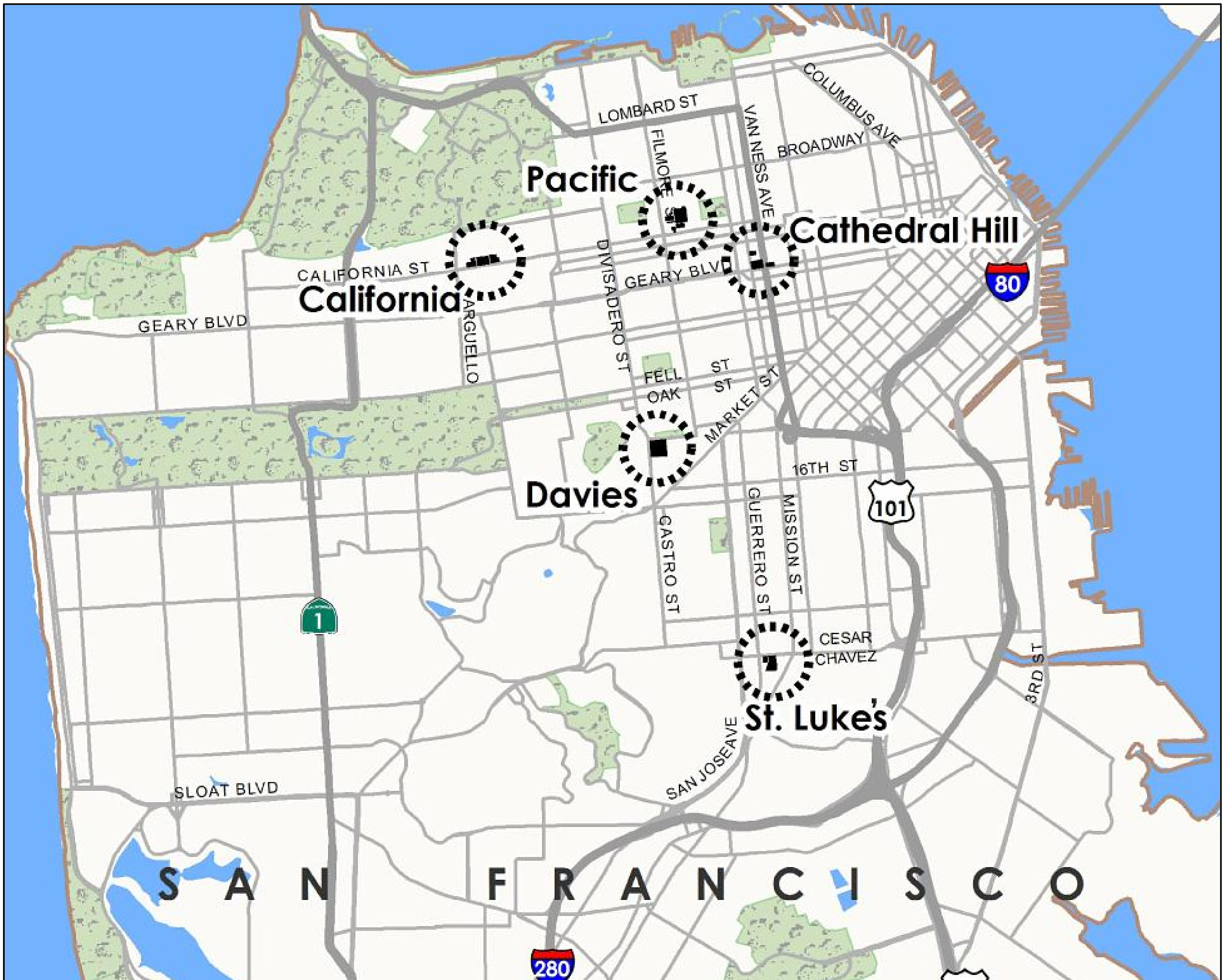

DRAFT ENVIRONMENTAL IMPACT REPORT

VOLUME 3

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California Pacific Medical Center (CPMC) Long Range Development Plan

PLANNING DEPARTMENT CASE NO. 2005.0555E
STATE CLEARINGHOUSE NO. 2006062157

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ACRONYMS AND ABBREVIATIONS

µg/m^3	micrograms per cubic meter
µin/sec	microinch(es) per second
ºC	degrees Celsius
ºF	degrees Fahrenheit
2000 CAP	*Bay Area 2000 Clean Air Plan*
2005 Bay Area Ozone Strategy	*2005 Ozone Strategy for the San Francisco Bay Area*
AB	Assembly Bill
AB 32	California Global Warming Solutions Act of 2006
ABAG	Association of Bay Area Governments
ACC	Ambulatory Care Center
ADMP	asbestos dust mitigation plan
ADRP	archaeological data recovery plan
ADT	average daily traffic
Alquist-Priolo Act	Alquist-Priolo Earthquake Fault Zoning Act
ALS	amyotrophic lateral sclerosis (Lou Gehrig's Disease)
Ambulances	emergency vehicle sirens
amsl	above mean sea level
ANSI	American National Standards Institute
APS	Alternative Planning Strategy
ARB	California Air Resources Board
ARDTP	archaeological research design and treatment plan
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
ATP	archaeological testing plan
BAAQMD	Bay Area Air Quality Management District
BART	Bay Area Rapid Transit
Basin Plan	*Water Quality Control Plan for the San Francisco Bay Basin*
Bay	San Francisco Bay
Better Streets Plan	*San Francisco Better Streets Plan*
BLIP	Branch Library Improvement Program
BMP	best management practice
B.P.	Before Present
BRT	Bus Rapid Transit

Btu	British thermal units
BWWF	Bayside Wet Weather Facilities
C&D	Construction and Demolition
CAA	Clean Air Act
CAAA	Clean Air Act Amendments of 1990
CAAQS	California ambient air quality standards
CAFE	corporate average fuel economy
Cal/EPA	California Environmental Protection Agency
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CAP	clean air plan
CBC	California Building Code
CBRNE	chemical, biological, radiological, nuclear, high-yield explosives equipment
CCAA	California Clean Air Act
CCAR	California Climate Action Registry
CCR	California Code of Regulations
CDHS	California Department of Health Care Services
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGS	California Geological Survey
CH_4	methane
CHP	California Highway Patrol
City	City and County of San Francisco
CIWMB	California Integrated Waste Management Board
Climate Action Plan	*Climate Action Plan for San Francisco: Local Actions to Reduce Greenhouse Gas Emissions*
CMP	Congestion Management Program
CMWMP	California Medical Waste Management Program
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNRA	California Natural Resources Agency
CO	carbon monoxide
CO_2	carbon dioxide

CO_2e	carbon dioxide–equivalent
CPMC	California Pacific Medical Center
CPT	cone penetration test
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CSO	combined sewer overflow
CSO Policy	Combined Sewer Overflow Control Policy
CU	conditional use
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
CZ	climate zone
dB	decibel(s)
dBA	A-weighted decibel(s)
dB/DD	decibels per doubling of distance (attenuation)
dbh	diameter at breast height
DBI	San Francisco Department of Building Inspection
DEIR	draft environmental impact report
DFG	California Department of Fish and Game
DOF	California Department of Finance
DOT	U.S. Department of Transportation
Downtown Basin	Downtown San Francisco groundwater basin
DPH	California Department of Public Health
DPH RHB	Radiological Health Branch of the California Department of Public Health
DPW	San Francisco Department of Public Works
DSHA	Deterministic seismic hazard analysis
DTSC	California Department of Toxic Substances Control
eb	eastbound
ECP	environmental contingency plan
EDR	Environmental Data Resources
EEA	environmental evaluation application
EEG	electroencephalography
EIR	environmental impact report
EISA	Energy and Independence Security Act of 2007
EMFAC2007	On-Road Mobile-Source Emission Factor model
EMS	emergency medical services

