rehabilitation was done to the Secretary of the Interior's Standards it would constitute a less-than-significant impact under CEQA. In all three cases, it appears that the historic buildings were retained to varying degrees. Implementation of Mitigation Measures CR- 1.1, CR-1.5, CR-2.1, CR-3.1, CR-4.1, and the new mitigation measures regarding ARG recommendations would lessen the Historic Preservation Alternative's contribution to a level of less than cumulatively considerable. (S/LTS)

Biological Resources

Special Status Plant or Wildlife Resources. Habitat on-site capable of supporting special-status plants or wildlife is limited to roosting habitat for special-status bats and Cooper's hawk. Buildings in the SUMC area could provide roosting habitat for special-status bat species known from the region, and trees in the SUMC area could provide nesting habitat for Cooper's hawk. Removal of trees containing Cooper's hawk nests, or removal of, or modification to, buildings containing active bat roosts could result in the loss of individual Cooper's hawk, bats, bat colonies, or their habitat. Although the 1959 Hospital Building complex would remain, and the historic integrity of Pasteur Drive and its landscaping would be preserved under the Historic Preservation Alternative, other structures at the Main SUMC Site and structures at the Hoover Pavilion Site would be removed; therefore, as with the SUMC Project, implementation of the Historic Preservation Alternative could have a significant impact on Cooper's hawk and protected bat species. The following mitigation measure, as presented in Section 3.9, Biological Resources, would reduce the Historic Preservation Alternative's impact on Cooper's hawk and special-status bats to a less-than-significant level. (S/LTS)

- BR-1.1: Conduct Pre-Demolition Survey
- BR-1.2: Avoid Roosting Areas
- BR-1.3: Develop and Employ Bat Nest Box Plan
- BR-1.4: Avoid Tree Removal During Nesting Season
- BR-1.5: Protect Cooper's Hawk in the Event of Nest Discovery

Loss of Riparian or Other Sensitive Habitats. Similar to the SUMC Project, the Historic Preservation Alternative would have no impact on riparian habitats. While the 1959 Hospital Building complex would not be demolished, and the historic integrity of Pasteur Drive and its landscaping would be preserved, construction of new buildings would still be required at the Main SUMC Site, thus resulting in an increase in impervious area. However, due to the distance from the creek, it is unlikely that surface runoff or sedimentation from construction under the Historic Preservation Alternative could reach the creek in a substantial enough quantity to affect riparian vegetation, or cause significant fill of the channel within San Francisquito Creek. Additionally, mitigation measures and BMPs detailed in Section 3.11, Hydrology, would further reduce the potential for loss of riparian or wetland habitats due to sedimentation and erosion. Therefore, the impact of the Historic Preservation Alternative on the riparian habitat of San Francisquito Creek would be less than significant. (LTS)

Interference with Species Movement, Wildlife Corridors, or Nursery Sites. Similar to the SUMC Project, the Perseveration Alternative would require the removal of on-site trees, and modifications to existing structures, which could be used by migratory birds as nursery sites, including birds that nest on buildings (i.e., swallows, phoebes, etc.). Slightly fewer trees would be removed as compared to the SUMC Project since the 1959 Hospital Building complex would not be demolished and replaced with new buildings. Nonetheless, the Historic Preservation Alternative would result in a significant impact to migratory bird nests. The following mitigation measures, as recommended for the SUMC Project, would reduce the impact to less than significant. (S/LTS)

- BR-3.1: Avoid Tree Removals or Building Demolition During Nesting Season
- BR-3.2: Protect Birds in the Event of Nest Discovery

Impacts on Protected Trees. The Historic Preservation Alternative would result in the removal of several trees, although to a lesser extent than the SUMC Project. As discussed in Section 3.9, Biological Resources, the SUMC Project would result in the removal of up to 71 Protected Trees, 23 of which are considered to be biologically and aesthetically significant. Although the Historic Preservation Alternative would attempt to protect these biologically and aesthetically significant Protected Trees, this alternative would still result in the removal of several Protected Trees at the SUMC Sites that do not fall under this distinction. Therefore, the Historic Preservation Alternative would still result in a significant impact to Protected Trees.

However, unlike the SUMC Project, the Historic Preservation Alternative would retain or relocate all of the designated biologically and aesthetically significant Protected Trees. There are nine of these Protected Trees located in Kaplan Lawn, and since a hospital module six would not be constructed under this alternative in the Kaplan Lawn, all Protected Trees in Kaplan Lawn would be retained. In addition, since the 1959 Hospital Building complex would remain, the FIM 1 building would not be constructed in the FIM 1 grove. As such, all 12 biologically and aesthetically significant Protected Trees in the FIM 1 grove would be retained in place. Additionally, the two biologically and aesthetically significant Protected Trees adjacent to Welch Road would either be retained or relocated. Therefore, the Historic Preservation Alternative would have a less-than-significant impact to the Protected Trees that fall under the biologically and aesthetically significant designation.

Nonetheless, the Historic Preservation Alternative would still result in the removal of several Protected Trees around the new SHC Hospital Building, the LPCH Hospital building, and at the Hoover Pavilion Site. The following mitigation measures, as identified for the SUMC Project, would reduce the Historic Preservation Alternative's impact on Protected Trees to be retained and relocated to a less-than-significant impact. However, these measures would not be able to avoid the removal of several Protected Trees at the SUMC Sites and therefore, even with the implementation of the below mitigation measures, the Historic Preservation Alternative would result in a significant and unavoidable impact. (S/SU)

- BR-4.1: Prepare a Tree Preservation Report for all Trees to be Retained
- BR-4.2: Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks

- BR-4.3: Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention
- BR-4.4: Provide a Tree Preservation Bond/Security Guarantee
- BR-4.5: Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category

Conflicts with an HCP or NCCP. The Santa Clara Valley HCP is the nearest adopted HCP/NCCP in the region, but the SUMC Sites are not included within its boundaries. The Stanford University HCP is currently in public review and has not been adopted. As such, similar to the SUMC Project, the Historic Preservation Alternative would have no impact on an applicable HCP or natural communities conservation plan. (NI)

Cumulative Impacts. Cumulative development of past, current, and reasonably foreseeable probable future development, could negatively impact special-status bats, Cooper's hawk, and migratory birds, thus resulting in a significant cumulative impact on these resources. However, the size of disturbance under the Historic Preservation Alternative is smaller than under the SUMC Project. This alternative's contribution to regional loss of urban habitat would be less than with the SUMC Project Therefore, as with the SUMC Project, implementation of Mitigation Measures BR-1.1 to BR-1.3 for special-status bats, and Mitigation Measures BR-1.4 and BR-1.5 for Cooper's hawk, the Historic Preservation Alternative's contribution to the regional loss of urban habitat for special-status bats and Cooper's hawk is less than cumulatively considerable. Similar to the SUMC Project, even with implementation of mitigation measures discussed above, the contribution of the Historic Preservation Alternative to the cumulative loss of protected trees would be cumulatively considerable. (S/SU)

Geology, Soils, and Seismicity

Exposure to Seismic-Related Hazards. The Historic Preservation Alternative would have approximately the same no-impact or less-than-significant potential as the SUMC Project to expose people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground-shaking, seismic-related ground failure (including liquefaction), landslides, or expansive soil.

Similar to the SUMC Project, the Historic Preservation Alternative would include the construction of new hospital buildings, clinical/medical offices, and above- and below-ground parking structures (not all in the same locations as the SUMC Project). Consequently, the hospital portion of the Historic Preservation Alternative would be required to meet the heightened safety standards of OSHPD 1, including the seismic requirements of HFSSA as amended by Senate Bill (SB) 1953. Implementation of these standards and criteria would minimize the risk of loss, injury, or death from seismic events through the requirement that the hospital building remain standing and be operational following a major earthquake. The design of the non-hospital portion of the Historic Preservation Alternative, including the 1959 Hospital Building complex, would be required to meet the standards contained in the then-current CBC. Because the newly constructed and retrofitted buildings under the Historic Preservation Alternative would be required to conform to current applicable OSHPD or City Building Code standards, they would not create any significant seismic hazards, soil instability hazards, or other hazardous geotechnical conditions.

Because the 1959 Hospital Building complex could not be used as hospital buildings, as defined by OSHPD, any seismic structural upgrades would be in accordance with OSPHD 3 or the City of Palo Alto requirements, dependant on the re-use of the building. The upgrades could include some form of exterior lateral restraint system, lengthening of shear walls, adding interior brace frames, thickening existing interior walls, and/or adding beams or beam "collectors" to transfer static and seismic loads from the walls to the foundation. With oversight responsibility vested in the City, there would be a very low probability that any design feature approved by that agency would have other than a less-than-significant potential to expose people or property to ground-shaking, seismic-related ground failure (including liquefaction), landslides, or expansive soils hazards.

The City would enforce the applicable OSPHD 3 or City Building Code requirements at the portions of the 1959 Hospital Building complex to be preserved, providing protection from strong seismic ground-shaking, seismic-induced ground failure (including liquefaction), landslides, and expansive soils. The hospital portion of the Historic Preservation Alternative would be required to meet the strict safety standards established by OSHPD, including the seismic standards mandated in the HFSSA. With oversight responsibility vested in OSHPD FDD for the hospital buildings and in the City for the non-hospital buildings, there would be a very low probability that any design feature approved by either agency would have other than a less-than-significant potential to expose people or property to major geologic hazards. (LTS)

Exposure to Other Geotechnical Hazards. The Historic Preservation Alternative would have approximately the same less-than-significant potential as the SUMC Project to be located on a geologic units or on soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.

The regulatory environment providing protection from ground failures such as landslide (trench wall instability), lateral spreading (trench wall instability), subsidence, liquefaction, or collapse would be enforced by the City for the non-hospital buildings and by OSHPD FDD for hospital buildings. With oversight responsibility vested in OSHPD FDD for the hospital buildings and in the City for the non-hospital buildings, there would be a very low probability that any design feature approved by either agency would have other than a less-than-significant potential to expose people or property to on- or off-site landslide, lateral spreading, subsidence, liquefaction, or soil collapse. (LTS)

Cause Substantial Erosion or Siltation. The Historic Preservation Alternative would have approximately the same less-than-significant potential as the SUMC Project to cause substantial erosion or siltation.

The additional trenching to separate utility lines for the 1959 Hospital Building complex from any hospital buildings and the excavation for the relocated underground parking structure would occur in the same regulatory environment as that of the clinic/medical office buildings proposed under the SUMC Project. With oversight responsibility vested in OSHPD FDD for the hospital buildings and in the City for the non-hospital buildings, there would be a very low probability that any design feature approved by either agency would have other than a less-than-significant potential to expose people, property, or downstream water courses to erosion and siltation hazards. (LTS)

Cumulative Impacts. Soil and geologic conditions are site-specific and there is little, if any, cumulative relationship between the SUMC Sites and other areas in the City. As such, the potential for cumulative impacts to occur is geographically limited for many geology and soils impact analyses. The Historic Preservation Alternative would have approximately the same less-than-significant potential as the SUMC Project to cause cumulatively substantial erosion or siltation. Construction and operational activities embodied in the Historic Preservation Alternative would be subject to the same regulation as the SUMC Project. Consequently, this alternative would not contribute to cumulative effects related to geology, soils, or seismicity. (LTS)

Hydrology

Flood Risks and Flood Flows. The SUMC Sites are not in a 100-year flood hazard area and therefore, as with the SUMC Project, there would be no impact from the Historic Preservation Alternative regarding flood hazards and flood flows. (NI)

Groundwater Recharge and Local Water Table. As with the SUMC Project, no new groundwater supply wells would be implemented under the Historic Preservation Alternative. The new Welch Road/Pasteur Drive parking structure would be underground and portions of other structures may be partially underground. Therefore, temporary groundwater dewatering may be required during construction. As with the SUMC Project, the Historic Preservation Alternative impact on direct lowering of the water table level would be less than significant.

Since detailed final site plans of the Historic Preservation Alternative are not fully developed, unlike the SUMC Project, the Historic Preservation Alternative could potentially increase the overall site impervious surfaces, thereby reducing the potential for long-term groundwater recharge. As explained in Section 3.11, Hydrology, the SUMC Sites are not in a significant groundwater recharge area and a confining layer separates the surface water table groundwater from the deep groundwater aquifer in the vicinity. Consequently, although the Historic Preservation Alternative could reduce the potential for groundwater recharge compared to the existing conditions, and possibly compared to the SUMC project, the potential would be a less-than-significant operational impact on groundwater recharge. (LTS)

Groundwater Quality. As for the SUMC Project, the Historic Preservation Alternative construction activities could alter pollutant plume hydrology and plume movement at the Hoover Pavilion Site. As with the SUMC Project, existing regulations would prevent the introduction of construction pollutants into infiltrating water during construction and impacts on pollutant plume hydrology would be less than significant.

However, similar to the SUMC Project, the Historic Preservation Alternative exposure of potentially unknown contaminated soil to rainfall runoff or runon during construction could allow for infiltrating water to pick up pollutants and carry them to underlying groundwater. The following mitigation measure, as identified for the SUMC Project, would reduce the Historic Preservation Alternative's impact on groundwater quality to a less-than-significant level. (S/LTS)

- HW-3.1: Develop Workplan for any Unknown Contaminated Sites

Stormwater Runoff and Erosion and Streambank Instability. As with the SUMC Project, compliance with existing regulations would prevent substantial on-site erosion and off-site sediment transport from implementation of the Historic Preservation Alternative. Therefore, similar to the SUMC Project, Historic Preservation Alternative impacts on on-site erosion and off-site sediment transport would be less than significant.

As explained in Section 3.11, Hydrology, the Santa Clara Municipal Regional Permit HM Standard set limitations on increases in peak stormwater runoff rate and volume in areas where increased impervious surfaces could contribute to stream bed or bank erosion. HM controls include such site design techniques as reducing impervious surface area, promoting infiltration and evapotranspiration, and introducing alternative site design. The SUMC Project would reduce the amount of total impervious surfaces (pervious land surface plus green roofs); however, as explained above, the Historic Preservation Alternative could have more impervious surfaces than the SUMC Project, and therefore, higher stormwater runoff rates. However, even if the Historic Preservation Alternative increased the amount of impervious surfaces above existing conditions, it would not be required to implement HM controls to prevent off-site erosion in San Francisquito Creek because it is in an area exempt from requiring HM controls. Consequently, because San Francisquito Creek is listed as sediment impaired, impacts associated with increased runoff on off-site erosion could be significant, which is a new significant impact of the Historic Preservation Alternative.

If the Historic Preservation Alternative is found to have more impervious surfaces than the SUMC Project, then the following mitigation measure would apply. This mitigation measure, which is not identified for the SUMC Project, would reduce the potential Historic Preservation Alternative impacts on off-site erosion to less-than-significant levels. (S/LTS)

- *No Net Increase in Runoff.* Prior to receiving a grading or building permit, the SUMC Project sponsors shall develop and implement a Final Site Plan that does not increase the amount of post construction stormwater runoff from the SUMC Site.

