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).

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.”

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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).

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

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. 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

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3 Shanthi Ganji, Assistant Transportation Engineer, SCVTA, personal communication with PBS&J, November 6, 2007.
focus its development efforts on the SUMC Project, 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. 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

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. 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. 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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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.