Endangerment Finding	*Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act*
EOP	Emergency Operations Plan
EPA	U.S. Environmental Protection Agency
EPCA	Energy Policy and Conservation Act
ERO	Environmental Review Officer
ESA	federal Endangered Species Act of 1973
ESA	Environmental Site Assessment
ºF	degrees Fahrenheit
FAR	floor area ratio
FARR	final archaeological resources report
FEIR	final environmental impact report
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FHWA RD 77-108	FHWA Traffic Noise Prediction Model
Findings	findings of fact
FR	*Federal Register*
FTA	Federal Transit Administration
FTE	full-time equivalent
General Plan	*San Francisco General Plan*
GGT	Golden Gate Transit
GHG	greenhouse gas
GP	General Plan
GVW	gross vehicle weight
GWh	gigawatt-hour(s)
GWP	Global Warming Potential
h	hourly
HAP	hazardous air pollutant
Harry Tracy WTP	Harry Tracy Water Treatment Plant
HAZWOPER	Hazardous Waste Operations and Emergency Response
HCM	*Highway Capacity Manual*
HFC	hydrofluorocarbons
HHWP	Hetch Hetchy Water and Power
HI	hazard index
HMBP	hazardous materials business plan

HMUPA	Hazardous Materials Unified Program Agency
HRA	health risk assessment
HVAC	heating, ventilation, and air conditioning
Hz	Hertz
I-	interstate highway
IBC	International Building Code
ICC	International Code Council
IHH	Institute for Health and Healing
IMP	institutional master plan
in/sec	inch(es) per second
ISCOTT	Interdepartmental Staff Committee on Traffic and Transportation
ITE	Institute of Transportation Engineers
kW	kilowatt
lb/day	pounds per day
lb/in	pounds per inch
LED	light-emitting diode
LEED®	Leadership in Energy and Environmental Design
L_{dn}	day-night average noise level
L_{eq}	equivalent noise energy level
$L_{eq(24)}$	equivalent noise energy level averaged over a 24-hour period
LID	Low Impact Development
L_{max}	maximum noise level
L_{min}	minimum noise level
Lobos Basin	Lobos groundwater basin
LOS	level of service
LRDP	*Long Range Development Plan*
LVW	loaded vehicle weight
L_v	root mean square velocity expressed in vibration decibels
L_x	noise level exceeded X% of a specific period of time
M	moment magnitude (scale for measuring seismic activity)
MBTA	Migratory Bird Treaty Act
MCE	maximum considered earthquake
MEA	Major Environmental Analysis Division (of the San Francisco Planning Department)
mg/m^3	milligrams per cubic meter
mgd	million gallons per day

MLD	Most Likely Descendant
MLP	maximum load point
MMI	Modified Mercalli Intensity (scale of earthquake intensity)
MMRP	mitigation monitoring and reporting plan
MMT	million metric tons
MMTCO2E	million gross metric tons of CO_2e
MOB	Medical Office Building
mpg	miles per gallon
mph	miles per hour
MPO	metropolitan planning organization
MRI	magnetic resonance imaging
MRZ-	Mineral Resource Zone
MS4	municipal separate storm sewer system
MT	metric tons
MT/yr	metric tons per year
MTS	Metropolitan Transportation System
MUN	Municipal and Domestic Supply
Muni	San Francisco Municipal Railway
MY	model year
MW	megawatt(s)
N_2O	nitrous oxide
NAAQS	national ambient air quality standards
NAHC	Native American Heritage Commission
nb	northbound
NC-3	Neighborhood Commercial District, Moderate-Scale
NCD	Neighborhood Commercial District
NFIP	National Flood Insurance Program
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NO	nitric oxide
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NOP	notice of preparation
NO_X	oxides of nitrogen
NFIP	National Flood Insurance Program

NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWS	National Weather Service
NWIC	Northwest Information Center
OAP	ozone attainment plan
OFFROAD2007	Off-Road Mobile-Source Emission Factor model
OHP	California Office of Historic Preservation
OPR	Governor's Office of Planning and Research
OPR	Outpatient/Research Building
OSHA	U.S. Occupational Safety and Health Administration
OSHPD	Office of Statewide Health Planning and Development
PCB	polychlorinated biphenyl
PCE	passenger car equivalent
PEIR	program EIR
Permanent	no fixed
PFC	perfluorocarbons
PG&E	Pacific Gas and Electric Company
PHSH	U.S. Public Health Service Hospital
Planning Code	San Francisco Planning Code
$PM_{2.5}$	fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less
PM_{10}	respirable particulate matter with an aerodynamic diameter of 10 micrometers or less
ppm	parts per million
Port	Port of San Francisco
PPV	peak particle velocity
PRC	Public Resources Code
PSHA	Probabilistic seismic hazard analysis
PUD	Planned Unit Development
R	residential
RC-4	Residential-Commercial Combined Districts, High Density
RCRA	Resource Conservation and Recovery Act
REC	recognized environmental conditions
RH-1	Residential, House, One-Family
RH-1D	One Unit per Lot, Detached
RH-2	Residential, House Districts, Two-Family
RH-3	Residential, House Districts, Three-Family

RHB	Radiological Health Branch of the California Department of Public Health
RM-1	Residential, Mixed Districts, Low Density
RM-2	Residential, Mixed Districts, Moderate Density
RM-4	Residential, Mixed Districts, High Density
RMS	root mean square
ROG	reactive organic gases
ROWD	report of waste discharge
RPP	Residential Permit Parking
RTP	Regional Transportation Plan
RWQCB	regional water quality control board
RWMP	*Recycled Water Master Plan for the City and County of San Francisco*
RWS	Regional Water System
SANDAG	San Diego Association of Governments
sb	southbound
SB	Senate Bill
Scoping Plan	*Climate Change Scoping Plan: A Framework for Change*
SCS	Sustainable Communities Strategy
SEL	sound exposure level
SF_6	sulfur hexafluoride
SFBAAB	San Francisco Bay Area Air Basin
SFBC	San Francisco Building Code
SF-CHAMP	San Francisco County Transportation Authority travel demand model
SFCTA	San Francisco County Transportation Authority
SFDPH	San Francisco Department of Public Health
SF Environment	San Francisco Department of the Environment
SFFD	San Francisco Fire Department
SF Guidelines	*Transportation Impact Analysis Guidelines for Environmental Review,* San Francisco Planning Department, October 2002
SFMTA	San Francisco Municipal Transportation Agency
SFMTA Blue Book	*Regulations for Working in San Francisco Streets*
SFO	San Francisco International Airport
SFPD	San Francisco Police Department
SFPL	San Francisco Public Library
SFPL Strategic Plan	*San Francisco Public Library Strategic Plan*