Flooding and Stormwater Conveyance Capacity. As mentioned above, unlike the SUMC Project, the Historic Preservation Alternative could increase the amount of impervious surfaces that could contribute more stormwater runoff to the storm drain system and San Francisquito Creek. However, the Historic Preservation Alternative effect on flood event stormwater runoff would not be substantially different than the SUMC Project, which would be less than significant. Consequently, this would not substantially alter flood flows or stormwater conveyance capacities and the Historic Preservation Alternative impact on flooding and stormwater conveyance would be less than significant. (LTS)

Degradation of Surface Water Quality. Like the SUMC Project, existing regulations would prevent substantial transport of pollutants in stormwater runoff or to the sewer system by the Historic Preservation Alternative. However, unlike the SUMC Project, the Historic Preservation Alternative may not replace more than 50 percent of the SUMC Sites' impervious surfaces and therefore, the Historic Preservation Alternative would not be required to implement post-construction stormwater quality BMPs to treat the entire SUMC Sites' runoff. As such, there is a higher potential for pollutants in stormwater runoff to degrade surface water quality from implementation of the Historic Preservation Alternative, compared to the SUMC Project. Stormwater BMPs would still be required for all redeveloped areas, resulting in less potential for pollutants in stormwater runoff compared to existing conditions. Existing regulatory requirements would ensure that the Historic Preservation Alternative impacts on degradation of surface water quality would remain less than significant. (LTS)

Dam Failure Inundation. The Historic Preservation Alternative would increase the exposure of people to dam failure inundation compared to existing conditions, but would not increase the number of people exposed to risk compared to the SUMC Project. Therefore, impacts associated with dam failure inundation would be less than significant. (LTS)

Violation of Any Water Quality Standards or Waste Discharge Requirements (WDRs). The Historic Preservation Alternative WDRs and water quality standards would be the same as for the SUMC Project. Similar to SUMC Project, existing City regulations, permitting process, and construction inspection ensures that WDRs and water quality standards would not be violated. Consequently, as with the SUMC Project, the Historic Preservation Alternative impacts regarding violation of water quality standards or WDRs would be less than significant. (LTS)

Cumulative Impacts. As discussed in Section 3.11, Hydrology, cumulative impacts associated with current and future growth and development within the San Francisquito Creek watershed, surface runoff and erosion, flooding and stormwater conveyance capacity, streambank instability, degradation of surface water and groundwater quality, dam inundation, and violation of water quality standards and WDRs would be less than significant. Cumulative impacts within the Santa Clara Valley Groundwater Subbasin, on groundwater recharge, and on the local water table would be less than significant with existing regulations and management. (LTS)

Hazardous Materials

Exposure to Hazardous Materials During Construction. Construction, demolition, and renovation associated with the Historic Preservation Alternative could expose construction workers and the community to potential toxic contaminants associated with building materials, such as ACM. Additionally, building components containing PCBs, lead, and/or mercury could also be found in the buildings proposed to be demolished under this alternative. Exposure to these materials during construction, demolition, and renovation activities is considered a potentially significant impact, similar to the SUMC Project. However, adherence to all applicable health and safety requirements for these substances, along with the following mitigation measures as proposed for the SUMC Project, would ensure that potential exposure impacts are less than significant, similar to the SUMC Project. (S/LTS)

- HM-2.1: Conduct Asbestos Survey at the SUMC Sites

This alternative would renovate, rather than demolish and replace, the 1959 Hospital Building complex. All other earthwork proposed for the SUMC Project would apply to this alternative, including all construction activities at the Hoover Pavilion Site. As such, impacts related to exposure of workers and the public to contaminated soils and/or groundwater would be similar to those analyzed under the SUMC Project. The following mitigation measures, which are presented for the SUMC Project, would apply to the Historic Preservation Alternative and would reduce the significant construction impacts to a level of less than significant. (S/LTS)

- HM-3.1: Perform a Phase II ESA for the 701 Welch Site
- HM-3.2: Excavate Contaminated Soil from the 703 Welch Site
- HM-3.3: Conduct a Soil Vapor Program at the Hoover Pavilion Site
- HM-3.4: Develop a Site Management Plan for the Hoover Pavilion Site

Exposure to Hazardous Materials During Operation. Similar to the SUMC Project, operations under the Historic Preservation Alternative would include hazardous materials (such as flammable gas, oxidizers, and corrosive materials) and biohazardous materials (such as microorganisms, bacteria, and viruses). All uses, handling, and disposal of hazardous materials are highly regulated under existing federal, State, and local regulations. As such, compliance with all regulations would ensure that impacts associated with exposure to hazardous materials during operation activities under the Historic Preservation Alternative remain less than significant, as with the SUMC Project. (LTS)

Safety Hazards to Schools. In general, the Historic Preservation Alternative would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school; however, the LPCH includes an on-site school within the facility. The Historic Preservation Alternative would demolish and construct new buildings, and as such, could have the potential of increasing the amount of hazardous materials used on-site. Similarly to the SUMC Project, the Historic Preservation Alternative would be subject to regulation and operation practices that minimize hazard risks and would ensure that associated risks are not substantially increased. Consequently, impacts associated with hazardous materials exposure within one-quarter mile of an existing or proposed school, including the on-site school locate within the LPCH facility, would be less than significant. (LTS)

Wildfire Risk. As with the SUMC Project, this alternative would involve construction in a flat, urbanized area and therefore not in an area susceptible to significant grass, brush, or tree fires. As such, the Historic Preservation Alternative would not have an impact with regard to wildfire risk. No impacts would occur. (NI)

Safety Hazard from Public Airports. The Historic Preservation Alternative would not be located within the jurisdiction of any ALUP or within 2 miles of a public airport. Therefore, the Historic Preservation Alternative would not result in an airport safety hazard. No impacts would occur. (NI)

Emergency Response or Evacuation Plans. The demolition and construction phase of the Historic Preservation Alternative would involve construction worker trips and the movement of construction trucks and heavy equipment, as under the SUMC Project. The Historic Preservation Alternative would use the same construction truck routes as the SUMC Project, many of which are identified as primary evacuation routes in the EOP and the Comprehensive Plan. As such, construction traffic would interfere within emergency access along these routes, resulting in a significant impact. In addition, as with the SUMC Project, the Historic Preservation Alternative would upgrade utility infrastructure; therefore, road closures would occur under this alternative. The Historic Preservation Alternative would also increase operational on-site activity compared to existing conditions, resulting in an increase in vehicular travel within the City. Several intersections that would be impacted by the Historic Preservation Alternative are designated as primary emergency evacuation and response routes. Similar to the SUMC Project, due to additional traffic congestion at these intersections, travel time by emergency vehicles would increase, resulting in a significant impact. The below mitigation measures, as outlined for the SUMC Project, would reduce the impacts to emergency response and evacuation plans during construction and operation to less than significant. (S/LTS)

- HM-10.1: Coordinate Construction Activities with the City of Palo Alto
- TR-1.1: Provide Off-Street Parking for Construction Related Vehicles
- TR-1.4: Restrict Construction Hours
- TR-1.5: Restrict Construction Truck Routes
- TR-1.6: Protect Public Roadways During Construction
- TR-1.8: Prepare and Implement Construction Impact Mitigation Plan
- TR-9.1: Pay Fair Share Towards OptiCom Installation

Cumulative Impacts. As discussed in Section 3.12, Hazardous Materials, cumulative development would increase the use, storage, and handling of hazardous materials within the SUMC Sites and adjacent areas and also could increase risk of exposure at schools within a quarter mile of the SUMC Sites. However, these activities would be subject to laws and regulations pertaining to the handling, storage, and disposal of hazardous materials as described in Section 3.12. As such, cumulative impacts related to hazardous materials use, storage, and handling would be less than significant under both this alternative and the SUMC Project. With both the SUMC Project and this alternative, there would be no cumulative impacts related to construction of schools on contaminated property, hazards from wildland fires, or airport operations.

During demolition and excavation activities, this alternative could expose workers to contaminants associated with building materials, such as asbestos, and could also disturb contaminated soils on site. The 777 Welch Road project, almost adjacent to the Main SUMC Site, would also potentially release contaminants associated with building materials, and potentially disturb previously contaminated soils, which are known to occur in the areas adjacent to the SUMC Sites. That project and this alternative could result in significant cumulative impacts. The contribution of the Historic Preservation Alternative would be considerable given the extent of construction involved. Mitigation Measure HM-2.1 would involve measures to reduce exposure of persons to hazardous materials (such as asbestos). Mitigation Measures HM-3.1 through and HM-3.4, would involve investigations at other SUMC areas, remediation, and preparation of the Site Management Plan for remediation activities. These mitigation measures would reduce the Historic Preservation Alternative's contribution to a less than cumulatively considerable level.

Construction of reasonably foreseeable projects within the City could involve increased intersection delays, resulting in significant cumulative construction-period impacts on emergency access. The

Historic Preservation Alternative's contribution to the cumulative impact on emergency response and evacuation plans would be cumulatively considerable. However, Mitigation Measures HM-10.1, TR-1.1, TR-1.4 through TR-1.6, and TR-1.8, would reduce the Historic Preservation Alternative's contribution to cumulative impacts on emergency evacuation and response plans to less than cumulatively considerable. (S/LTS)

Population and Housing

Population Increases. The Historic Preservation Alternative would result in slightly more floor area than the SUMC Project. Since this increase is not significant, it is assumed that the net increase in direct employment and visitorship, and the indirect demand for housing, would be approximately the same as under the SUMC Project. Direct and indirect population increases would represent a small portion of the population projected by ABAG within the City of Palo Alto's sphere of influence and would therefore be less than significant. (LTS)

Displacement of Housing. Similar to the SUMC Project, this alternative would have no impact on the displacement of existing housing as no housing exists on the SUMC Sites. (NI)

Jobs to Employed Residents Ratio. As discussed in Section 3.13, Population and Housing, the jobs to employed residents ratio impact is not, by itself, considered an environmental impact; however, it is analyzed because this impact would result in secondary environmental impacts on air quality and climate change. Specifically, as with the SUMC Project, the Historic Preservation Alternative's impact on the jobs to employed residents ratio would result in increased commute traffic, which is a significant contributor to this alternative's significant and unavoidable impacts on air quality and climate change. As such, the analysis below identifies additional mitigation measures relating to the jobs to employed residents ratio, with additional measures the City can consider as a means for further mitigating those significant environmental impacts identified for air quality and climate change.

As shown in Table 3.13-6 in Section 3.13, Population and Housing, which would also apply to the Historic Preservation Alternative, 12,297 individuals would be employed at the SUMC, for a net increase of 2,417 employees. Adjusted for part time employment, the net increase under the Historic Preservation Alternative would result in 2,242 employees. This increase would result in total net added employee households of 1,303 household (Table 3.13-7).

The Village Concept Alternative would result in the same increase in employment as the SUMC Project. As with the SUMC Project, the Historic Preservation Alternative would be constructed and operational by 2025. The currently projected jobs to employed residents ratio in 2025 is approximately 2.61 (without the Historic Preservation Alternative). Adding the 2,242 new employees to the ratio of 2.61 jobs to employed residents within the City,[79] the Historic Preservation Alternative would increase the 2025 ratio by 0.05, resulting in a 2025 ratio of about 2.66 jobs per employed resident.[80] The

[79] 112,560 jobs to 43,160 employed residents within the City = 2.61

[80] 112,560 jobs in 2025 + 2,242 jobs under the SUMC Project = 114,802 jobs/43,160 employed residents within the City = 2.66

Historic Preservation Alternative would result in the same jobs to employed residents ratio increase as the SUMC Project.

Implementation of Mitigation Measure PH-3.1, as proposed for the SUMC Project, is not directly required in order to mitigate a significant environmental impact under the Historic Preservation Alternative. Instead, this mitigation measure shall be considered as possible additional mitigation for impacts identified under air quality and climate change. However, it should be noted that these measures are presented only in conceptual terms, and the City may find that some or all of them are not feasible for various legal, practical, or other reasons. As such, this measure is presented for informational purposes, and to ensure that all possible options for mitigation of these impacts are adequately considered.

- PH-3.1: Reduce the Impacts on the Jobs to Employed Residents Ratio

Cumulative Impacts. ABAG Projections forecast the housing that would be built within each community up to 2025; therefore, the projections can be treated as cumulative housing development. As such, the cumulative analysis pertaining to indirect housing demand or increases in permanent (residential) population is already provided above. In addition, as with the SUMC Project, cumulative development with this alternative would not have cumulative impacts on the City's jobs to employed residents ratio. (LTS)

Public Services

Demand for Fire Services. Like the SUMC Project, the Historic Preservation Alternative would require an increased level of fire services due to increased employment and on-site activity. With more on-site activity there could be more incidents requiring fire department response. Although this alternative would involve slightly more development than the SUMC Project, the greater amount of development would not require additional fire services than what is required for the SUMC Project. In addition, this alternative would not involve a greater amount of beds or employees than the SUMC Project. Therefore, as with the SUMC Project, this alternative would require three additional full time staff and a new 100-foot ladder fire truck. However, the increased level of fire services would not be large enough to trigger the need for construction of new or expanded facilities that could adversely affect the physical environment or affect human health and safety. This alternative's impacts regarding fire services would be less than significant, like the SUMC Project. (LTS)

Demand for Police Services. As with the SUMC Project, the Historic Preservation Alternative would require an increased level of police services due to increased employment and on-site activity. With more on-site activity, there would likely be additional traffic accidents and other incidents that police officers may be required to respond to. However, the increased level of demand for police services would not be large enough to trigger the need for construction of new or expanded facilities that could adversely affect the physical environment or affect human health and safety. Although this alternative involves slightly more development than the SUMC Project (approximately 12,200 square feet), there would be no increase in onsite employment or occupancy beyond the SUMC Project's level. This alternative would not involve a greater amount of beds or employees than the SUMC Project.

Therefore, like the SUMC Project, this alternative's impacts regarding police services would be less than significant. (LTS)

Demand for Schools. The Historic Preservation Alternative would not involve the construction of new residential units in the City and therefore, would not directly generate students. Nonetheless, similar to the SUMC Project, this alternative would indirectly generate students from induced housing caused by increased employment on the SUMC Sites. However, impacts from the indirectly generated students would be mitigated by the SUMC Project's, and any subsequent residential projects' payment of the school impact fees established by SB 50. (LTS)

Demand for Parks and Recreation. Like the SUMC Project, this alternative would result in an increased demand and utilization of nearby parks and recreational services due to increased employment and on-site activity on the SUMC Sites.[81] As with the SUMC Project, the Historic Preservation Alternative would be required to pay a "Community Facility Fee," which has a line item for parks that would fund acquisition of land and improvements for neighborhood and district parks.[82] Likewise, this alternative's contribution to the General Fund, through fees and taxes, would help finance the maintenance and upkeep of park and recreational facilities. Payment of these fees and taxes would mitigate this alternative's impacts on the City's park and recreational facilities. (LTS)

Cumulative Demand for Services. As discussed in Section 3.14, Public Services, cumulative impacts related to fire protection and parks and recreational demands would be less than significant. Because this alternative would involve a similar (albeit slightly increased) level of development compared to the SUMC Project, then cumulative impacts related to fire protection and parks would also be less than significant with this alternative. However, cumulative demand on police service and schools could necessitate construction of new or expanded facilities, which could result in significant impacts. As discussed in Section 3.14, Public Services, the SUMC Project's contribution to the cumulative need for these new facilities would be less than cumulatively considerable. Because this alternative would involve the same level of development compared to the SUMC Project, then its contribution would also be less than considerable. (LTS)

Utilities

Water Demand. Like the SUMC Project, the Historic Preservation Alternative would have less-than-significant impacts related to water supply. During years of above-normal and normal water supply, the City has sufficient supplies to meet the demands of the Historic Preservation Alternative. During single and multiple dry years, City water supplies from SFPUC are insufficient to meet demands. These supply deficiencies can be met with the implementation of the WSIP, EWSS projects, and dry year demand reductions in accordance with the WSCP. The City's WSCP would be implemented in

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81 DMG-Maximus, City of Palo Alto, Parks and Community Facilities Impact Fee Study, September 18, 2001.

82 City of Palo Alto, *Municipal Codes*, *Section 16.58, Building Regulations,* http://nt2.scbbs.com/cgi-bin/om_isapi.dll?clientID=277797042&infobase=procode-3&softpage=Browse_Frame_Pg, accessed, January 14, 2008.

progressive stages, as needed to achieve a positive balance of supplies and demands during drought years.