SFPUC	San Francisco Public Utilities Commission
SFRPD	San Francisco Recreation and Park Department
SFSU	San Francisco State University
SFUSD	San Francisco Unified School District
SIP	State Implementation Plan
SM&W	Shen Milsom & Wilke
SMP	site mitigation plan
SNF	skilled nursing facility
SO_2	sulfur dioxide
SoMa	South of Market
SP	service population
SPC-	Structural Performance Category
sq. ft.	square feet
SR	State Route
SS	Sustainable Sites
State CEQA Guidelines	*California Environmental Quality Act Guidelines*
STC	Sound Transmission Class
SUD	Special Use District
Sustainability Plan	*Sustainability Plan for the City of San Francisco*
SVOC	semivolatile organic compound
SVP	Society of Vertebrate Paleontology
SVWTP	Sunol Valley Water Treatment Plant
SWIS	Solid Waste Information System
SWPCP	Southeast Water Pollution Control Plant
SWPPP	storm water pollution prevention plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
TASC	Transportation Advisory Committee
TDM	transportation demand management
TEP	Transit Effectiveness Project
TMDL	total maximum daily load
TMP	transportation management plan
TPY	tons per year
TRU	transportation refrigeration unit
VMT	vehicle miles traveled

UC	University of California
Unified Program	Unified Hazardous Waste and Hazardous Materials Management Regulatory Program
U.S. 101	U.S. Highway 101
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USF	University of San Francisco
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
UWMP	*Urban Water Management Plan for the City and County of San Francisco*
v/c	volume-to-capacity
VdB	velocity decibels
VNAP	*Van Ness Avenue Area Plan*
VNMUSD	Van Ness Medical Use Subdistrict
VOC	volatile organic compound
wb	westbound
WDR	waste discharge requirement
WHO	World Health Organization
WSIP	Water Supply Improvement Program

GLOSSARY

Term	Definition
acute care	Treatment necessary for only a short period of time, when a patient is treated for a brief but severe episode of illness. Many hospitals are acute-care facilities. The term is also associated with care rendered in an emergency department or other short-term stay facility.
administration	Hospital administration and nursing administration office space within a hospital building or outpatient care center building.
ambulatory care	Health care services provided to patients on an outpatient basis (e.g., practitioner consultations, counseling, care for patients staying less than 24 hours), rather than by admission to a hospital or other health care facility. The services may be in a hospital, augmenting inpatient services, or may be provided at a separate facility.
ancillary and support services	Services other than room, board, and medical and nursing services that are provided in the course of care. They include such services as laboratory, radiology, pharmacy, and physical therapy services.
biologicals	Medicinal preparations made from living organisms and their products, including but not limited to serums, vaccines, antigens, and antitoxins (California Medical Waste Management Act, California Health and Safety Code Sections 117600–118360).
building height based on the Planning Code’s methodology	The height of the building measured from its midpoint relative to the average slope of the curb or ground (see Sections 102.12 and 260 of the San Francisco Planning Code). This measurement is provided in this EIR for each proposed near-term, project-level building so that it can be compared to the applicable maximum height allowed by the height and bulk district.
building infrastructure	Space within buildings for, e.g., (a) mechanical, electrical, telephone, and other building services distribution rooms; (b) shafts and exit stairs; and (c) elevator cores, including elevator shafts, mechanical rooms, and elevator queuing areas.
central plant	Space where mechanical (e.g., chilled water, steam), electrical (e.g., emergency power generation, primary power transformation), and other centralized building services are generated and processed for distribution to several buildings or within a hospital, ambulatory care center or medical office building.
complementary care	Therapeutic practices (acupuncture for instance) that are not currently considered an integral part of conventional allopathic (i.e., biologically based, scientific, Western) medical practice, and which are used in addition to conventional treatments.

Term	Definition
critical care	Health care provided to a critically ill patient.
diagnostic and treatment	Diagnostic and treatment (D&T) space, in either inpatient and ambulatory care settings, and ancillary to medical office care, including within procedure rooms and associated spaces. Emergency Department space is not included in D&T space. D&T services include surgery; imaging, including radiology and MRI; gastrointestinal/endoscopy; cardiac catheterization; cardio-diagnostics; neuro-diagnostics; pulmonary function testing; rehabilitation/physical therapy/occupational therapy/speech therapy; nuclear medicine; dialysis.
education/conference	Space available for educational and conference meetings or assemblies.
Emergency Department	Emergency Department space within hospital buildings, including waiting/receiving space, procedural space, ambulance bays, and other associated spaces.
inpatient care	Women's and children’s, adult, and psychiatric acute-care space, including beds, nursing stations, family rooms, and other associated spaces. Involves care of patients staying longer than 24 hours.
life safety standard	The minimum structural performance of a facility during a seismic event that protects the safety of the patients and staff and allows them to exit after the seismic event.
light industrial	Space within buildings used for light-industrial activities (e.g., auto repair).
loading	Space for delivery of materials, trash and recycling pickup, etc.
mechanical and electrical	Dedicated floors or significant space on a floor of a building for distribution of mechanical, electrical, and other building services.
medical office space	Practitioners’ offices and associated spaces within a medical office building (MOB). For all proposed future MOBs, the primary program category will be presumed to be medical office space, and assumptions will be made for lobby space, mechanical and electrical space, and a building grossing factor.
non-RCRA hazardous waste	A solid hazardous waste that is regulated by the State of California that is not regulated by the federal Resource Conservation and Recovery Act (RCRA). A hazardous waste is presumed to be a RCRA hazardous waste unless it is determined pursuant to California Code of Regulations, Title 22, Section 66261.101 to be a non-RCRA hazardous waste.
offices	Office space within buildings other than hospital buildings, ambulatory care center buildings, or medical office buildings.
operational standard	The structural performance of a facility during a seismic event in which backup utility services maintain functionality and very little structural or nonstructural damage occurs.

Term	Definition
parking	Includes parking areas, ramps, access, and other associated spaces.
postacute care	A range of medical care services that support the individual's continued recovery from illness or management of a chronic illness or disability. Services or programs that fall into the category of postacute care include institutional programs such as inpatient rehabilitation facilities, skilled-nursing facilities, and long-term-care hospitals, as well as home- and community-based services, such as home health and hospice care. Additional specialized services span the acute-care and postacute-care continuum, such as palliative care, hospital case management, and discharge planning.
primary care	Care that provides integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community.
recognized environmental conditions	The presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.
research	Clinical or basic research space.
residential	Residential space within a residential building.
residential Alzheimer's	Residential space for patients in the CPMC Alzheimer's Program.
retail	Space for the sale of goods or commodities directly to consumers (e.g., restaurants, cafes, coffee shops, book stores, gift shops).
secondary care	Care provided by medical specialists who generally do not have first contact with patients (e.g., cardiologists, urologists, dermatologists).
sharps waste	Any device having acute rigid corners, edges, or protuberances capable of cutting or piercing, including but not limited to hypodermic needles and broken glass items (such as pipettes and vials) contaminated with biohazardous waste (California Medical Waste Management Act, California Health and Safety Code Sections 117600–118360).
support	Space for uses such as the pharmacy, pathology, laboratory, food service, materials management, and chapels.

Term	Definition
tertiary referral center	A major hospital that usually has a full complement of specific specialty care services (e.g., pediatrics, general medicine, various branches of surgery, psychiatry). Patients will often be referred from smaller hospitals to a tertiary hospital for major operations and consultations with subspecialists, and when sophisticated intensive care facilities are required.

4.5 TRANSPORTATION AND CIRCULATION

This section analyzes the potential impacts on transportation and circulation resulting from implementation of the CPMC *Long Range Development Plan* (LRDP) at the existing and proposed CPMC campuses. Transportation-related issues of concern and potential project impacts addressed in this section include traffic on local roadways, transit, bicycles, pedestrians, freight loading, emergency-vehicle access, and construction-related impacts on transportation and circulation. This section also provides a parking analysis for informational purposes. Transportation impacts are assessed for each campus for weekday p.m. peak-hour conditions, and for the Cathedral Hill Campus, also for a.m. peak-hour conditions. This section also identifies mitigation measures that would reduce or avoid significant impacts, improvement measures to reduce less-than-significant impacts, and considers cumulative impacts.

This section is based on information contained in the individual transportation impact studies for each campus prepared for the Planning Department by Fehr & Peers.[1, 2, 3, 4, 5] These reports, and all other reports prepared for the CPMC LRDP that are cited in this section, are available for review in Case Number 2005.0555E at the San Francisco Planning Department at 1650 Mission Street, Suite 400, San Francisco, CA 94103.

4.5.1 ENVIRONMENTAL SETTING

The transportation study area includes all aspects of the transportation network that may be measurably affected by the CPMC LRDP. The transportation study area is defined by travel corridors and by facilities such as bus stops and transit stations. For this analysis, 81 intersections at five different campus areas were identified as the key locations likely to be affected by the CPMC LRDP and were selected for detailed study of project impacts; these intersections are shown in Figures 4.5-1 through 4.5-5, beginning on page 4.5-2.[6] These intersections were selected for analysis, because they are most likely to experience increases in peak-hour traffic associated with the CPMC LRDP, and because they are typically congested during the peak hours. The transit analysis includes an assessment of the San Francisco Municipal Railway (Muni) lines that would serve the CPMC LRDP campuses and/or would be affected by vehicular traffic generated by project uses.

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1 California Pacific Medical Center. 2010 (June). California Pacific Medical Center, Long Range Development Plan, Cathedral Hill Campus, Transportation Impact Study. San Francisco, CA. Prepared by Fehr & Peers, San Francisco, CA.

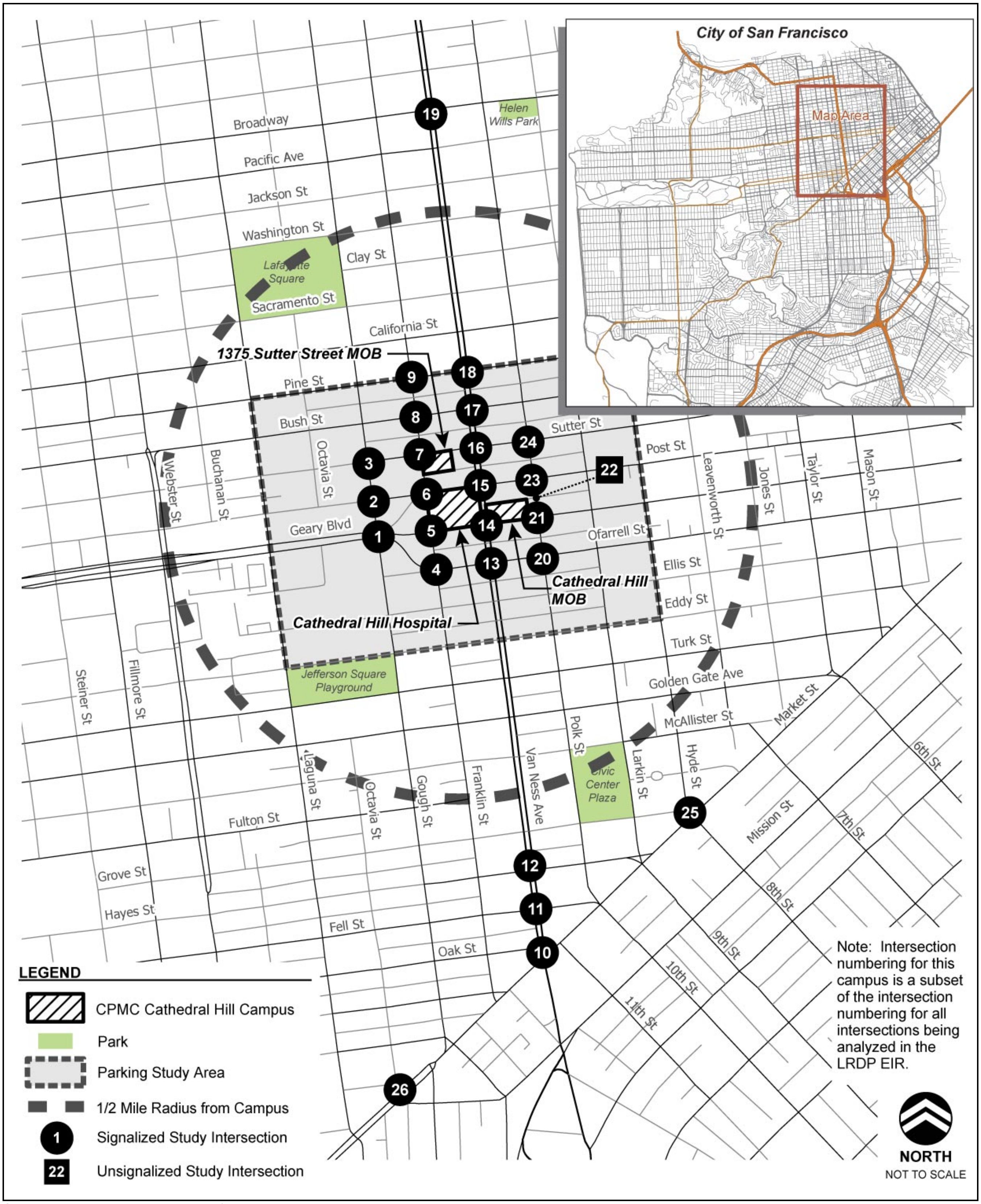
2 California Pacific Medical Center. 2010 (June). California Pacific Medical Center, Long Range Development Plan, Pacific Campus, Transportation Impact Study. San Francisco, CA. Prepared by Fehr & Peers, San Francisco, CA.

3 California Pacific Medical Center. 2010 (June). California Pacific Medical Center, Long Range Development Plan, California Campus, Transportation Impact Study. San Francisco, CA. Prepared by Fehr & Peers, San Francisco, CA.

4 California Pacific Medical Center. 2010 (June). California Pacific Medical Center, Long Range Development Plan, Davies Campus, Transportation Impact Study. San Francisco, CA. Prepared by Fehr & Peers, San Francisco, CA.