This alternative involves more development than the SUMC Project, approximately 12,200 square feet, which is less than one percent of the total net new square footage planned for the SUMC Project. Although this alternative would involve slightly more development than the SUMC Project, the increase would not require substantially greater amounts of water than the SUMC Project. In addition, this alternative would involve the same amount of beds and employees as the SUMC Project. Therefore, this alternative would not require the City to create new or expanded entitlements for water supplies. Also, Stanford has indentified a long list of conservation measures that it proposes to implement to help reduce the water demands of the SUMC project; these measures may be imposed as conditions of SUMC Project approval. It is anticipated that the same conservation measures would apply to this alternative, thus further reducing the demand. Therefore, this alternative would result in less-than-significant impacts related to water demand. (LTS)

Wastewater Generation. As discussed in Section 3.15, Utilities, the SUMC Project would have less-than-significant impacts related to wastewater generation. Although the Historic Preservation Alternative would involve a somewhat greater amount of water use (and associated wastewater generation) when compared to the SUMC Project, this would not be substantial enough to require the expansion or installation of wastewater facilities. As with the SUMC Project, the Historic Preservation Alternative would not cause the existing wastewater facilities to experience substantial physical deterioration that would cause the need for their replacement. Therefore, the construction of the Historic Preservation Alternative would result in a less-than-significant impact related to wastewater generation and the deterioration of wastewater facilities. (LTS)

Stormwater Generation. As discussed in Section 3.15, Utilities, the SUMC Project would have less-than-significant impacts related to stormwater collection system capacity. However, as explained under the Hydrology analysis, the Historic Preservation Alternative may have more impervious surfaces than the SUMC Project, and therefore, increased stormwater flow. The Hydrology analysis for this alternative identified a mitigation that would prohibit an increase in post-construction stormwater runoff. With this measure, impacts related to stormwater facilities would be less than significant.

If the Historic Preservation Alternative is found to have more impervious surfaces than the SUMC Project, then the following mitigation measure would apply. This mitigation measure, which is not identified for the SUMC Project, would reduce the potential Historic Preservation Alternative impacts related to stormwater facilities to less-than-significant levels. (S/LTS)

- *No Net Increase in Runoff*. Prior to receiving a grading or building permit, the SUMC Project sponsors shall develop and implement a Final Site Plan that does not increase the amount of post construction stormwater runoff from the SUMC Sites.

Solid Waste Generation. As discussed in Section 3.15, Utilities, the solid waste facilities that would serve the SUMC Sites have sufficient remaining capacity to accommodate the SUMC Project. Therefore, the solid waste facilities that would serve the SUMC Sites would be sufficient to accommodate the Historic Preservation Alternative and, thus, this alternative would not contribute to the need to expand existing or construct new solid waste disposal facilities. Since the Historic Preservation Alternative would involve only slightly greater amounts of development than the SUMC Project and would not involve a greater amount of beds or employees, this alternative would result in less-than-significant impacts related to solid waste generation. (LTS)

Energy Demand. As discussed in Section 3.15, Utilities, the SUMC Project would have a less-than-significant impact on natural gas and electrical facilities. This alternative involves only slightly more development, less than one percent, than the SUMC Project. In addition, the Historic Preservation Alternative would not include the energy conservation measures that would apply to the SHC clinic/medical office building and the SoM buildings under the SUMC Project, as these buildings would not be constructed under this alternative. However, these energy conservation measures would be applied instead at the renovated 1959 Hospital Building complex and would result in a 30 percent reduction in energy use at this building. The Historic Preservation Alternative would not involve a greater amount of beds or employees than the SUMC Project. However, with this alternative, the demand on energy has the potential to increase from current conditions because of the increase in square footage and on-site activity. Like the SUMC Project, this increase would require the installation of additional feeder cables, which would occur within the same construction footprint as the SUMC Project. As discussed in Section 2, Project Description, the installation of the additional feeder cables is considered a part of the SUMC Project, and impacts associated with this construction activity are analyzed throughout this document. Therefore, like the SUMC Project, this alternative would result in less-than-significant impacts as a result of the installation and rerouting of electrical lines. (LTS)

Cumulative Demand for Utilities. As discussed in Section 3.15, Utilities, cumulative impacts related to solid waste facilities would be less than significant because the SMART Station and Kirby Canyon Landfill would have adequate capacity to serve their service area in 2025.[83, 84] Similarly, cumulative impacts related to water supply facilities are less than significant because the City plans to implement its WSCP in progressive stages, as needed to achieve a positive balance of supplies and demands. Therefore, the City can supply for its projected demands without exceeding SFPUC projected allocations or the City's SFPUC ISG.[85] Likewise, the RWQCP has adequate capacity to serve its service area in 2025.[86]

Also, as discussed in the SUMC Project utilities analysis, the City's electricity, natural gas, and storm water drainage facilities have sufficient capacity to serve the cumulative development of the City in 2025. Future development in the City would generate an increased demand on utility facilities. This increase could require the maintenance and replacement of outdated and deteriorated wastewater facilities. The City has a Capital Improvement Program that provides replacements and maintenance

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83 Debi Sargent, Solid Waste Contract Administrator, City of Sunnyvale, Public Works, electronic communication with PBS&J, November 10, 2008.

84 Guy Petraborg, Kirby Canyon Landfill, electronic communication with PBS&J, November 18, 2008.

85 City of Palo Alto, Water Supply Assessment for Stanford University Medical Center Facilities Renewal and Replacement Project, August 2009.

86 Rick Wetzel, Manager, Water Quality Control Plant in the Public Works Department, City of Palo Alto, electronic communication with PBS&J, November 26, 2007.

for the City's utility facilities.[87] This program is funded by the rates charged by the City to customers for utility services. Any such replacements or maintenance under the Historic Preservation Alternative would comply with all applicable environmental regulations and would have a less than significant potential to contribute to a cumulative impact regarding utility facilities. (LTS)

Village Concept Alternative

Land Use

Dedicating the housing at the three sites to SUMC employees, and constructing the housing within the City's recommended timeline, would have no implications on the analysis in the Stanford CP/GUP EIR and Sand Hill Road EIR.

Conflicts with Applicable Land Use Designations and Zoning. As with the SUMC Project, development proposed under the Village Concept Alternative would require a Comprehensive Plan Amendment and rezoning to accommodate proposed development intensities, which would be adopted prior to any construction. However, prior to implementation of this alternative, rezoning and a Comprehensive Plan Amendment would be adopted, after which no conflict would remain. Therefore, this alternative would not conflict with applicable land use designations and zoning. (LTS)

Conflicts with Comprehensive Plan Policies. With mitigation, no Comprehensive Plan policy conflicts were determined for the SUMC Project. Like the SUMC Project, this alternative would also require mitigation to ensure compliance with Comprehensive Plan policies that protect visual quality, pedestrian safety, historical resources, urban forest resources, groundwater and stormwater runoff, air quality degradation, and noise incompatibility. Additionally, this alternative would further promote land use and transportation policies pertaining to the pedestrian safety and enhancement of pedestrian facilities, although mitigation measure to include additional infrastructure improvements for pedestrian would still apply. Like the SUMC Project, this alternative would include a Comprehensive Plan Amendment to revise the language of Policy L-8 to clarify the exemption of hospital, clinic, and research buildings from square footage caps. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations
- TR-6.1: Bicycle and Pedestrian Infrastructure Improvements
- AQ-1.1: Implement Recommended Dust Control Measures
- AQ-1.2: Implement Diesel Emission Reduction Measures
- NO-1.1: Implement Best Management Practices to Reduce Construction Noise
- NO-4.1: Shield or Enclose HVAC Equipment and Emergency Generators
- BR-4.1: Prepare a Tree Preservation Report for all Trees to be Retained
- BR-4.2: Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks

[87] City of Palo Alto, http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=3954, accessed November 24, 2008.

- BR-4.3: Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention
- BR-4.4: Provide a Tree Preservation Bond/Security Guarantee
- BR-4.5: Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category
- CR-1.1: Manually Demolish Structures at the Hoover Pavilion Site
- CR-1.2: Prepare HABS Documentation for the Stone Building Complex
- CR-1.3: Prepare and Distribute Written and Photographic Documentation to Agencies
- CR-1.4: Prepare Permanent Interpretive Displays/Signage/Plaques
- CR-1.5: Implement Protection Documents for the Hoover Pavilion
- HW-3.1: Develop Workplan for any Unknown Contaminated Sites
- *No Net Increase in Runoff* (New mitigation measure not identified for the SUMC Project; see Hydrology analysis for this alternative)

Compatibility with Adjacent Land Use Character and Conflicts with Established Residential, Recreational, Educational, Religious, or Scientific Uses in the Area. Although development under the Village Concept Alternative would be more intense than under current conditions, the alternative would not introduce a new land use that would conflict with existing uses. As such, no impact would occur, like the SUMC Project. (NI)

Division of an Established Community and Farmland Conversion. The SUMC Project would have no impact on the division of an established community or farmland conversion. Similarly, the Village Concept Alternative would not add physical barriers that might result in restriction of customary circulation patterns or a disruption of land use connectivity. In fact, the Village Concept Alternative would include pedestrian linkages that would improve connectivity between the three housing sites, the SUMC Sites, the Stanford Shopping Center, and PAITS. The alternative would also not require the acquisition and development of lands currently used for agricultural purposes. As such, no impact would occur. (NI)

Adverse Changes to Existing or Planned Land Use Pattern. Although amended land use designations and zoning would be required to implement the SUMC Project portion of the Village Concept Alternative, this alternative would maintain the existing overall land use pattern and type (which includes the previously approved housing). However, the Village Concept Alternative would involve an intensification of land uses. This intensification of land uses would be limited to the SUMC Sites and minor pedestrian linkages in the area. Like the SUMC Project, the Village Concept Alternative would have a significant impact on visual character at the SUMC Sites and on views from sensitive vantage points. The pedestrian linkages under the Village Concept Alternative would have a negligible impact on on-site character and views. Without implementation of the City's Architectural Review process to ensure appropriate alignment of proposed structures, the increased building mass under the Village Concept Alternative would have a significant impact on existing character and views, as with the SUMC Project. Implementation of Mitigation Measure VQ-2.1, as presented in Section

3.3, Visual Quality, would reduce the significant impacts on overall surroundings to a less-than-significant level. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Cumulative Impacts. This alternative, in combination with other reasonably foreseeable probable future development in the area, would have a less-than-significant cumulative impact on overall existing or planned land uses in the vicinity of the SUMC Sites. Any major development within the City, including this alternative and other adjacent projects, such as the construction of a three-story replacement medical office building at 777 Welch Road, would be subject to the City's Architectural Review process. Similarly, the SUMC Project would not contribute to a cumulative land use conflict. (LTS)

Visual Quality

Dedicating the housing at the three sites to SUMC employees, and constructing the housing within the City's recommended timeline, would have no implications on the analysis in the Stanford CP/GUP EIR and Sand Hill Road EIR.

Temporary Degradation of Visual Quality. Like the SUMC Project, the Village Concept Alternative would result in significant impacts during construction. The addition of enhanced pedestrian linkages in the Village Concept Study Area would expand the amount of construction activity, albeit on a minor level. Mitigation similar to VQ-1.1, involving a Construction Visual Improvement Plan, to be applied to both the SUMC Project and pedestrian construction, as needed, would reduce the impact to less than significant. (S/LTS)

- VQ-1.1: Implement Construction Visual Improvement Plan

Permanent Degradation of Visual Character Post Construction. Similar to the SUMC Project, the Village Concept Alternative would alter the SUMC Sites by increasing on-site massing, reconfiguring on-site layout, altering on-site landscaping and lighting, and incorporating new building materials and treatments. However, the new pedestrian amenities would add street striping, canopies, signage, and potentially increase lighting for pedestrian orientation. These amenities would be introduced into a predominantly developed area, and would have a negligible impact on the overall existing visual character of the Village Concept Study Area. However, additional street trees would be added in the Village Concept Study Area, which would enhance visual character. Nonetheless, as with the SUMC Project, visual impacts would be significant and development under this alternative would be required to adhere to the below mitigation measure requiring compliance with the City's Architectural Review process and recommendations. Mitigation such as Mitigation Measure VQ-2.1, involving compliance with the City's Architectural Review process, although throughout Village Concept Study Area, would ensure less-than-significant impacts. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Alternation of Public View Sheds, View Corridors, or Scenic Roads. Impacts of the Village Concept Alternative on views would be similar to those of the SUMC Project. The Village Concept Alternative would involve the same massing as the SUMC Project, and the enhanced pedestrian linkage would not further impact views. As such, the Village Concept Alternative would have significant impacts on views, and these impacts would be reduced to less than significant with mitigation such as Mitigation Measure VQ-2.1, involving compliance with recommendations by the Architectural Review Board during the City's Architectural Review process. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Terrain Modification. Since the SUMC Sites and the pedestrian linkage areas are relatively flat, the Village Concept Alternative would have no impact on terrain modifications, as with the SUMC Project. (NI)

New Sources of Light and Glare. Similar to the SUMC Project, the Village Concept Alternative would increase exterior lighting at SUMC Sites. However, the new pedestrian amenities would include increased lighting for pedestrian orientation. The pedestrian lighting amenities would be introduced into a predominantly developed area, and would have a negligible impact on the overall existing visual character of the Village Concept Study Area. Nonetheless, the Village Concept Alternative would undergo Architectural Review by the City, as required by Mitigation Measure VQ-2.1. Therefore, light and glare impacts under the Village Concept Alternative would be reduced to less than significant. (S/LTS)

- VQ-2.1: Comply with City's Architectural Review Process and Recommendations

Shadowing Public Open Spaces. New shadows would be cast under the Village Concept Alternative and the impacts are expected to be similar in scale to those of the SUMC Project since the increased floor area and building mass would be similar. It is not anticipated that the enhanced pedestrian linkage would result in substantial shadows. Therefore, the Village Concept Alternative would result in a less-than-significant impact, similar to the SUMC Project. (LTS)

Cumulative Impacts. As discussed in Section 3.3, Visual Quality, cumulative impacts associated with visual character, sensitive views, light and glare, and shadowing would be less than significant. As this alternative would have the same intensity of development as the SUMC Project, with the addition of pedestrian amenities that would have a minor visual impact, cumulative impacts would also be less than significant. All projects in Palo Alto would be required to undergo architectural review by the City and adhere to Section 18.23.030 of the Municipal Code. (LTS)

Transportation

This alternative would include recommendations that (1) the 490 environmentally cleared units would be occupied by SUMC Project employees, and (2) the 490 units would be constructed within two to four years after issuance of building permits for the SUMC Project. Of the 490 housing units, 420 units would be located at Quarry Road and El Camino Real, and Quarry Road and Arboretum Drive, within County jurisdiction, and within the Stanford CP/GUP coverage area. As previously discussed, the Stanford CP/GUP EIR transportation analysis assumed the 420 units would be occupied by graduate students and post doctoral fellows. As such, that analysis applied trip generation rates specific to campus residents, including trip rates for graduate students and post doctoral fellows.[88] The trip rate of SUMC employee occupants of the housing would be higher than the trip rates for graduate students and post doctoral fellows. However, the 420 units are a small portion of the much larger, ten-year development under the GUP, which includes over 2 million square feet of academic facilities and over 3,000 housing units within Stanford University lands (see Section 3.1, Introduction to the Environmental Analysis, for a description of development under the GUP). Therefore, the change in occupancy of the Quarry Road/El Camino Real/Arboretum Road sites would have minor implications on the Stanford CP/GUP EIR. Nonetheless, the below analysis captures the new trip generation associated with the Quarry Road housing units, and its implications on the local roadway network.