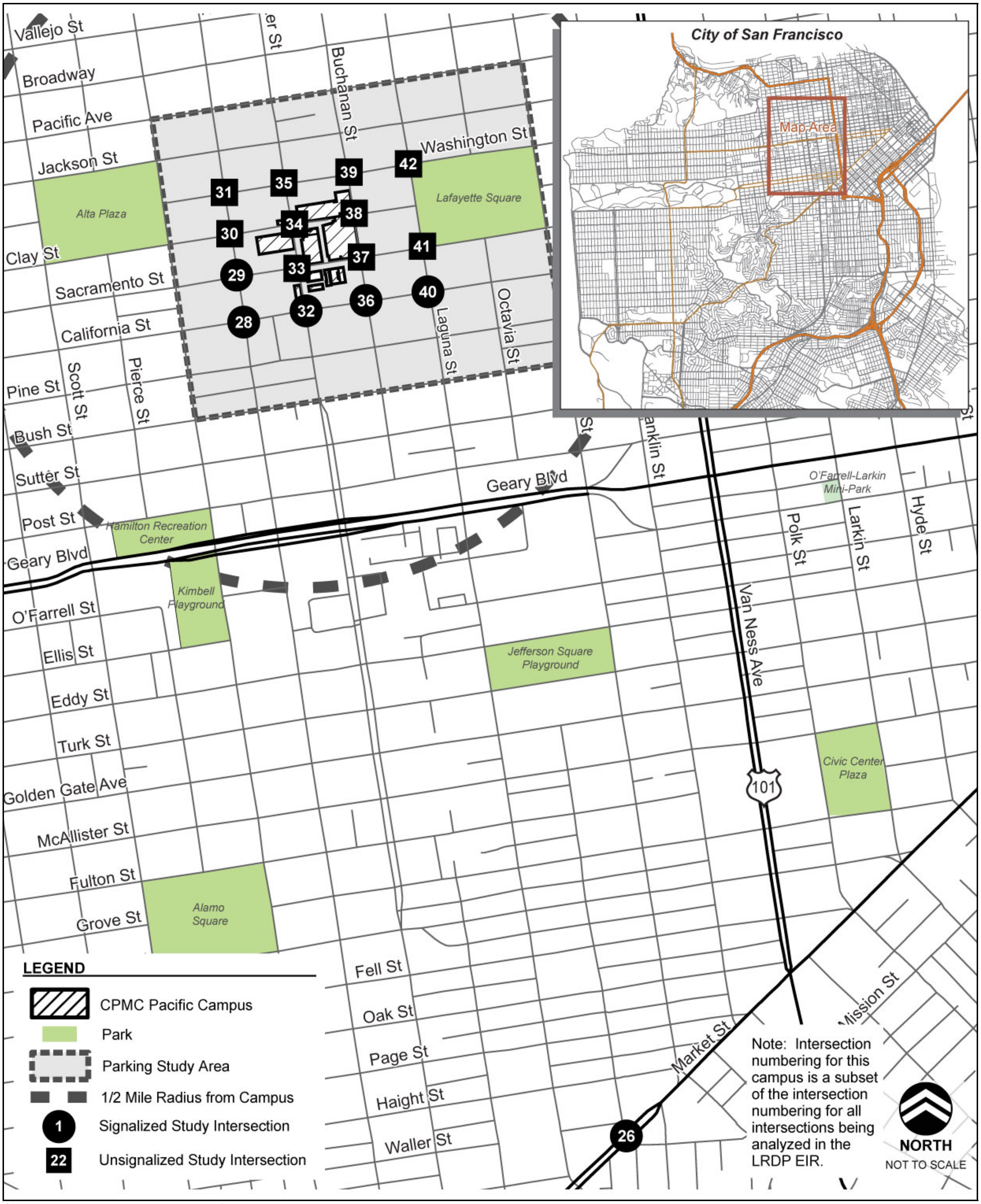
5 California Pacific Medical Center. 2010 (June). California Pacific Medical Center, Long Range Development Plan, St. Luke's Campus, Transportation Impact Study. San Francisco, CA. Prepared by Fehr & Peers, San Francisco, CA.

6 The intersection numbering is taken from the numbering system being used for all CPMC campuses for this analysis.



Source: Data provided by Fehr & Peers in 2010

Cathedral Hill Campus—Study Area and Project Location **Figure 4.5-1**

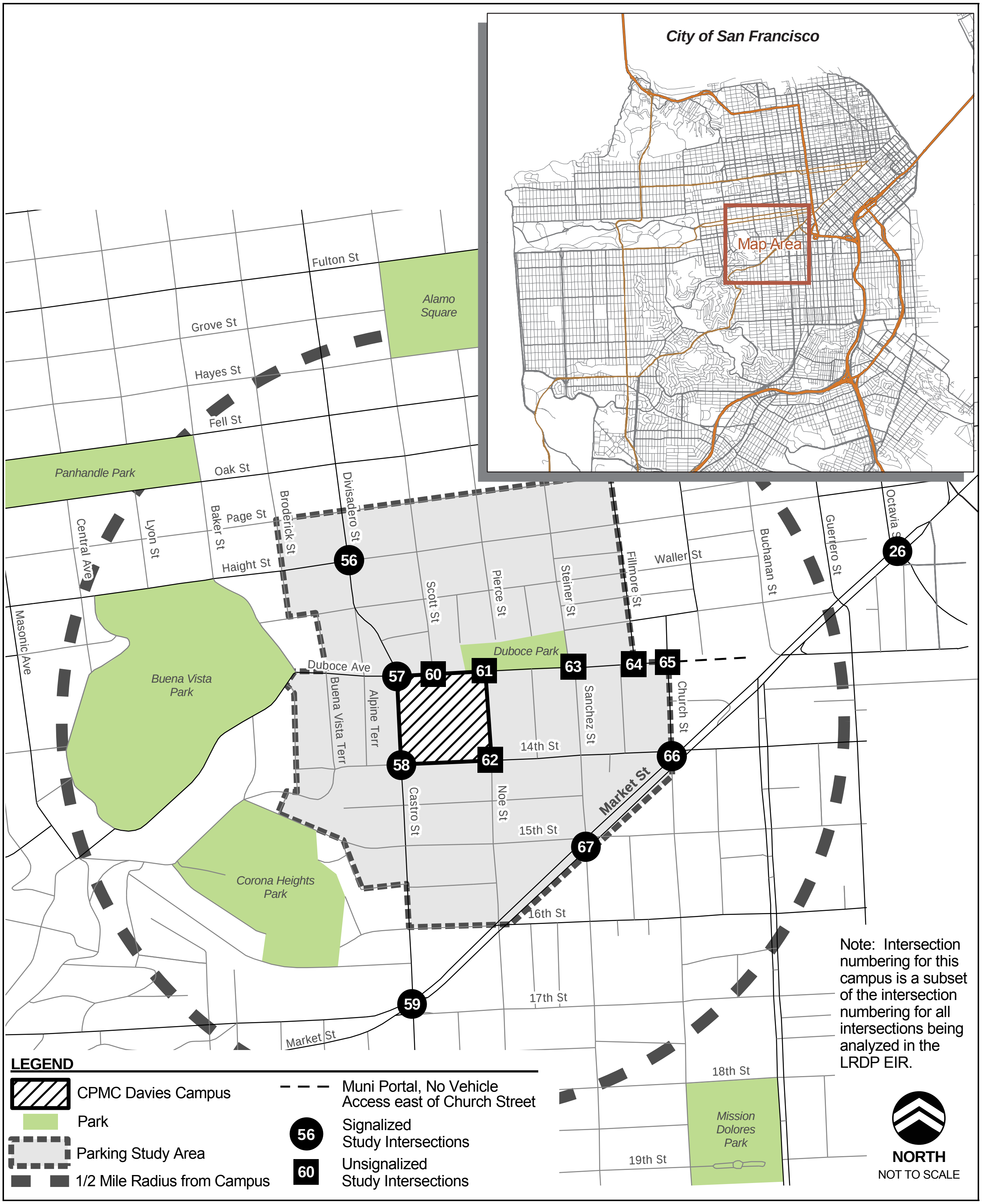


Source: Data provided by Fehr & Peers in 2010

Pacific Campus—Study Area and Project Location **Figure 4.5-2**

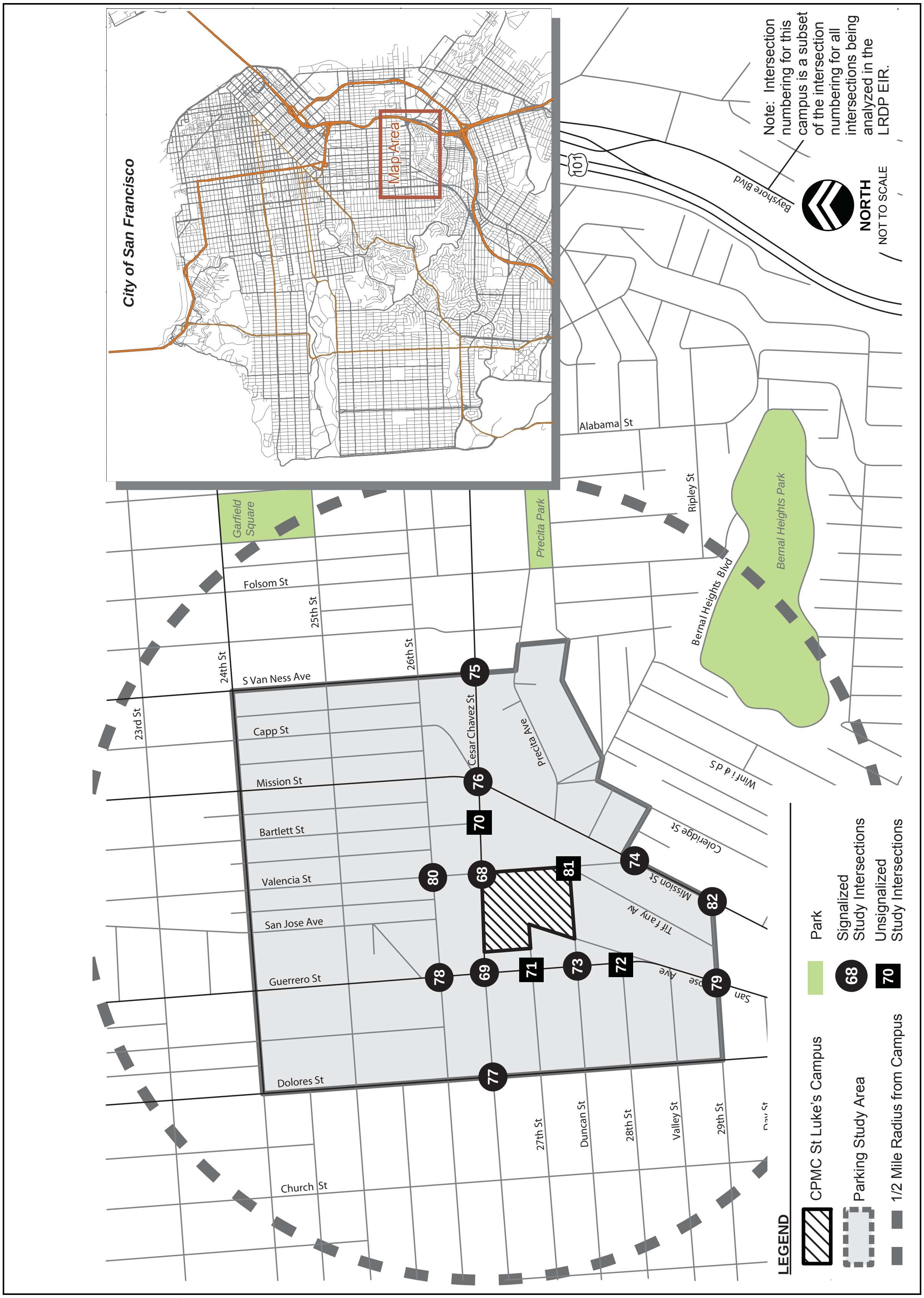
Source: Data provided by Fehr & Peers in 2010

California Campus—Study Area and Project Location **Figure 4.5-3**



Source: Data provided by Fehr & Peers in 2010

Davies Campus—Study Area and Project Location **Figure 4.5-4**



Source: Data provided by Fehr & Peers in 2010

St. Luke's Campus—Study Area and Project Location **Figure 4.5-5**

ROADWAY NETWORK

Regional Access

U.S. Highway 101 (U.S. 101) provides the primary regional access to all CPMC campuses from the north and south. U.S. 101 serves San Francisco, the Peninsula, and the South Bay, and extends north into Marin County via the Golden Gate Bridge. Within San Francisco, Lombard Street and Van Ness Avenue are designated as U.S. U.S. 101. U.S. 101 and Interstate 80 (I-80) merge north of the St. Luke's Campus, and I-80 provides a connection to the East Bay via the San Francisco–Oakland Bay Bridge. I-80 provides primary access to the East Bay communities of Oakland and Berkeley, as well as to other major freeways in the East Bay (Interstates 580 and 880 [I-580 and I-880]), before extending eastward to Sacramento. U.S. 101 also provides primary access to Interstate 280 (I-280), a second major freeway extending south through the Peninsula toward San Jose.

The nearest U.S. 101 freeway ramps serving the existing Pacific, California, and Davies Campuses and the proposed Cathedral Hill Campus are located at South Van Ness Avenue/13th Street and Market Street/Octavia Boulevard. The U.S. 101 freeway ramps at Park Presidio Boulevard (for access to and from the north via the Golden Gate Bridge) serve the California Campus. The U.S. 101 freeway ramps at Potrero Avenue/Bayshore Boulevard/Cesar Chavez Street serve the St. Luke's Campus.

I-280 provides regional access from the South of Market area to southern San Francisco, the Peninsula, and the South Bay. I-280 has an interchange with U.S. 101 south of the St. Luke's Campus. The closest access to I-280 to and from the north is provided via on-ramps and off-ramps at Cesar Chavez Street, and to and from the south via on-ramps and off-ramps at San Jose Avenue.

State Route (SR) 1 connects San Francisco to Marin County and the Peninsula. SR 1 enters San Francisco from the Golden Gate Bridge and U.S. 101 to the north and follows Park Presidio Boulevard, Crossover Drive, 19th Avenue, and Junipero Serra Boulevard before merging with I-280 in Daly City. SR 1 provides access primarily to the California Campus. SR 1 is accessible from the California Campus via California Street and Park Presidio Boulevard.

Local Access

Cathedral Hill Campus

Figure 4.5-1, "Cathedral Hill Campus—Study Area and Project Location" (page 4.5-2), presents the roadway network in the vicinity of the proposed Cathedral Hill Campus and identifies the 26 study intersections. The streets described below provide local access to the site of the proposed campus.

North-South Streets

Franklin Street runs between Bay Street and Market Street. Near the site of the proposed Cathedral Hill Campus, Franklin Street has three to four northbound travel lanes and on-street parking on both sides of the street. In the *San Francisco General Plan* (General Plan), Franklin Street is classified as a Major Arterial in the Congestion Management Program (CMP) Network and is part of the Metropolitan Transportation System (MTS) Network.