Construction Impacts. The SUMC Project would have significant construction-period impacts. The Village Concept Alternative would increase the SUMC Project's construction-period impacts, assuming that the pedestrian amenities would also be constructed in the surrounding roadways. Mitigation such as Mitigation Measures TR-1.1 through TR-1.9, involving construction-period measures, throughout the Village Concept Study Area, would reduce the impact to less than significant. (S/LTS)

- TR-1.1: Provide Off-Street Parking for Construction Related Vehicles
- TR-1.2: Maintain Pedestrian Access
- TR-1.3: Maintain Bicycle Access
- TR-1.4: Restrict Construction Hour
- TR-1.5: Restrict Construction Truck Routes
- TR-1.6: Protect Public Roadways During Construction
- TR-1.7: Maintain Public Transit Access and Routes
- TR-1.8: Prepare and Implement Construction Impact Mitigation Plan
- TR-1.9: Conduct Additional Measures During Special Events

Operational Impacts. The assumptions for the Village Concept Alternative differ from the SUMC Project in two major ways. First, 490 units at the Quarry Road and Sand Hill Road housing sites would be occupied by SUMC Project employees. As such, a greater number of SUMC employees would be living within walking distance of the SUMC Sites. Second, the Village Concept Alternative would create a walkable, bikeable, mixed-use, transit-oriented and well-connected urban environment. As such, this alternative would strengthen the pedestrian linkages between where people live, and where they work, shop, or go to school. To make it possible for people to easily walk from place to place, this alternative would include several improvements to the bicycle and pedestrian network, above and beyond the improvements that would be implemented as part of the SUMC Project. These additional improvements, as explained in more detail under the description of the Village Concept Alternative, include new Class I shared-use bicycle and pedestrian path extending from the planned Everett under-crossing at Caltrain to El Camino Real; intersection improvements (including at intersections #35, #56, and #8, as identified in Section 3.4, Transportation); new Stanford Barn area

[88] County of Santa Clara, *Stanford University Draft Community Plan and General Use Permit Application, Final Environmental Impact Report*, Section 4.4.E.3, Future Trip Generation with General Use Permit, certified by the Santa Clara County Board of Supervisors, December 2000.

ADA accessible pedestrian crossings; and new transit centers. In terms of transportation impacts, these changes would result in slightly different impacts than would occur under the SUMC Project. This alternative would have a higher mode share for walk (and bicycle) trips, due to a higher percentage of SUMC employees living within walking distance of the SUMC.

Vehicle trip generation for the AM and PM Peak Hours for this alternative would be approximately two to five percent lower than for the SUMC Project. This alternative would result in a net decrease from the SUMC Project of 14 vehicle trips in the AM Peak Hour and 37 vehicle trips in the PM Peak Hour.

These vehicle trips from this alternative would result in significant impacts at six intersection during the AM Peak Hour and 12 intersections during the PM Peak Hour. Comparatively, the SUMC Project would significantly impact five intersections in the AM Peak Hour and 12 intersections in the PM Peak Hour. Therefore, this alternative would result in one more intersection (Alpine Road / I-280 southbound off-ramp) being impacted in the AM Peak Hour, than with the SUMC Project. This increase is largely due to the different assumptions regarding the residents of the three housing sites on Quarry and Sand Hill Roads. That is, the SUMC employees are assumed to have spouses and children (average family size of 2.2 persons per unit). Even though the member of the family that is working at SUMC may be walking to work, the other adult family members may also be working (at someplace other than SUMC), and would contribute vehicle trips to the surrounding roadway network and intersections.

The pedestrian improvements that would be implemented as part of this alternative would make walking and biking safer and more attractive modes of travel. The improvement could thus result in higher levels of bicycle and pedestrian traffic on the sidewalks, paths, undercrossing, and crosswalks in the Village Concept Alternative Study Area. The higher volumes of traffic would require additional crossing times at intersections. Since auto traffic is stopped while pedestrians are crossing the street, increasing the amount of time for the movement of pedestrians would result in less time available for the movement of vehicles. To evaluate the resulting impact on LOS at study intersections, an analysis was conducted for the below three intersections. The analysis assumed that pedestrian crossing times at these three intersections would be increased by factors of 1.5 and 2.0. The corresponding changes to LOS at these three test intersections are as follows:

- LOS at El Camino Real and Quarry Road (intersection #8) would deteriorate from B to E in the AM Peak Hour, and from C to D in the PM Peak Hour. Impacts would be significant in the AM Peak Hour.
- LOS at Arboretum Road and Quarry Road (intersection #35) would deteriorate from C to E in the AM Peak Hour, and from C to D in the PM Peak Hour. Impacts would be significant in the AM Peak Hour.
- LOS at Welch Road and Quarry Road (intersection #56) would deteriorate from C to D in the AM Peak Hour, and would remain at C in the PM Peak Hour. Impacts would be less than significant in both the AM and PM Peak Hour.

Other study intersections would probably be similarly impacted by an increase in pedestrian crossing time. Therefore, the pedestrian enhancements mentioned above that are part of the Village Concept Alternative could increase the number of adversely impacted intersections above six in the AM Peak Hour, and 12 in the PM Peak Hour. Therefore, this alternative would likely have several more adversely impacted intersections than would occur under the SUMC Project.

Intersection improvements, such as adding turn lanes, changing how some lanes are used, and signalization would mitigate the significantly affected intersections under this alternative. However, the feasibility of implementing all improvements is uncertain. The City of Palo Alto has a stated policy which advocates a multi-modal approach to addressing traffic congestion as opposed to an approach that increases roadway capacity. Adding roadway capacity also runs counter to the underlying idea of the Village Concept Alternative.

A more viable approach to mitigation involves the implementation of several more feasible measures, each of which would contribute to a partial reduction in the Village Concept Alternative's impacts. These measures include the installation of traffic adaptive signal technology in selected corridors, the construction of two additional bicycle and pedestrian undercrossings in Palo Alto and Menlo Park, the provision of an enhanced TDM program, and implementation of intersection improvements that are considered to be feasible.

- TR-2.1: Traffic Adaptive Signal Technology
- TR-2.2: Additional Bicycle and Pedestrian Undercrossings
- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- TR-2.4: Fund or Implement those Intersection Improvements that Have Been Determined to be Feasible
- TR-2.5: Coordinate with Other Jurisdictions for Potentially Feasible Roadway Improvements

After implementation of these measures, there would no longer be any adversely impacted intersections in the AM Peak Hour. However, there would still be four adversely impacted intersections in the PM Peak Hour. Therefore, even with the implementation of these measures, there would still be a significant and unavoidable impact on intersection LOS, and the Village Concept Alternative would have a significant and unavoidable impact on intersection LOS, like the SUMC Project. (S/SU)

Impacts on Roadway Segments. The SUMC Project would have a significant impact on several roadway segments in the City of Menlo Park in 2025; the Village Concept Alternative would also significantly impact the same roadway segments. Mitigation involves funding projects that will result in a shift in the mode of travel for SUMC employees, from automobile to walk, bike, bus, and train. These measures include providing additional bicycle and pedestrian undercrossings (Mitigation Measure TR-2.2), providing an enhanced TDM program (Mitigation Measure TR-2.3), and financial contributions to the City of Menlo Park's shuttle fee (Mitigation Measure TR-7.2).

However, even with implementation of these three measures, there would still be significant impacts on four Menlo Park roadways, including Marsh Road, Willow Road, Sand Hill Road, and Alpine Road. Therefore, just as with the SUMC Project, the traffic impacts to these roadway segments would remain significant and unavoidable with mitigation. (S/SU)

- TR-2.2: Fund Additional Bicycle and Pedestrian Undercrossings
- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- TR-7.2: Expand Public Transit Services

Local Circulation Impacts. The traffic projections for Welch Road for the Village Concept Alternative would be approximately the same as for the SUMC Project, except that bicycle and pedestrian flows would be higher with the Village Concept Alternative. The future vehicle volumes would approach the capacity of a two-lane roadway with a center turn lane. Just as with the SUMC Project, the high volume of vehicle traffic, combined with the numerous turning vehicles, pedestrian movements across and along Welch Road and bicycle travel along Welch Road will potentially create a safety hazard which is a significant impact.

Due to the shortness of the link, there is also the possibility that the queue to make the westbound left turn from Durand Way to Sand Hill Road would back up all the way to the intersection of Welch Road and Durand Way. This would also be a significant impact.

The safety hazard on Welch Road can be mitigated by requiring the SUMC Project sponsors to fund an independent traffic study to determine whether the private street connection between Roth Way and Pasteur Drive should be operated as a public street. The overflowing queue can be mitigated by requiring the SUMC Project sponsors to pay for the development and implementation of a signing and striping plan for the Durand Way extension, and for the installation and optimization of the two signals at the intersections of Durand/Sand Hill and Durand/Welch. With implementation of these two measures, the potentially significant local circulation impacts would be reduced to less-than-significant levels. (S/LTS)

- TR-4.1: Traffic Impact Study
- TR-4.2: Fund Signing and Striping Plan and Signal Optimization

Freeway Impacts. The SUMC Project would have a less-than-significant impact on freeway LOS in 2025. The Village Concept Alternative would add slightly more trips to some freeway segments, and would send slightly fewer trips to other freeway segments, than the SUMC Project. But as with the SUMC Project, this alternative would not add enough trips to either US 101 or I-280 to cause a significant impact. (LTS)

Bicycle and Pedestrian Impacts. Bicycle and pedestrian traffic in and around the SUMC Sites is currently very extensive. By enhancing bicycle and pedestrian linkages and housing SUMC employees near their jobs, the Village Concept Alternative is anticipated to result in even higher levels of bicycle and pedestrian activity than the SUMC Project. Also, there would be increased intersection congestion due to this alternative. Both the increase in bicycle and pedestrian activity and project-generated traffic would result in an increase in hazards to pedestrian and bicyclists, which would be a significant impact under both the SUMC Project and this alternative. Mitigation involving bicycle and pedestrian intersection improvements would reduce the impact to less than significant. (S/LTS)

- TR-6.1: Bicycle and Pedestrian Infrastructure Improvements

Transit Impacts. The transit oriented design of the Village Concept Alternative, combined with the increase in employment and activity at the SUMC Sites, could result higher ridership on the transit routes serving the SUMC Sites and the larger Village Concept Study Area. The resulting increase in ridership could exceed the capacity of the various transit services to and from the SUMC Sites and the larger Village Concept Study Area. As such, the Village Concept Alternative could result in a significant impact on transit.

Furthermore, with implementation of the above mentioned Mitigation Measure TR-2.3 (enhancing the TDM program, including provision of Caltrain GO Passes to SUMC employees or equivalent TDM measure), it is expected that there would be a gradual mode shift, from commuting by automobile to commuting by public transit, by a significant percentage of hospital employees.

This mode shift is anticipated to be even more pronounced for the Village Concept Alternative than the SUMC Project, because transit is projected to play an even bigger role for SUMC employees. The intent of this alternative is to create a higher density, mixed use, pedestrian friendly, transit oriented (TOD) type of village. This type of design is likely to result in higher levels of transit ridership, and therefore even greater impacts to transit.

This mode shift may take some amount of time to be realized, due to the fact that many people cannot immediately change their commuting habits. However, it is expected that the transit mode share for SUMC employees would gradually increase from the current 8.9 percent to approximately 21 percent. At this level of transit ridership, the level of auto use would be reduced to a level where many of the intersection impacts are reduced to less-than-significant levels.

However, the combination of the enhanced TDM program and the transit-oriented focus of this alternative would translate into increased transit ridership. This increased ridership could push load factors on many of the local shuttles to above 1.0, indicating overcrowding on the buses. Impacts to transit service in the Study Area are considered a significant impact according to City of Palo Alto criteria.

With implementation of the following mitigation measures, this alternative would have a less-than-significant transit impact, as with the SUMC Project. (S/LTS)

- TR-7.1: Incorporate Transit Centers into Site Plans
- TR-7.2: Provide Expanded Transit Service

Parking Impacts. The SUMC Project would have less-than-significant parking impacts. The VCA would provide the same amount of parking on the SUMC Sites, but would probably result in fewer SUMC employees driving to work. Therefore, parking impacts under the VCA would also be less than significant. (LTS)

Emergency Impacts. As indicated in Section 3.4, Transportation, as well as the Transportation Analysis, the SUMC Project would have a significant impact on emergency vehicle access due to its increased roadway congestion. The Village Concept Alternative would increase roadway congestion to a slightly greater extent than the SUMC Project. It would also add more bicycle and pedestrian traffic to intersections, thus slowing down vehicular traffic, including emergency access vehicles. Therefore, this alternative would also have significant impacts on emergency vehicle access. The same emergency access mitigation identified in Section 3.4, Transportation, would reduce this alternative's impact on emergency access to a less than significant level. (S/LTS)

- TR-9.1: Pay Fair Share Towards OptiCom Installation

Cumulative Impacts. LOS impacts under the analysis above already account for cumulative growth through 2025 because this growth has been incorporated in the City of Palo Alto Travel Demand Forecasting Model, which is the basis for 2025 conditions. This growth is also accounted for in the above analysis of pedestrian and emergency access impacts. Those analyses that incorporate cumulative growth in the City of Palo Alto Travel Demand Forecasting Model already capture a cumulative analysis, and no further cumulative discussions for those topics are provided here. Parking impacts are site-specific and do not cumulate with other projects. As such, the only transportation-related impacts to which a cumulative analysis applies are construction-period and transit impacts.

As with the SUMC Project, cumulative impacts on transit would be less than significant since transit agencies would necessarily adjust the distribution of transit vehicles to accommodate demand. However, there would be significant cumulative impacts during construction of both the SUMC Project and the Village Concept Alternative. Due to the intense construction required under the Village Concept Alternative, this alternative's contribution to the cumulative impact would be considerable, like the SUMC Project. Mitigation Measures TR-1.1 through TR-1.9, as identified above, would reduce the contribution to less than cumulatively considerable. (S/LTS)

Air Quality

Construction Criteria Air Pollutant Emissions. Under the Village Concept Alternative, the same large-scale activity/equipment use would still be required for demolition, excavation/foundation work, and new building construction. This alternative would have the same intensity of construction during early construction phases, along with the same significant equipment-related NO_x emissions identified for the SUMC Project. Construction of pedestrian linkages would result in minimal construction-period emissions. This alternative would require the implementation of standard BAAQMD control measures for fugitive dust and diesel emissions just as the SUMC Project. However, although the below mitigation measures would reduce construction dust impacts to less-than-significant levels, NO_x emissions could remain significant and unavoidable, similar to the SUMC Project. (S/SU)

- AQ-1.1: Implement Recommended Dust Control Measures
- AQ-1.2: Implement Diesel Emission Reduction Measures

Operational Criteria Air Pollutant Emissions. The new structures would contain the same new stationary pollutant sources and would require the same amounts of chilled water/steam from the Central Energy Facility with the same associated air pollutant emissions as the SUMC Project. However, the development of housing on three nearby sites with preferential occupancy by SUMC employees would slightly lessen the additional new motor vehicle trips and air pollutant emissions associated with hospital and medical offices, as shown in Table 5-12. The Village Concept Alternative's NO_X and PM_{10} emissions would remain significant; daily ROG emissions would also remain significant, but annual ROG would fall just below the BAAQMD significance threshold. Although the new residents at the three housing sites would add slightly to traffic on local streets, CO modeling for the SUMC Project shows that CO concentrations there are so far below the air quality standards that there is no potential for violations. This alternative would have a less-than-significant impact associated with localized concentrations of CO.

Even with mitigation involving an enhanced TDM program, and possibly the implementation of mitigation to reduce impacts to the jobs to employed residents ratio, below, operational impacts would remain significant and unavoidable, although with less vehicular emissions compared to the SUMC Project. (S/SU)

- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- PH-3.1: Reduce the Impacts on the Jobs to Employed Residents Ratio

Table 5-12
Village Concept Alternative Daily Operational Stationary and Mobile Source Emissions (with Mitigation Involving an Enhanced TDM Program)

	Emissions (Pounds per Day/Tons per Year)					
Emission Source	**ROG**	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Stationary (On-Site)	5.67/ 1.04	5.86/ 1.07	6.45/ 1.18	0.00/ 0.00	0.02/ 0.00	0.02/ 0.00
Central Energy Facility	----	110/ 20.08	37/ 6.75	----	----	----
Mobile	78.28/ 13.81	94.70/ 16.13	886.77/ 162.61	2.07/ 0.39	404.29/ 73.79	75.98/ 13.86
Total Emissions	**83.95/ 14.85**	**210.56/ 37.28**	**930.22/ 170.54**	**2.07/ 0.39**	**404.31/ 73.79**	**76.00/ 13.86**
BAAQMD Thresholds	**80/15**	**80/15**	**NT**	**NT**	**80/15**	**NT**
Significant Impact?	**Yes/No**	**Yes/Yes**	**NT**	**NT**	**Yes/Yes**	**NT**

Source: PBS&J, 2010. Based on year 2025 emission factors.
Notes:
NT = No threshold.
Estimates are results of modeling using the CARB URBEMIS 2007 version 9.2.4.

Construction and Operational TACs. The SUMC Project Health Risk Assessment evaluated TAC emissions from construction equipment and new operational sources (i.e., emergency diesel generators, delivery trucks, and additional medical helicopter flights/heliport) and found the associated health impacts to be less than significant. Under the Village Concept Alternative**,** construction and operational

TACs sources and emissions would be the same as for the SUMC Project. However, the residential uses introduced at the three housing sites would be TAC-sensitive and would be exposed to TAC emissions from SUMC Project construction and operation. Extension of the Health Risk Assessment to evaluate TAC impacts at these three sites showed that health risks to future residents would be well below the significance thresholds (see Appendix Q). Thus, construction and operational TAC impacts for this alternative would be less than significant. (LTS)

Cumulative Impacts. The SUMC Project's emissions of NO_x during construction and of TACs during construction and operation were identified as making cumulatively considerable contributions to significant cumulative impacts. Under the Village Concept Alternative**,** emissions of NO_x during construction would also exceed the BAAQMD's 80 lbs/day threshold and the TACs emitted during construction and operation, being the same as for the SUMC project, would make a cumulatively considerable contribution to the high TAC background levels of the area in which the SUMC Sites are located. The same construction-period Mitigation Measure AQ-1.2, mentioned above, would help reduce TAC emission from this alternative, but not to a less than considerable level. Consequently, this alternative's construction NO_x emissions and cumulative TAC impacts would be cumulatively significant. (S/SU)

Climate Change

The main difference between the SUMC Project and the Village Concept Alternative is the vehicle miles traveled associated with this alternative. Both the Village Concept Alternative and the SUMC Project were analyzed with and without Mitigation Measure TR-2.3, which required an enhanced TDM program. As determined by AECOM Transportation,[89,90,91] VMT was calculated as shown in Table 5-13 (see VMT calculation memorandum by AECOM, provided as Appendix R).

Table 5-13
Comparison of Vehicle Miles Traveled for SUMC Project and Village Concept Alternative

	SUMC Project VMT	Village Concept Alternative VMT
Without mitigation measure TR-2.3 (employee, patient and spouse trips)	306,098	280,235
Without mitigation measure TR-2.3 (employee and patient trips only)	275,566	265,682
With mitigation measure TR-2.3 (employee and patient trips only)	238,355	236,245

Source: URBEMIS 2007
*Note: t*he VMT numbers vary slightly from the VMT in the AECOM memos due to rounding in the URBEMIS model.

89 AECOM Transportation, *Stanford EIR Alternative Analysis – Village Concept VMT* Memo to Trixie Martelino, dated February 11, 2010.
90 AECOM Transportation, *Stanford EIR – Revised VMT Calculations for SUMC* Memo to Trixie Martelino, dated February 11, 2010.
91 AECOM Transportation, *VCA VMT with Enhanced TDM – Correction, electronic communication with Trixie Martelino,* dated March 30, 2010.

Consistency with the Climate Protection Plan. The Village Concept Alternative is assumed to include an Emissions Reduction Program, similar to the SUMC Project. However, incorporation of the proposed design measures along with proposed mitigation would not ensure that the Village Concept Alternative would meet the goals of the City's Climate Protection Plan. (S/SU)

Construction Greenhouse Gas Emissions. Construction emissions with this alternative would slightly increase from the 6,213.91 MT CO_2e greenhouse gas emissions estimated from the SUMC Project. This potential increase is due to the construction of additional/enhanced of the pedestrian linkages. Construction emissions are regulated on a basin-wide basis, rather than for individual projects. Thus, the construction greenhouse gas emissions projected for the Village Concept Alternative would not be considered significant provided it incorporated the BAAQMD recommended reduction measures, as listed below.

Operational Greenhouse Gas Emissions. The net increase in floor area of the SUMC Project under the Village Concept Alternative would be identical to that of the SUMC Project. However, it is assumed that 490 nearby residential units would be dedicated for use by SUMC employees, and pedestrian linkages would be added/enhanced to encourage the use of alternative modes of transportation. As shown in Table 5-14, the vehicle miles traveled are anticipated to decrease with the implementation of the Village Concept Alternative, which would result in an overall decrease in emissions from the SUMC Project.

Table 5-14
Village Concept Alternative Greenhouse Gas Emissions (Compared to SUMC Project)

Source of Emissions	Village Concept Alternative Without TDM (265, 682 VMT) (MT CO_2e)	SUMC Project Without TDM (275,566 VMT) (MT CO_2e)
Natural Gas (therms)	22	22
Diesel Generators (gallons)	23	23
Medical Nitrous Oxide (cubic feet)	99	99
Fleet Vehicle Fuels (gallons)	100	100
Helicopter Fuel (gallons)	201	201
Electricity (MWh)	-	-
Steam and Chilled Water (MBtu)	19,542	19,542
Non-fleet Vehicular Emissions (VMT)[a]	39,773	41,257
Solid Waste (tons)	480	480
Total Emissions	**60,240**	**63,035**

Source: Reductions provided by PBS&J, 2010 (Appendix E), and AECOM, 2010 (Appendix P).

Notes:

a. Calculated using VMT assumptions reported in AECOM Transportation, February and March, 2010. Emissions were modeled using the VMT assumptions from AECOM in the URBEMIS 2007 software. The numbers vary slightly from the VMT in the AECOM memos due to rounding purposes for the URBEMIS model. AECOM Transportation, February 11, 2010 Memorandum to Trixie Martelino, Revised VMT Calculations for SUMC Project, AECOM Transportation Stanford University Medical Center Draft Environmental Impact Report Transportation Impact Analysis Alternatives Analysis, March 2010.

Table 5-14 considers just the VMT reduction from SUMC employees occupying the housing sites; it does not account for spousal trips to transit or separate jobs. If those spousal trips are accounted for, then VMT from the Village Concept Alternative would increase compared to the SUMC Project, as discussed later in this section.

AB 32, the CARB's Scoping Plan, incorporates a 30 percent reduction target from 2020 BAU emissions limits. The City's Climate Protection Plan's incorporates this BAU approach to quantify emissions from significant, new projects which were not included in the City's existing inventory. As such, this analysis applies the 2020 reduction goal (equivalent to 30 percent below BAU) as a target threshold for compliance with the City Climate Protection Plan. Based on Table 5-14, this alternative is anticipated to result in up to a 2.45 percent decrease in emissions from the proposed SUMC Project. This is a 27 percent increase from existing conditions. The reduced vehicle trips coupled with the reductions from the Emissions Reduction Program would minimize greenhouse gas emissions by approximately 18 percent. Therefore, the Village Concept Alternative must employ additional mitigation measures to further reduce emission impacts.

Mitigation applied to the SUMC Project would also apply to this alternative. Mitigation Measures CC-1.1 through CC-1.5, would reduce the Village Concept Alternative's greenhouse gas emissions and would further the policies of the Climate Protection Plan. In addition, the City shall consider the feasibility of Mitigation Measure PH-3.1, as identified in Section 3.13, Population and Housing.

- TR-2.3: Enhance Stanford University Travel Demand Management (TDM) Program
- CC-1.1: Commissioning and Retro-Commissioning of Energy Systems for New and Existing Buildings
- CC-1.2: Preparation of a Waste Reduction Audit
- CC-1.3: Annual Greenhouse Gas Reporting
- CC-1.4: Participation in PaloAltoGreen Energy Program
- CC-1.5: BAAQMD Construction Emission Reduction Measures
- PH-3.1: Reduce the Impacts on the Jobs to Employed Residents Ratio

Incorporation of the mitigation measures would reduce emissions from the Village Concept Alternative to 55,863 metric tons CO_2e per year (Table 5-15), a decrease of 0.59 percent from the SUMC Project but an increase of 25 percent over existing emissions. As shown in Table 5-14, the resulting greenhouse gas emissions reduction from the Village Concept Alternative would be 23.81 percent less than the BAU emissions. This reduction would be below the 30 percent reduction from BAU emissions. Therefore, even with Mitigation Measures CC-1.1 through CC-1.4, TR-2.3, and possibly PH-3.1, the Village Concept Alternative's contribution to global climate change would be cumulatively considerable and would contravene the goals of the Climate Protection Plan. (S/SU)

Although this alternative provides preferential housing for employees of the SUMC facilities, there may be other members of the household that have to drive to work. With the inclusion of spousal trips, there would be an increase in VMT for both the SUMC Project and the Village Concept Alternative. Table 5-16 shows the increase in VMT and the resulting emissions from the inclusion of the spousal trips.

Result in Significant Emissions of Greenhouse Gases. Even with the implementation of all feasible mitigation measures, emissions reductions afforded the Village Concept Alternative would not achieve either the City of Palo Alto's Climate Protection Plan or the CARB's reduction emission goals of 30 percent below BAU emissions. Because these reduction levels cannot be achieved, the Village Concept Alternative would emit significant amounts of greenhouse gas and would have a cumulatively considerable contribution to global climate change. (S/SU)

Table 5-15
Mitigated Village Concept Alternative Greenhouse Gas Emissions (Compared to SUMC Project)

Source of Emissions	Village Concept Alternative With TDM (236,422 VMT) (MT CO_2e)	SUMC Project With TDM (238,355 VMT) (MT CO_2e)
Natural Gas (therms)	22	22
Diesel Generators (gallons)	23	23
Medical Nitrous Oxide (cubic feet)	99	99
Fleet Vehicle Fuels (gallons)	100	100
Helicopter Fuel (gallons)	201	201
Electricity (MWh)	-	-
Steam and Chilled Water (MBtu)	19,542	19,542
Non-fleet Vehicular Emissions (VMT)[a]	35,390	35,724
Solid Waste (tons)	480	480
Total Emissions	**55,863**	**56,190**

Source: Reductions provided by PBS&J, 2010 (Appendix E), and AECOM, 2010 (Appendix P).

Notes:

a. Calculated using VMT assumptions reported in AECOM Transportation, February and March, 2010. Emissions were modeled using the VMT assumptions from AECOM in the URBEMIS 2007 software. The numbers vary slightly from the VMT in the AECOM memos due to rounding purposes for the URBEMIS model. AECOM Transportation, February 11, 2010 Memorandum to Trixie Martelino, Revised VMT Calculations for SUMC Project, AECOM Transportation Stanford University Medical Center Draft Environmental Impact Report Transportation Impact Analysis Alternatives Analysis, March 2010.

Table 5-16
Comparison of Greenhouse Gas Emissions with Inclusion of Spousal Trips

	MT CO_2e	
	Village Concept Alternative	SUMC Project
Net Emissions	Without TDM	Without TDM
Vehicle miles traveled	280, 235	306,098
Total Emissions	**62,504**	**75,013**

Source: PBS&J 2010 (Appendix E), AECOM, February 11, 2010, AECOM, March 2010.

Notes

a. Calculated using VMT assumptions reported in AECOM Transportation, February and March, 2010. Emissions were modeled using the VMT assumptions from AECOM in the URBEMIS 2007 software. The numbers vary slightly from the VMT in the AECOM memos due to rounding purposes for the URBEMIS model. AECOM Transportation, February 11, 2010 Memorandum to Trixie Martelino, Revised VMT Calculations for SUMC Project. AECOM Transportation Stanford University Medical Center Draft Environmental Impact Report Transportation Impact Analysis Alternatives Analysis, March 2010.

Noise

Construction Impacts. Under the Village Concept Alternative, the types of construction activities would be similar to the SUMC Project, with minor expansions due to the pedestrian linkages. As with the SUMC Project, construction noise impacts under this alternative would still be significant for on-site receptors. However, Mitigation Measure NO-1.1 would not reduce construction noise to less than significant. (S/SU)

- NO-1.1: Implement Best Management Practices to Reduce Construction Noise

Operational Impacts. Under the Village Concept Alternative, operational noise from on-site HVAC equipment, emergency generators, and loading dock/parking facility operations would be the same as the SUMC Project. That is, there would be significant noise from mechanical equipment but Mitigation Measure NO-4.1 would reduce the impact to less than significant.. Medical helicopter flyovers and heliport locations would be the same as the SUMC Project and less than significant. The increases in motor vehicle traffic noise under the SUMC Project were found to be a few tenths of a decibel at most along the identified roadways. Even with the slight (i.e., less than 0.1 decibel) traffic noise increase associated with new residential at the three housing sites, this alternative's noise impact would fall far short of the EIR significance thresholds; thus, traffic noise impacts would be less than significant under the Village Concept Alternative, like the SUMC Project. However, just as with the SUMC project, the relocation of the ED would establish a new ambulance route on Sand Hill Road with consequent significant and unavoidable noise impacts on the residential uses along Sand Hill Road between El Camino Real and Durand Way. The Sand Hill Road/ Pasteur Drive housing site is along an existing ambulance route. (S/SU)

- NO-1.4: Shield or Enclose HVAC Equipment and Emergency Generators

Cumulative Impacts. Cumulative noise impacts would be similar under this alternative and the SUMC Project. As with the SUMC Project, there would be significant cumulative construction noise with this alternative. Mitigation Measure NO-1.1 would be warranted but would not reduce the contribution if this alternative to less than considerable. This alternative would result in significant and unavoidable construction noise impacts. Also, there would be no significant cumulative vibration impacts with the SUMC Project as well as this alternative. No other foreseeable project would generate ambulance noise and so there would no cumulative impacts from ambulance noise. (S/SU)

Cultural Resources

Impacts on the Stone Building Complex. The Village Concept Alternative would demolish the same buildings at the Main SUMC Site as the SUMC Project, including the entire Stone Building complex, which is the only historic resource that would be demolished. Implementation of the mitigation measures proposed for the SUMC Project, also listed below, would reduce some of the cultural resources impacts resulting from demolition of the Stone Building complex; however the loss of the Stone Building complex would remain significant and unavoidable. (S/SU)

- CR-1.2: Prepare HABS Documentation for the Stone Building complex
- CR-1.3: Distribute Written and Photographic Documentation to Agencies
- CR-1.4: Prepare Permanent Interpretive Displays/Signage/Plaques

Impacts on the Hoover Pavilion. As with the SUMC Project, the Village Concept Alternative would have potential construction vibration impacts that could damage the Hoover Pavilion. Although vibrations have the potential to cause damage to the Hoover Pavilion, the vibration would be below the vibration threshold level at 25 feet away. However, similar to the SUMC Project, the demolition of the small sheds and storage facilities approximately 20 feet from the historic Hoover Pavilion could cause significant damage. The following mitigation measures, also identified for the SUMC Project, would prohibit the use of equipment that could create potentially damaging vibration levels, reducing this impact to less than significant. (S/LTS)

- CR-1.1: Manually Demolish Structures at the Hoover Pavilion Site
- CR-1.5: Implement Protection Documents for the Hoover Pavilion

Impacts on Archaeological and Paleontological Resources, and Human Remains. As discussed in Section 3.8, Cultural Resources, the SUMC Project could have significant impacts on archaeological and paleontological resources, and human remains. The Village Concept Alternative would increase the potential for a significant impact on archaeological resources and human remains because this alternative would increase ground disturbance by providing more paved surfaces for bicycle and pedestrian paths near areas where such resources have been discovered. The Village Concept Alternative would have the same potential for impact on paleontological resources as the SUMC Project; the pedestrian enhancement would not involve 15-foot trenching that could disturb such resources. Mitigation such as Mitigation Measures CR-2.1, CR-3.1, and CR-4.1, involving consultations and protective measures, would reduce the impact to less than significant. (S/LTS)

- CR-2.1: Construction Staff Training and Consultation
- CR-3.1: Conduct Protocol and Procedures for Encountering Human Remains
- CR-4.1: Conduct Protocol and Procedures for Encountering Paleontological Resources

Cumulative Impacts. As discussed in Section 3.8, Cultural Resources, cumulative development would have a significant cumulative impact on archaeological and paleontological resources, and human remains. The contribution of the SUMC Project would be considerable. Since the Village Concept Alternative would increase the area to be disturbed, then the Village Concept Alternative would also have a cumulatively considerable contribution to cumulative impacts on archaeological and paleontological resources, and human remains. Measures such as Mitigation Measures CR-2.1, CR-3.1, and CR-4.1 would reduce the contribution to less than considerable.