Van Ness Avenue is a major roadway that runs between North Point Street and Market Street. Between Market Street and Lombard Street, Van Ness Avenue is designated U.S. 101. Near the site of the proposed Cathedral Hill Campus, Van Ness Avenue is a six-lane roadway (three travel lanes in each direction) with metered parking on both sides of the street. In the General Plan, Van Ness Avenue is classified as a Major Arterial in the CMP Network; it is also part of the MTS Network, a Transit Preferential Street (Primary Transit Street—transit important), part of the Citywide Pedestrian Network, and a Neighborhood Pedestrian Street (neighborhood commercial street).

Polk Street runs between Beach Street and the intersection of Market and Fell Streets. Near the site of the proposed Cathedral Hill Campus, Polk Street operates two ways with one travel lane in each direction and parking on both sides of the street. Between Beach and Market Streets, Polk Street is designated as part of bicycle Route 25.

East-West Streets

Sutter Street runs between Sansome Street and Presidio Avenue. Between Market Street and Gough Street, Sutter Street operates one-way westbound, generally with two travel lanes and one bus-only lane. West of Gough Street, Sutter Street operates two-way. On-street parking is generally allowed on both sides of the street. The General Plan identifies Sutter Street as a Transit Conflict Street in the CMP Network, and a Transit Preferential Street (Secondary Transit Street). Sutter Street is also part of bicycle Route 16.

Post Street runs between Montgomery Street and Presidio Avenue. Near the site of the proposed Cathedral Hill Campus, Post Street operates one-way eastbound with three travel lanes and on-street parking on both sides of the street. East of Gough Street, Post Street is one-way eastbound, with two mixed-flow travel lanes and a Muni-only lane. The General Plan identifies Post Street as a Transit Preferential Street (secondary transit street). Post Street is identified as a Neighborhood Pedestrian Street between Market and Gough Streets, between Laguna and Fillmore Streets, and between Pierce and Divisadero Streets. Post Street is part of bicycle Route 16.

Geary Street/Geary Boulevard is an arterial that runs from Market Street in downtown San Francisco to 48th Avenue in the Richmond District. Geary Boulevard is a two-way roadway between Ocean Beach and Gough Street; east of Gough Street, Geary becomes a one-way westbound roadway. Near the site of the proposed

Cathedral Hill Campus, Geary Boulevard operates one-way westbound with three travel lanes and one Muni bus-only lane. On-street parking is allowed on both sides of the street. In general, intersections along Geary Boulevard in the vicinity of the Cathedral Hill Campus, including Gough Street and Franklin Street, have left-turn prohibitions for travel from Geary Boulevard to the cross streets. The General Plan identifies the entire length of Geary Street/Geary Boulevard as a Major Arterial, a Primary Transit Street (transit important), and a Neighborhood Pedestrian Street (neighborhood commercial street).

Pacific Campus

Figure 4.5-2, "Pacific Campus—Study Area and Project Location" (page 4.5-3), presents the roadway network in the vicinity of the Pacific Campus and identifies the 16 study intersections. The streets described below provide local access to the Pacific Campus.

North-South Streets

Fillmore Street runs from Marina Boulevard to Duboce Avenue. Near the Pacific Campus, Fillmore Street operates as a two-way road with one lane in each direction and parking on both sides of the street. The General Plan identifies Fillmore Street as all of the following:

- Secondary Transit Street (from Chestnut Street to Duboce Avenue),
- Citywide Pedestrian Network Street (between Chestnut Street and Duboce Avenue),
- Neighborhood Network Connection Street (between Geary Boulevard and Haight Street), and
- Neighborhood Commercial Street (between Chestnut Street and Geary Boulevard, and between Haight Street and Waller Street).

Trucks weighing more than 6,000 pounds are restricted on Fillmore Street between Union Street and Broadway.

Webster Street runs between Marina Boulevard and Hermann Street, with an interruption between Bay and Chestnut Streets for the Marina Middle School. Near the Pacific Campus, Webster Street is a two-way street with one lane in each direction and parking on both sides of the street. Trucks weighing more than 6,000 pounds are restricted on Webster Street between Union Street and Pacific Avenue. Between Sutter and Hermann and Streets and between Broadway and Clay Street, Webster Street is part of bicycle Route 10.

Buchanan Street runs from Market Street and Duboce Avenue to Marina Boulevard. Buchanan Street is largely closed to traffic between Grove Street and Sutter Street. Near the Pacific Campus, Buchanan Street is a two-way street with one travel lane in each direction and parking on both sides of the street. Trucks weighing more than 6,000 pounds are restricted on Buchanan Street between Union Street and Pacific Avenue.

East-West Streets

Washington Street runs between The Embarcadero and Arguello Boulevard, with an interruption between Steiner Street and Scott Street for Alta Plaza Park. Near the Pacific Campus, Washington Street operates as a two-way street with one lane in each direction and parking on both sides of the streets. East of Gough Street, Washington Street is one way eastbound.

Clay Street runs between The Embarcadero Plaza and Arguello Boulevard, with interruptions between Gough Street and Laguna Street for Lafayette Park and between Buchanan Street and Webster Street for the Pacific Campus. Near the Pacific Campus, Clay Street is a two-way street with one travel lane each way, except for the block between Laguna Street and Buchanan Street, which is one-way in the westbound direction. Parking is generally allowed on both sides of the street. The General Plan identifies Clay Street as a Neighborhood Network Connection Street between Fillmore Street and Van Ness Avenue, and as a Neighborhood Commercial Street between Polk and Mason Streets. Between Cherry Street and Webster Street, Clay Street is part of bicycle Route 10.

Sacramento Street runs between Drumm Street and Arguello Boulevard. Near the Pacific Campus, Sacramento Street operates as a two-way street with one travel lane in each direction and parking on both sides of the street. The General Plan identifies Sacramento Street as a Secondary Transit Street between Sansome Street and Steiner Street, a Neighborhood Commercial Street between Maple Street and Presidio Avenue and between Franklin Street and Drumm Street, and a Neighborhood Network Connection Street between Fillmore Street and Gough Street. Sacramento Street is a one-way westbound street east of Gough Street.

California Street runs between Drumm Street and 32nd Avenue. Near the Pacific Campus, California Street operates as a two-way street with two travel lanes each way and parking on both sides of the street. The General Plan identifies California Street as all of the following:

- Secondary Arterial (from Van Ness Avenue to 29th Avenue),
- Primary Transit Street (between Presidio Avenue and Park Presidio Boulevard),
- Secondary Transit Street (between 33rd Avenue and Park Presidio Boulevard and between Presidio Avenue and Steiner Street),
- Citywide Pedestrian Network Street (between Fillmore and Market Streets), and
- Neighborhood Commercial Street (between Baker Street and just past 32nd Avenue, as well as between Fillmore and Market Streets).

California Campus

Figure 4.5-3, "California Campus—Study Area and Project Location" (page 4.5-4), presents the roadway network in the vicinity of the California Campus and identifies the 14 study intersections. The streets described below provide local access to the California Campus.

North-South Streets

Arguello Boulevard runs from West Pacific Avenue to Fulton Street. Arguello Boulevard also provides vehicular entrance into Golden Gate Park via Conservatory Drive East and West. Near the California Campus, Arguello Boulevard operates as a two-way street with two travel lanes in each direction and parking on both sides of the street, as well as northbound and southbound bike lanes. The General Plan identifies Arguello Boulevard as a part of the Citywide Pedestrian Network, a Neighborhood Network Connection Street, and part of the Bay, Ridge, and Coast Trails. Between Washington and Fulton Streets, Arguello Boulevard is part of bicycle Route 65.