As discussed in Section 3.8, Cultural Resources, cumulative development has had a pre-existing significant cumulative impact on other E.D. Stone structures in Palo Alto. Like the SUMC Project, the Village Concept Alternative would have a cumulatively considerable contribution to the cumulative impact by demolishing the Stone Building complex at the Main SUMC Site. Mitigation such as Mitigation Measures CR-1.2 through CR-1.5, involving documentation and protective measures, would reduce the impact on historic resources; however, the loss of the Stone Building complex would remain a cumulatively considerable contribution to the cumulative impact. (S/SU)

Biological Resources

Dedicating the housing at the three sites to SUMC employees, and constructing the housing within the City's recommended timeline, would have no implications on the analysis in the Stanford CP/GUP EIR and Sand Hill Road EIR. Nonetheless, PBS&J's biologist conducted a site visit to the three housing sites on January 14, 2009, to confirm that no new sensitive species have occupied the housing sites since preparation of the those previous EIRs. No special-status plant or wildlife species were observed during the survey of the Pasteur Drive/Sand Hill Road site or the two Quarry Road sites.

Special Status Plant or Wildlife Resources. The SUMC Project could have a significant impact on special status bats and Cooper's hawk. The Village Concept Alternative would implement the SUMC Project as proposed as well as enhance pedestrian linkages. As such, the Village Concept Alternative could also have a significant impact on special status bats and Cooper's hawk. Measures such as those in Mitigation Measures BR-1.1 through BR-1.5, involving protective measures for bats and Cooper's hawk, would reduce the Village Concept Alternative's impact to a less-than-significant level. (S/LTS)

- BR-1.1: Pre-Demolition Survey
- BR-1.2: Avoidance
- BR-1.3: Special-Status Bats
- BR-1.4: Avoid Tree Removal During Nesting Season

Loss of Riparian or Other Sensitive Habitats. Similar to the SUMC Project, the Village Concept Alternative would have a less-than-significant impact on riparian habitats. While the Village Concept Alternative would enhance pedestrian linkages, those linkages involve relatively minor new permeable paths, road striping, signage, and canopies. Such enhancement would occur within a predominantly developed area and would be separated from the San Francisquito Creek by Sand Hill Road. It is unlikely that the enhancements would result in surface runoff or sedimentation from construction that would reach the creek in a substantial enough quantity to affect riparian vegetation, or cause significant fill of the channel within San Francisquito Creek. Additionally, mitigation measures and BMPs detailed in Section 3.11, Hydrology, would further reduce the potential for loss of riparian or wetland habitats due to sedimentation and erosion. Therefore, the Village Concept Alternative would have a less-than-significant impact on the riparian habitat of San Francisquito Creek. (LTS)

Interference with Species Movement, Wildlife Corridors, or Nursery Sites. Similar to the SUMC Project, the Village Concept Alternative would require the removal of trees and modifications to existing structures, which could be used by migratory birds as nursery sites including birds that nest on buildings (i.e., swallows, phoebes, etc.). The pedestrian linkages could remove shrubbery where birds may nest. Thus, like the SUMC Project, the Village Concept Alternative could result in a significant impact to migratory bird nests. Measures such as Mitigation Measures BR-3.1 and BR-3.2, involving protective measures, would reduce the impact to less than significant. (S/LTS)

- BR-3.1: Avoid Tree Removals or Building Demolition During Nesting Season
- BR-3.2: Protect Birds in the Event of Nest Discovery

Impacts on Protected Trees. While the pedestrian enhancements would not affect Protected Trees, the Village Concept Alternative would have the same impact on Protected Trees as the SUMC Project. As described in Section 3.9, Biological Resources, the SUMC Project would result in the removal of up to 71 Protected Trees, which would also apply to the Village Concept Alternative. The Hospital District would create a procedure to permit the removal of approximately 48 Protected Trees while attempting to preserve approximately 23 Protected Trees that are considered both biologically and aesthetically significant. Trees that are determined not to possess these two characteristics would be candidates for an exemption to the Tree Ordinance, and required replacement according to the City Tree Technical Manual (TTM) standards. Although the new Hospital District regulations would seek to avoid the removal of 23 Protected Trees that are both biologically and aesthetically significant at the SUMC Sites, 48 Protected Trees could still be removed as a result of the SUMC Project. In addition, as discussed in Section 3.9, not all of the biologically and aesthetically significant Protected Trees would be retained or relocated. As such, even with the implementation of the mitigation measures below, which would serve to protect the trees to be retained and relocated, the Village Concept Alternative, like the SUMC Project, would result in significant and unavoidable impacts to Protected Trees. (S/SU)

- BR-4.1: Prepare a Tree Preservation Report for all Trees to be Retained
- BR-4.2: Prepare a Solar Access Study (SAS) of Short and Long Term Effects on Protected Oaks
- BR-4.3: Prepare a Tree Relocation Feasibility Plan for Any Protected Tree Proposed for Relocation and Retention
- BR-4.4: Provide a Tree Preservation Bond/Security Guarantee
- BR-4.5: Provide Optimum Tree Replacement for Loss of Publicly-Owned Trees Regulated Tree Category

Conflicts with an HCP or NCCP. The Santa Clara Valley HCP is the nearest adopted HCP/NCCP in the region, but the SUMC Sites are not included within its boundaries. The Stanford University HCP is currently in public review and has not been adopted. As such, similar to the SUMC Project, the Village Concept Alternative would have no impact on an applicable HCP or natural communities conservation plan. (NI)

Cumulative Impacts. Cumulative development could negatively impact special-status bats, Cooper's hawk, and migratory birds, thus resulting in a significant cumulative impact on these resources. The contribution of the Village Concept Alternative to the cumulative impact would be the same as that of the SUMC Project. That is, Village Concept Alternative's contribution to the regional loss of urban habitat for special-status bats and Cooper's hawk would be less than cumulatively considerable since habitat disturbance would be similar to the SUMC Project.

Cumulative development within Palo Alto would have significant cumulative impacts on Protected Trees. Similar to the SUMC Project, even with implementation of Mitigation Measures BR-4.1 through BR-4.5, the contribution of the Village Concept Alternative to the cumulative loss of Protected Trees would be cumulatively considerable due to the amount of Protected Trees that would be removed under this alternative. (S/SU)

Geology, Soils, and Seismicity

Dedicating the housing at the three sites to SUMC employees, and constructing the housing within the City's recommended timeline, would have no implications on the analysis in the Stanford CP/GUP EIR and Sand Hill Road EIR.

Exposure to Seismic-Related Hazards. The SUMC Project would have a less-than-significant impact in regards to exposure of people or structures to substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground-shaking, seismic-related ground failure (including liquefaction), landslides, or expansive soil. Similar to the SUMC Project, the Village Concept Alternative would include the construction of new hospital buildings, clinical/medical offices, and above- and below-ground parking structures in the same locations as the SUMC Project. Consequently, the hospital portion of the Village Concept Alternative would be required to meet the heightened safety standards of OSHPD 1, including the seismic requirements of HFSSA as amended by SB 1953. Implementation of these standards and criteria would minimize the risk of loss, injury, or death from seismic events through the requirement that the hospital building remain standing and be operational following a major earthquake. The design of the non-hospital portion of the Village Concept Alternative would be required to meet the standards contained in the then-current CBC. In addition, the new pedestrian linkages under the Village Concept Alternative would not include new structures that would have a potential to be affected by seismic-related hazards. Because the newly constructed and retrofitted buildings under the Village Concept Alternative would be required to conform to current applicable OSHPD or City Building Code standards, they would not create any significant seismic hazards, soil instability hazards, or other hazardous geotechnical conditions, resulting in a less-than-significant impact. (LTS)

Exposure to Other Geotechnical Hazards. The SUMC Project would have a less-than-significant impact regarding the potential to be located on a geologic units or on soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. As with the SUMC Project, the Village Concept Alternative would have the same less-than-significant geotechnical hazards impacts. The regulatory environment providing protection from ground failures such as landslide (trench wall instability), lateral spreading (trench wall instability), subsidence, liquefaction, or collapse would be enforced by the City for the non-hospital buildings and by OSHPD for hospital buildings. In addition, the pedestrian enhancements would be constructed in areas that are predominantly developed and would not contribute to geotechnical hazards. With oversight responsibility vested in OSHPD for the hospital buildings and in the City for the non-hospital buildings, there would be a very low probability that any design feature approved by either agency would have other than a less-than-significant potential to expose people or property to on- or off-site landslide, lateral spreading, subsidence, liquefaction, or soil collapse. (LTS)

Cause Substantial Erosion or Siltation. The SUMC Project would have a less-than-significant potential to cause substantial erosion or siltation. The Village Concept Alternative would involve construction activities identical to those that would be involved in the SUMC Project, including demolition of structures and surface parking; excavation and trenching for foundations, underground garages, and utilities; soil compaction and site grading; and the erection of new structures, all of which would disturb soils temporarily. The Village Concept Alternative would be required to comply with the same City and State regulations as the SUMC Project. While the Village Concept Alternative would enhance pedestrian linkages, those linkages involve relatively minor new permeable paths, road striping, signage, and canopies. Such enhancement would occur within a predominantly developed area and would be separated from the San Francisquito Creek by Sand Hill Road, resulting in no increase in erosion or siltation. With oversight responsibility vested in OSHPD for the hospital buildings and in the City for the non-hospital buildings and other construction areas, there would be a very low probability that any design feature approved by either agency would have other than a less-than-significant potential to expose people, property, or downstream water courses to erosion and siltation hazards. (LTS)

Cumulative Impacts. Soil and geologic conditions are site-specific and there is little, if any, cumulative relationship between the SUMC Sites and other areas in the City. As such, the potential for cumulative impacts to occur is geographically limited for many geology and soils impact analyses. Cumulative development with the Village Concept Alternative would have approximately the same less-than-significant potential as with the SUMC Project to cause cumulatively substantial erosion or siltation. Construction and operational activities embodied in the Village Concept Alternative would be subject to the same regulation as the SUMC Project. Consequently, cumulative impacts would be less than significant. (LTS)

Hydrology

Dedicating the housing at the three sites to SUMC employees, and constructing the housing within the City's recommended timeline, would have no implications on the analysis in the Stanford CP/GUP EIR and Sand Hill Road EIR.

Flood Risks and Flood Flows. The SUMC Sites and pedestrian linkages are not in a 100-year flood hazard area and therefore, as with the SUMC Project, there would be no impact from Village Concept Alternative regarding flood hazards and flood flows. (NI)

Groundwater Recharge and Local Water Table. As with the SUMC Project, no new groundwater supply wells would be implemented under Village Concept Alternative. The new Welch Road/Pasteur Drive parking structure would be underground and portions of other structures may be partially underground. Therefore, temporary groundwater dewatering may be required during construction. As with the SUMC Project, the Village Concept Alternative impact on direct lowering of the water table level would be less than significant.

However, unlike the SUMC Project, Village Concept Alternative would slightly increase the overall site impervious surfaces by constructing paved pedestrian linkages, thereby reducing the potential for long-term groundwater recharge. As explained in Section 3.11, Hydrology, the SUMC Sites are not in a significant groundwater recharge area and a confining layer separates the surface water table groundwater from the deep groundwater aquifer in the vicinity. Consequently, although Village

Concept Alternative could very slightly reduce the potential for groundwater recharge compared to the existing conditions and to the SUMC Project, the potential would be a less-than-significant operational impact on groundwater recharge. (LTS)

Groundwater Quality. As for the SUMC Project, Village Concept Alternative construction activities could alter pollutant plume hydrology and plume movement at the Hoover Pavilion Site. As with the SUMC Project, existing regulations would prevent the introduction of construction pollutants into infiltrating water during construction and impacts on pollutant plume hydrology would be less than significant.

However, similar to the SUMC Project, the Village Concept Alternative's exposure of potentially unknown contaminated soil to rainfall runoff or runon during construction could allow for infiltrating water to pick up pollutants and carry them to underlying groundwater. The following mitigation measure, as identified for the SUMC Project, would reduce the Village Concept Alternative's impact on groundwater quality to a less-than-significant level. (S/LTS)

- HW-3.1: Develop Workplan for any Unknown Contaminated Sites

Stormwater Runoff and Erosion and Streambank Instability. As with the SUMC Project, compliance with existing regulations would prevent substantial on-site erosion and off-site sediment transport from implementation of the Village Concept Alternative. Therefore, similar to the SUMC Project, Village Concept Alternative impacts on on-site erosion and off-site sediment transport would be less than significant.

The SUMC Project would slightly reduce the amount of total impervious surfaces over existing conditions. However, due to the additional paved pedestrian linkages and paths, as proposed under the Village Concept Alternative, this alternative could have more impervious surfaces than the SUMC Project and existing conditions, and therefore, slightly higher stormwater runoff rates. The Study Area is in an area exempt from HM controls. Consequently, because San Francisquito Creek is sediment-impaired, impacts could be significant, unlike under the SUMC Project. If the Village Concept Alternative is found to have more impervious surfaces than the SUMC Project, then the following mitigation measure would apply. This mitigation measure, which is not identified for the SUMC Project, would reduce the potential Village Concept Alternative impacts on off-site erosion to less-than-significant levels. (S/LTS)

- *No Net Increase in Runoff.* Prior to receiving a grading or building permit, the SUMC Project sponsors shall develop and implement a Final Site Plan that does not increase the amount of post construction stormwater runoff from the SUMC Site.

Flooding and Stormwater Conveyance Capacity. As mentioned above, unlike the SUMC Project, the Village Concept Alternative could slightly increase the amount of impervious surfaces due to the construction of the pedestrian linkages. The paved paths could contribute to a minor increase in stormwater runoff to the storm drain system. However, the Village Concept Alternative's effect on flood event stormwater runoff would not be substantially different than the SUMC Project, which would be less than significant. Consequently, this would not substantially alter flood flows or stormwater conveyance capacities and Village Concept Alternative's impact on flooding and stormwater conveyance would be less than significant. (LTS)

Degradation of Surface Water Quality. Like the SUMC Project, existing regulations would prevent substantial transport of pollutants in stormwater runoff or to the sewer system by the Village Concept Alternative. Additionally, like the SUMC Project, the Village Concept Alternative may replace more than 50 percent of the SUMC Sites' impervious surfaces and therefore, the Village Concept Alternative would be required to implement post-construction stormwater quality BMPs to treat entire SUMC Sites' runoff. Although there is a slightly higher potential for stormwater runoff rates that could degrade surface water quality from implementation of Village Concept Alternative (due to the pedestrian linkages) as compared to the SUMC Project, the Village Concept Alternative would still have less-than-significant impacts on degradation of surface water quality. (LTS)

Dam Failure Inundation. The Village Concept Alternative would increase the exposure of people to dam failure inundation compared to existing conditions, but would not increase the number of people exposed to risk compared to the SUMC Project. Therefore, impacts associated with dam failure inundation would be less than significant. (LTS)

Violation of Any Water Quality Standards or Waste Discharge Requirements (WDRs). The Village Concept Alternative WDRs and water quality standards would be the same as for the SUMC Project. Similar to SUMC Project, existing City regulations, permitting process, and construction inspection ensures that WDRs and water quality standards would not be violated. Consequently, as with the SUMC Project, Village Concept Alternative impacts regarding violation of water quality standards or WDRs would be less than significant. (LTS)

Cumulative Impacts. As discussed in Section 3.11, Hydrology, cumulative impacts associated with current and future growth and development within the San Francisquito Creek watershed, surface runoff and erosion, flooding and stormwater conveyance capacity, streambank instability, degradation of surface water and groundwater quality, dam inundation, and violation of water quality standards and WDRs would be less than significant. Cumulative impacts within the Santa Clara Valley Groundwater Subbasin, on groundwater recharge, and on the local water table would be less than significant with existing regulations and management. (LTS)

Hazardous Materials

Dedicating the housing at the three sites to SUMC employees, and constructing the housing within the City's recommended timeline, would have no implications on the analysis in the Stanford CP/GUP EIR and Sand Hill Road EIR. Nonetheless, PBS&J reviewed a 2007 Environmental Data Resources, Inc. (EDR) report,[92] a database search for contaminated sites within an approximately two-mile radius of the Stanford Shopping Center, to confirm that no new soils contamination has occurred on the three housing sites since preparation of the those previous EIRs. Per the EDR report, no contamination has occurred on the three housing sites.

92 Environmental Data Resources, Inc, Database Search Inquire # 2059906.1s, October 24, 2004.

Exposure to Hazardous Materials During Construction. The construction of the pedestrian linkages under the Village Concept Alternative would not have a potential to expose hazardous materials during construction because they would not involve the demolition of existing buildings. For the SUMC component, the Village Concept Alternative would demolish the same amount of floor space and construct the same amount of square feet of new buildings as under the SUMC Project. Construction, demolition, and renovation associated with the Village Concept Alternative could expose construction workers and the community to potential toxic contaminants associated with building materials, such as ACM. Additionally, building components containing PCBs, lead, and/or mercury could also be found in the buildings proposed to be demolished under this alternative. Exposure to these materials during demolition, construction, and renovation activities is considered a potentially significant impact, similar to the SUMC Project. However, adherence to all applicable health and safety requirements for these substances, along with the following mitigation measure as proposed for the SUMC Project, would ensure that potential exposure impacts are less than significant, similar to the SUMC Project. (S/LTS)

- HM-2.1: Conduct Asbestos Survey at the SUMC Sites

As part of the proposed demolition, the Village Concept Alternative would demolish approximately 79,800 square feet of buildings at 701 and 703 Welch Road. Environmental assessments have been completed for these sites, which describe the historic uses and evaluate the current conditions at each location (as described in the analysis for the SUMC Project). The Phase I Assessment completed for 701 Welch in June 2006 concluded no major evidence of hazardous materials accidents or spills, and, therefore, did not recommend further soil and/or groundwater testing.

The Phase I Assessment for 703 Welch Road recommended a Phase II ESA to further investigate the soil and wastewater quality. The Phase II ESA concluded that the soil quality within a limited area of approximately 4 feet by 9 feet near four discharge points at the building had been affected by contaminated discharge of wastewater (from the amalgam separators) and recommended the discontinued practice of discharging wastewater from the amalgam separators into the landscape or garden. Such discharge activities have since been discontinued consistent with this recommendation.

Similar to the SUMC Project, the Village Concept Alternative would entail demolition and excavation at potentially contaminated sites (from known soil and groundwater contamination as described above). Therefore, impacts on construction personnel and the public due to exposure to contaminated soil/and or groundwater during construction activities are consider significant. Implementation of the following mitigation measures, as identified for the SUMC Project, would reduce the impacts to less than significant with respect to exposure of construction workers and the community to contaminated soil and groundwater during construction. (S/LTS)

- HM-3.2: Excavate Contaminated Soil from the 703 Welch Site
- HM-3.3: Conduct a Soil Vapor Program at the Hoover Pavilion Site
- HM-3.4: Develop a Site Management Plan for the Hoover Pavilion Site

Exposure to Hazardous Materials During Operation. Similar to the SUMC Project, the new hospital buildings under the Village Concept Alternative would include hazardous materials (such as flammable gas, oxidizers, and corrosive materials) and biohazardous materials (such as microorganisms, bacteria, and viruses) as part of their operation activities. All uses, handling, and disposal of hazardous materials are highly regulated under existing federal, State, and local regulations. As such, compliance with all regulations would ensure that impacts associated with exposure to hazardous materials during operation activities under the Village Concept Alternative would remain less than significant, as with the SUMC Project. In addition, operation of the pedestrian linkages would not result in increased exposure to hazardous materials. (LTS)

Safety Hazards to Schools. Like the SUMC Project, this alternative would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. No existing K-12 schools are located within one-quarter mile of the location of the Village Concept Alternative.

However, the LPCH includes an on-site school within the facility. As with the SUMC Project, the Village Concept Alternative would demolish and construct new buildings, and as such, could have the potential of increasing the amount of hazardous materials used on-site. Similar to the SUMC Project, the Village Concept Alternative would be subject to regulation and operation practices that minimize hazard risks and would ensure that associated risks are not substantially increased. Consequently, impacts associated with hazardous materials exposure within one-quarter mile of an existing or proposed school, including the on-site school locate within the LPCH facility, would be less than significant. (LTS)

Wildfire Risk. Similar to the SUMC Project, construction activities related to the Village Concept Alternative would occur outside the fire hazard zone, as identified in the City of Palo Alto Emergency Operations Plan.[93] Therefore, this alternative would not have an impact with regard to wildfire risk. No impacts would occur. (NI)

Safety Hazard from Public Airports. Similar to the SUMC Project, the Village Concept Alternative would not be located within the jurisdiction of any ALUP or within 2 miles of a public airport. Therefore, it would not expose worker and/or residents to a safety hazard from a public airport. As such, no impacts would occur. (NI)

Emergency Response or Evacuation Plans. The demolition and construction phase of the Village Concept Alternative would involve construction worker trips and the movement of construction trucks and heavy equipment, as under the SUMC Project. The Village Concept Alternative would use the same construction truck routes as the SUMC Project, many of which are identified as primary evacuation routes in the EOP and the Comprehensive Plan. As such, construction traffic would interfere within emergency access along these routes, resulting in a significant impact. In addition, the Village Concept Alternative would slightly increase the SUMC Project's construction-period impacts by constructing additional pedestrian amenities and linkage in the surrounding roadways. Like the SUMC Project, the Village Concept Alternative would upgrade utility infrastructure; therefore, road closures would occur under this alternative, resulting in a significant impact.

93 City of Palo Alto, Emergency Operations Plan, June 2007.

The Village Concept Alternative would also increase operational on-site activity compared to existing conditions, resulting in an increase in vehicular travel within the City. As explained in the Transportation analysis for the Village Concept Alternative, this alternative would have one more significant intersection LOS impact compared to the SUMC Project. Similar to the SUMC Project, due to additional traffic congestion at these intersections, travel time by emergency vehicles would increase, resulting in a significant impact. The below mitigation measures, as outlined for the SUMC Project, would reduce the impacts to emergency response and evacuation plans during construction and operation to less than significant. (S/LTS)

- HM-10.1: Coordinate Construction Activities with the City of Palo Alto
- TR-1.1: Provide Off-Street Parking for Construction Related Vehicles
- TR-1.4: Restrict Construction Hours
- TR-1.5: Restrict Construction Truck Routes
- TR-1.6: Protect Public Roadways During Construction
- TR-1.8: Prepare and Implement Construction Impact Mitigation Plan
- TR-9.1: Pay Fair Share Towards OptiCom Installation

Cumulative Impacts. As discussed in Section 3.12, Hazardous Materials, cumulative development would increase the use, storage, and handling of hazardous materials within the SUMC Sites and surrounding areas and also could increase risk of exposure at schools within a quarter mile of the SUMC Sites. However, these activities would be subject to laws and regulations pertaining to the handling, storage, and disposal of hazardous materials as described in Section 3.12. As such, cumulative impacts related to hazardous materials use, storage, and handling would be less than significant under both this alternative and the SUMC Project. With both the SUMC Project and this alternative, there would be no cumulative impacts related to construction of schools on contaminated property, hazards from wildland fires, or airport operations.

During demolition and excavation activities, this alternative could expose workers to contaminants associated with building materials, such as asbestos, and could also disturb contaminated soils. The exposure would primarily be from construction activities within the SUMC Sites; construction of the bicycle and pedestrian linkages would result in minimal to no potential for hazards due to the minimal ground disturbance involved. The 777 Welch Road project, almost adjacent to the Main SUMC Site, would also potentially release contaminants associated with building materials, and potentially disturb previously contaminated soils, which are known to occur in the areas adjacent to the SUMC Sites. That project and this alternative could result in significant cumulative impacts. The contribution of the Village Concept Alternative would be considerable given the extent of construction involved on the SUMC Sites. Mitigation Measure HM-2.1 would involve measures to reduce exposure of persons to hazardous materials (such as asbestos). Mitigation Measures HM-3.1 through and HM-3.4, would involve investigations at other SUMC areas, remediation, and preparation of the Site Management Plan for remediation activities. These mitigation measures, expanded throughout the Village Concept Study Area, would reduce the Village Concept Alternative's contribution to a less than cumulatively considerable level.

Construction of reasonably foreseeable projects within the City could involve increased intersection delays, resulting in significant cumulative construction-period impacts on emergency access. The Village Concept Alternative's contribution to the cumulative impact on emergency response and evacuation plans would be cumulatively considerable. However, Mitigation Measures HM-10.1, TR-1.1, TR-1.4 through TR-1.6, and TR-1.8, would reduce the Village Concept Alternative's contribution to cumulative impacts on emergency evacuation and response plans to less than cumulatively considerable. (S/LTS)

Population and Housing

Dedicating the housing at the three sites to SUMC employees, and constructing the housing within the City's recommended timeline, would have no implications on the analysis in the Stanford CP/GUP EIR and Sand Hill Road EIR.

Population Increases. The Village Concept Alternative would result in a similar increase in direct employment and visitorship, and the indirect demand for housing, as the SUMC Project. Like the SUMC Project, this alternative would not directly add new residents into the City (construction of the 70 housing units at Pasteur Drive and Sand Hill Road have been proposed and approved separately, as part of the Sand Hill Road Corridor Projects). Indirect population increases from this alternative would represent a small portion of the population projected by ABAG within the City of Palo Alto's sphere of influence and Bay Area region, and would therefore be less than significant. (LTS)

Displacement of Housing. Similar to the SUMC Project, this alternative would have no impact on the displacement of existing housing. (NI)

Jobs to Employed Residents Ratio. As discussed in Section 3.13, Population and Housing, the jobs to employed residents ratio impact is not, by itself, considered an environmental impact; however, it is analyzed because this impact would result in secondary environmental impacts on air quality and climate change. Specifically, as with the SUMC Project, the Village Concept Alternative's impact on the jobs to employed residents ratio would result in increased commute traffic, which is a significant contributor to this alternative's significant and unavoidable impacts on air quality and climate change. As such, the analysis below identifies additional mitigation measures relating to the jobs to employed residents ratio, with additional measures the City can consider as a means for further mitigating those significant environmental impacts identified for air quality and climate change.

The City's currently projected jobs to employed residents ratio in 2025 is approximately 2.61 (without the SUMC Project). Adding the SUMC Project's 2,242 new employees to the ratio of 2.61 jobs to employed residents within the City,[94] the SUMC Project would increase the 2025 ratio by approximately 0.05, resulting in a 2025 ratio of about 2.66 jobs per employed resident.[95] This is a significant impact under the City's significance criteria.

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94 112,560 jobs to 43,160 employed residents within the City = 2.61

95 112,560 jobs in 2025 + 2,242 jobs under the SUMC Project = 114,802 jobs/43,160 employed residents within the City = 2.66

The Village Concept Alternative would result in the same increase in employment as the SUMC Project. The pedestrian linkages would not add employment (other than potential temporary construction employment). Dedication of the 490 housing units to SUMC Project employees would reduce criteria pollutant and greenhouse gas emissions (associated with VMT) from the SUMC Project, as explained under Air Quality and Climate Change. However, in terms of the jobs to employed residents ratio, the Village Concept Alternative would have the same impact as the SUMC Project. The Quarry Road housing sites are on Santa Clara County land, and would thus not contribute to the jobs to employed residents ratio of the City of Palo Alto. Also, the currently projected 2025 ratio of 2.61 is based on ABAG Projections 2005.

The Sand Hill Road Corridor Projects were approved in the late 1990s, several years before the release of ABAG Projections 2005, on which the jobs to employed residents ratio is based. As such, it is reasonable to assume that the housing at the Pasteur Drive/Sand Hill Road site was already included in ABAG Projections 2005 as well as the 2.61 jobs to employed residents ratio. In this case, dedication of the 70 units at this site would not affect the SUMC Projects impact on the jobs to employed residents ratio. Assuming that the 70 units at the Pasteur Drive/Sand Hill Road site were not included in ABAG 2005 Projections, this alternative would result in a slightly smaller impact to the jobs to employed residents ratio than the SUMC Project. The currently projected jobs to employed residents ratio in 2025 (which is the year that the Village Concept Alternative would reach its full buildout) is approximately 2.61 (without this alternative). The 70 units on Pasteur Drive, if occupied by SUMC employees, would yield 120 employed residents to Palo Alto.[96] Adding the 120 employed residents per household to the ratio of 2.61 jobs to employed residents within the City in 2025, the housing component of the Village Concept Alternative would decrease the ratio by approximately 0.007.[97] When factoring in the SUMC Project component of the Village Concept Alternative, this alternative would increase the ratio by approximately 0.04. This calculation is shown in Table 5-17. In comparison, the SUMC Project alone (without housing) would increase the ratio by 0.05 (see Section 3.13, Population and Housing). Nonetheless, like the SUMC Project, this alternative would increase the City's jobs to employed residents ratio by over 0.01.

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[96] 1.72 workers/worker households x 70 housing units at the Pasteur/Sand Hill site = 120 additional employed residents in 2025.

[97] 2.6007393 (jobs to employed residents ratio in 2025 with the Village Concept Alternative) – 2.6079703 (projected jobs to employed residents ratio in 2025 without the Village Concept Alternative) = -0.007

Table 5-17
Village Concept Alternative Impact on City of Palo Alto Jobs to Employed Residents Ratio

Projections 2025 Without Village Concept Alternative	
Number of Projected Jobs in the City of Palo Alto in 2025	112,560
Number of Projected Employed Residents in 2025	43,160
Projected Jobs to Employed Residents Ratio in 2025	2.6079703
Projections 2025 With Village Concept Alternative	
Number of Projected Employed Residents in 2025[a]	43,280
Jobs to Employed Residents Ratio in 2025	2.6007393
Village Concept Alternative Total Net Employment[b]	2,242
Number of Jobs to Increase the Jobs/Employed Residents Ratio More than 0.01[c]	433
Number of Jobs Generated by Reduced Intensity Alternative B Above and Over the 0.01 Ratio[d]	1,809
Resulting jobs to housing ratio with the SUMC Project[e]	2.6526645

Sources: ABAG 2005; KMA, 2009; Census 2000; City of Palo Alto, 2010.

Notes:

a. 1.72 workers/worker households x 70 housing units at the Pasteur/Sand Hill site = 120. 120 + 43,160 = 43,280 employed residents

b. Adjusted for part-time.

c. 2.6007393 (2025 jobs/housing ratio) + 0.01 x 43,280 (2025 employed residents) = 112,992.79. 112,992.79 jobs – 112,560 jobs (projected 2025 jobs within the City) = 432.79 = ~433 jobs

d. 2,242 (additional SUMC employees) – 433 (City threshold) = 1,809 jobs

e. 112,560 (2025 jobs) + 2,242 (additional SUMC employees) / 43,280 (2025 employed residents) = 2.6525415= ~2.65

Implementation of Mitigation Measure PH-3.1, as proposed for the SUMC Project, is not directly required in order to mitigate a significant environmental impact under the Tree Preservation Alternative. Instead, this mitigation measure shall be considered as possible additional mitigation for impacts identified under air quality and climate change. However, it should be noted that these measures are presented here only in conceptual terms, and the City may find that some or all of them are not feasible for various legal, practical, or other reasons. As such, this measure is presented for informational purposes, and to ensure that all possible options for mitigation of these impacts are adequately considered.

- PH-3.1: Reduce the Impacts on the Jobs to Employed Residents Ratio

Cumulative Impacts. ABAG Projections forecast the housing that would be built within each community up to 2025; therefore, the projections can be treated as cumulative housing development. As such, the cumulative analysis pertaining to indirect housing demand or increases in permanent (residential) population is already provided above. In addition, as with the SUMC Project, cumulative development with this alternative would not have cumulative impacts on the City's jobs to employed residents ratio. (LTS)

Public Services

Dedicating the housing at the three sites to SUMC employees, and constructing the housing within the City's recommended timeline, would have no implications on the analysis in the Stanford CP/GUP EIR and Sand Hill Road EIR.

Demand for Fire Services. Like the SUMC Project, the Village Concept Alternative would require an increased level of fire services due to increased employment and on-site activity. With more on-site activity there could be more incidents requiring fire department response. This alternative would involve the same amount of beds and employees as the SUMC Project; therefore, this alternative would require three additional full time staff and a new 100-foot ladder fire truck. However, the increased level of fire services would not be large enough to trigger the need for construction of new or expanded facilities that could adversely affect the physical environment or affect human health and safety. In addition, the pedestrian linkages under the Village Concept Alternative would not increase the need for fire services. Thus, the impact of the Village Concept Alternative regarding fire services would be less than significant, like the SUMC Project. (LTS)

Demand for Police Services. The Village Concept Alternative would require an increased level of police services due to increased employment and on-site activity. As with the SUMC Project, more on-site activity would likely result in additional traffic accidents and other incidents that police officers may be required to respond to. However, the increased level of demand for police services would not be large enough to trigger the need for construction of new or expanded facilities that could adversely affect the physical environment or affect human health and safety. In addition, installation and operation of pedestrian enhancements, as proposed under the Village Concept Alternative, would not demand additional police services. Therefore, like the SUMC Project, this alternative's impacts regarding police services would be less than significant. (LTS)

Demand for Schools. Similar to the SUMC Project, the Village Concept Alternative would not involve the construction of new residential units within the City that have not previously been environmentally cleared Nonetheless, this alternative would indirectly generate students from induced housing caused by increased employment on the SUMC Sites. However, impacts from the indirectly generated students would be mitigated by payment of the school impact fees established by SB 50, resulting in less-than-significant impacts. In addition, the pedestrian linkages would not increase the demand for schools. (LTS)

Demand for Parks and Recreation. The Village Concept Alternative would result in an increased demand and utilization of nearby parks and recreational services due to increased employment and on-site activity on the SUMC Sites.[98] As with the SUMC Project, the Village Concept Alternative would be required to pay a "Community Facility Fee," which has a line item for parks that would fund

[98] DMG-Maximus, City of Palo Alto, Parks and Community Facilities Impact Fee Study, September 18, 2001.

acquisition of land and improvements for neighborhood and district parks.[99] Likewise, this alternative's contribution to the General Fund, through fees and taxes, would help finance the maintenance and upkeep of park and recreational facilities. Like the SUMC Project, payment of these fees and taxes would mitigate the Village Concept Alternative's impacts on City parks and recreational facilities to a less-than-significant level. In addition, the installation of pedestrian linkages to and from the SUMC Sites, the Stanford Shopping Center, the housing sites, PAITS and other surrounding areas would not increase the demand for new parks and recreational facilities. (LTS)

Cumulative Demand for Services. As discussed in Section 3.14, Public Services, cumulative impacts related to fire protection and parks and recreational demands would be less than significant. Because this alternative would involve a similar level of development compared to the SUMC Project, then cumulative impacts related to fire protection and parks would also be less than significant with this alternative. However, cumulative demand on police service and schools could necessitate construction of new or expanded facilities, which could result in significant impacts. As discussed in Section 3.14, Public Services, the SUMC Project's contribution to the cumulative need for these new facilities would be less than cumulatively considerable. Because this alternative would involve a similar level of development compared to the SUMC Project, then its contribution would also be less than considerable. The enhanced Bicycle and Pedestrian linkages would not contribute to cumulative demand for police and school facilities. (LTS)

Utilities

Dedicating the housing at the three sites to SUMC employees, and constructing the housing within the City's recommended timeline, would have no implications on the analysis in the Stanford CP/GUP EIR and Sand Hill Road EIR.

Water Demand. Like the SUMC Project, the Village Concept Alternative would have less-than-significant impacts related to water supply. During years of above-normal and normal water supply, the City has sufficient supplies to meet the demands of the Village Concept Alternative. During single and multiple dry years, City water supplies from SFPUC are insufficient to meet demands. These supply deficiencies can be met with the implementation of the WSIP, EWSS projects, and dry year demand reductions in accordance with the WSCP. The City's WSCP would be implemented in progressive stages, as needed to achieve a positive balance of supplies and demands during drought years.

This alternative involves the same amount of development at the SUMC Sites as the SUMC Project, including the same amount of beds and employees. In addition, the Village Concept Alternative would construct pedestrian linkages; however, these would not increase the water demand. Therefore, this alternative would not require the City to create new or expanded entitlements for water supplies. Also, Stanford has indentified a long list of conservation measures that it proposes to implement to help

[99] City of Palo Alto, *Municipal Codes*, *Section 16.58, Building Regulations,* http://nt2.scbbs.com/cgi-bin/om_isapi.dll?clientID=277797042&infobase=procode-3&softpage=Browse_Frame_Pg, accessed, January 14, 2008.

reduce the water demands of the SUMC Project (which would apply to the SUMC component of the Village Concept Alternative as well); these measures may be required as conditions of SUMC Project approval. Therefore, this alternative would result in less-than-significant impacts related to water demand. (LTS)

Wastewater Generation. As discussed in Section 3.15, Utilities, the SUMC Project would have less-than-significant impacts related to wastewater generation. The Village Concept Alternative would involve the same amount of water use (and associated wastewater generation) as the SUMC Project. In addition, the installation of new pedestrian connections would not increase wastewater generation. Therefore, this alternative would not require the expansion or installation of wastewater facilities. As with the SUMC Project, the Village Concept Alternative would not cause the existing wastewater facilities to experience substantial physical deterioration that would cause the need for their replacement. Therefore, the construction of the Village Concept Alternative would result in a less-than-significant impact related to wastewater generation and the deterioration of wastewater facilities. (LTS)

Stormwater Generation. As discussed in Section 3.15, Utilities, the SUMC Project would have less-than-significant impacts related to stormwater collection system capacity. As with the SUMC Project, the existing stormwater facilities that would serve the Village Concept Alternative have adequate capacity to convey the 6-hour 10-year storm event without flooding. Also, the SUMC component of the Village Concept Alternative would increase pervious area and thereby decrease runoff, similar to the SUMC Project. However, due to the construction of paved pedestrian linkages, the Village Concept Alternative would slightly increase the overall site impervious surfaces, thereby increasing the potential for runoff of stormwater. These pedestrian linkages would constitute relatively minor new permeable paths, road striping, signage, and canopies and would occur within a predominantly developed area, resulting in minor stormwater increases. Nonetheless, as explained under the Hydrology analysis, the Village Concept Alternative would have more impervious surfaces than the SUMC Project, and therefore, increased stormwater flow. The Hydrology analysis for this alternative identified a mitigation that would prohibit an increase in post-construction stormwater runoff. With this measure, impacts related to stormwater facilities would be less than significant.

If the Village Concept Alternative is found to have more impervious surfaces than the SUMC Project, then the following mitigation measure would apply. This mitigation measure, which is not identified for the SUMC Project, would reduce the potential Village Concept Alternative impacts related to stormwater facilities to less-than-significant levels. (S/LTS)

- *No Net Increase in Runoff.* Prior to receiving a grading or building permit, the SUMC Project sponsors shall develop and implement a Final Site Plan that does not increase the amount of post construction stormwater runoff from the SUMC Sites.

Solid Waste Generation. As discussed in Section 3.15, Utilities, the solid waste facilities that would serve the SUMC Sites have sufficient remaining capacity to accommodate the SUMC Project. Therefore, the solid waste facilities that would serve the SUMC Sites would be sufficient to accommodate the Village Concept Alternative and, thus, this alternative would not contribute to the need to expand existing or construct new solid waste disposal facilities. In addition, the new pedestrian linkages would not generate a new source of solid waste. Since the Village Concept Alternative would involve the same amount of development at the SUMC Sites as the SUMC Project and would not involve a greater amount of beds or employees, this alternative would result in less-than-significant impacts related to solid waste generation. (LTS)

Energy Demand. As discussed in Section 3.15, Utilities, the SUMC Project would have a less-than-significant impact on natural gas and electrical facilities. This alternative involves the same amount of development as the SUMC Project at the SUMC Sites, and would include the energy conservation measures that would apply to the new buildings under the SUMC Project. Overall, with this alternative, the demand on energy would increase from current conditions because of the increase in square footage and on-site activity at the SUMC. Like the SUMC Project, this increase would require the installation of additional feeder cables, which would occur within the same construction footprint as the SUMC Project and which are analyzed throughout this document. In addition, the pedestrian linkages component of the Village Concept Alternative could include the installation of lighting along the paved paths; however, the increase in energy use for these lights would be insignificant in comparison to the energy use in the rest of the City. Therefore, like the SUMC Project, the Village Concept Alternative would result in less-than-significant impacts as a result of the installation and rerouting of electrical lines. (LTS)

Cumulative Demand for Utilities. As discussed in Section 3.15, Utilities, cumulative impacts related to solid waste facilities would be less than significant because the SMART Station and Kirby Canyon Landfill would have adequate capacity to serve their service area in 2025.[100, 101] Similarly, cumulative impacts related to water supply facilities are less than significant because the City plans to implement its WSCP in progressive stages, as needed to achieve a positive balance of supplies and demands. Therefore, the City can supply for its projected demands without exceeding SFPUC projected allocations or the City's SFPUC ISG.[102] Likewise, the RWQCP has adequate capacity to serve its service area in 2025.[103]

Also, as discussed in the SUMC Project utilities analysis, the City's electricity, natural gas, and storm water drainage facilities have sufficient capacity to serve the cumulative development of the City in 2025. Future development in the City would generate an increased demand on utility facilities. This increase could require the maintenance and replacement of outdated and deteriorated wastewater facilities. The City has a Capital Improvement Program that provides replacements and maintenance

100 Debi Sargent, Solid Waste Contract Administrator, City of Sunnyvale, Public Works, electronic communication with PBS&J, November 10, 2008.

101 Guy Petraborg, Kirby Canyon Landfill, electronic communication with PBS&J, November 18, 2008.

102 City of Palo Alto, Water Supply Assessment for Stanford University Medical Center Facilities Renewal and Replacement Project and: Simon-Properties Shopping Center Expansion, December 2008.

103 Rick Wetzel, Manager, Water Quality Control Plant in the Public Works Department, City of Palo Alto, electronic communication with PBS&J, November 26, 2007.

for the City's utility facilities.[104] This program is funded by the rates charged by the City to customers for utility services. Any such replacements or maintenance under the Village Concept Alternative would comply with all applicable environmental regulations and would have a less than significant potential to contribute to a cumulative impact regarding utility facilities. (LTS)

Environmentally Superior SUMC Project Alternative

On the basis of comparing the extent to which the alternatives reduce or avoid the SUMC Project's significant impacts, No Project Alternative A would be the environmentally superior alternative. However, CEQA requires the selection of another alternative other than the No Project Alternative as the environmentally superior alternative (see CEQA Guidelines, Section 15126.6(e)(2)); therefore, neither No Project Alternative A nor No Project Alternative B can be selected as the environmentally superior alternative.

Reduced Intensity Alternative B, the Tree Preservation Alternative, the Historic Preservation Alternative, and the Village Concept Alternative have similar impacts to the SUMC Project. The Tree Preservation Alternative would avoid the significant and unavoidable NOx construction emissions of the SUMC Project and these other alternatives. Under the Historic Preservation Alternative, the impacts on the Stone Building complex can be mitigated to less than significant, whereas this impact would be significant and unavoidable under these other alternatives. However, Reduced Intensity Alternative A would more so avoid several of the significant and unavoidable impacts identified for the SUMC Project. Since Reduced Intensity Alternative A would increase floor area, but not the number of beds or employees, operations at the SUMC Sites would not increase. Unlike the SUMC Project, Reduced Intensity Alternative A would reduce the significant and unavoidable operational intersection and roadway segment impacts to nil. In addition, although Reduced Intensity Alternative A would result in significant and unavoidable construction criteria air pollution emissions like the SUMC Project, this alternative would avoid the significant and unavoidable criteria air pollution that would be emitted during operation of the SUMC Project. Reduced Intensity Alternative A would also avoid the impacts related to the deterioration of the City's jobs to employed residents ratio. Reduced Intensity Alternative A would also avoid the significant and unavoidable greenhouse gas emissions under the SUMC Project and these alternatives.

However, Reduced Intensity Alternative A would still result in several of the significant and unavoidable impacts identified for the SUMC Project, including emission of ambulance noise along a new emergency vehicle route; demolition of a portion of the 1959 Hospital Building complex; and the removal of several Protected Trees. Nonetheless, Reduced Intensity Alternative A would avoid more significant and unavoidable SUMC Project impacts than the other alternatives (besides the No Project Alternatives) and therefore is considered the environmentally superior alternative.

[104] City of Palo Alto, http://www.cityofpaloalto.org/civica/filebank/blobdload.asp?BlobID=3954, accessed November 24, 2008.

Section 6
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