Palm Avenue runs between California Street and Geary Boulevard. Near the California Campus, Palm Avenue operates as a two-way street with one travel lane in each direction and parking on both sides of the street. Trucks weighing more than 6,000 pounds are restricted from traveling on Palm Avenue.

Cherry Street runs between Jackson Street and California Street. Near the California Campus, Cherry Street operates as a two-way street with two travel lanes in each direction and parking on both sides of the street. Between Washington and Sacramento Streets, Cherry Street is part of bicycle Route 165.

Maple Street runs between Jackson Street and California Street. Near the California Campus, Maple Street operates as a two-way street with one travel lane in each direction and parking on both sides of the street.

Spruce Street runs between Pacific Avenue and Anza Street. Near the California Campus, Spruce Street operates as a two-way street with one lane in each direction and parking on both sides of the street. Trucks weighing more than 6,000 pounds are restricted on Spruce Street between California Street and Geary Boulevard.

East-West Streets

California Street runs between Drumm Street and Lincoln Park. Near the California Campus, California Street operates as a two-way street with two lanes in each direction and parking on both sides of the street. Between Laurel and Spruce Streets, California Street has pull-in angled parking on the south side of the street. The General Plan identifies California Street as Secondary Arterial (between Van Ness Avenue and 29th Avenue), a Primary Transit Street (between Presidio Avenue and Park Presidio Boulevard), and a Secondary Transit Street (between Presidio Avenue and Steiner Street). In addition, California Street is part of the Citywide Pedestrian Network and a Neighborhood Pedestrian Street (neighborhood commercial street).

Sacramento Street runs between Drumm Street and Arguello Boulevard. Near the California Campus, Sacramento Street operates as a two-way street with one travel lane in each direction and parking on both sides of the street. The General Plan identifies Sacramento Street as a Neighborhood Commercial Street between Maple Street and Presidio Avenue. Between Jordan and Arguello Streets, Sacramento Street is part of bicycle Route 165.

Davies Campus

Figure 4.5-4, "Davies Campus—Study Area and Project Location" (page 4.5-5), presents the roadway network in the vicinity of the Davies Campus and identifies the 13 study intersections. The streets described below provide local access to the Davies Campus.

North-South Streets

Castro Street runs between Waller Street and 30th Street, with interruptions between 27th Street and 28th Street. Near the Davies Campus, Castro Street operates as a two-way street with one travel lane in each direction and on-street parking on both sides of the street. In the General Plan, Castro Street is designated as a Major Arterial from Waller Street to Market Street. In addition, Castro Street is classified as a Transit Preferential Street (secondary transit street) from Market Street to 24th Street and is a Neighborhood Pedestrian Street (neighborhood commercial street). North of Waller Street, Castro Street merges into Divisadero Street.

Divisadero Street runs from Marina Boulevard to 14th Street. Near the Davies Campus, Divisadero Street between Waller Street and 14th Street operates as a two-way street with one travel lane in each direction and on-street parking on both sides of the street. North of Waller Street, Divisadero Street operates as a two-way street with two travel lanes each way and parking on both sides of the street. Through traffic traveling south on Divisadero continues on Castro Street. The General Plan identifies Divisadero Street as all of the following:

- Major Arterial (from Castro Street to Pine Street),
- Secondary Arterial (from Pine Street to Lombard Street),
- Secondary Transit Street (from Castro Street to California Street), and
- Neighborhood Commercial Street (between California Street and Haight Street).

In addition, Divisadero Street is part of the CMP network between Castro Street and Pine Street and an MTS street between Lombard Street and Castro Street.

Scott Street runs from Marina Boulevard to Duboce Avenue. Near the Davies Campus, Scott Street is a two-way street with one travel lane in each direction and parking on both sides of the street. North of Haight Street, Scott Street is part of bicycle Route 47.

Noe Street runs between Duboce Avenue and Laidley Street. Near the Davies Campus, Noe Street operates as a two-way street with one travel lane in each direction and on-street parking on both sides of the street. Between Duboce Avenue and Market Street several traffic calming improvements have been constructed, including pedestrian curb extensions, median islands, and angled parking. The General Plan identifies Noe Street as all of the following:

- Primary Transit Street (between Market Street and 17th Street),
- Citywide Pedestrian Network Street (between Duboce Avenue and Market Street), and
- Neighborhood Network Connection Street (from Market Street and Haight Street).

East-West Streets

Duboce Avenue runs from Mission Street to Buena Vista Avenue East. Between Market and Church Streets, it is disrupted by the Muni Metro tunnel portal and Duboce Avenue bike path. Near the Davies Campus, Duboce Avenue is a two-way roadway with one travel lane in each direction, as well as on-street parking on both sides. Between Church and Fillmore Streets, two center lanes are right-of-way for Muni Metro; however, vehicles can use these lanes when Muni trains are not present. The General Plan identifies Duboce Avenue as all of the following:

- Primary Transit Street (from Church Street to Noe Street),
- Bike Path (from Market Street to Church Street),
- Pedestrian Network Street (between Steiner Street and Noe Street), and
- Neighborhood Commercial Street (between Church Street and Castro Street).

Between Church and Sanchez Streets, Duboce Avenue is part of bicycle Route 350.

14th Street runs between Harrison Street and Buena Vista Terrace. Near the Davies Campus, 14th Street has two eastbound travel lanes, one westbound travel lane, and parking on both sides of the street. 14th Street is a one-way street in the eastbound direction from Dolores Street to Folsom Street, and is part of bicycle Routes 30 and Route 47 between Sanchez Street and Harrison Street.

St. Luke’s Campus

Figure 4.5-5, “St. Luke’s Campus—Study Area and Project Location” (page 4.5-6), presents the roadway network in the vicinity of the St. Luke’s Campus and identifies the 15 study intersections. The streets described below provide local access to the St. Luke’s Campus.

North-South Streets

Guerrero Street is a secondary arterial street that runs between Market Street and 28th Street. At its south terminus, Guerrero Street continues onto San Jose Avenue. In the vicinity of the St. Luke's Campus, Guerrero Street operates as a four-lane two-way street with two travel lanes in each direction and parking on both sides of the street. In the General Plan, Guerrero Street is included in the MTS Network.

San Jose Avenue is a major arterial street that runs between 28th Street and Mission Street. At its south terminus, San Jose Avenue merges onto Mission Street. In the vicinity of the St. Luke's Campus, San Jose Avenue is a two-way street with one travel lane in each direction and parking on both sides of the street. San Jose Avenue divides the St. Luke's Campus and between 27th and Cesar Chavez Streets, San Jose Avenue is closed to through traffic, and is used for surface parking. The General Plan identifies San Jose Avenue as a Transit Preferential Street between Cesar Chavez and Broad Streets; San Jose Avenue is also included in the CMP and MTS Networks.

Tiffany Avenue stretches northeast-southwest over one block between Valencia Street and 29th Street. Tiffany Avenue is a two-way street with one travel lane each way and parking on both sides of the street. Tiffany Avenue is part of bicycle Route 45.

Valencia Street is a secondary arterial street that runs between Market Street and Mission Street. In the vicinity of the St. Luke's Campus, Valencia Street operates as a two-way street with one travel lane and a bicycle lane in each direction and parking on both sides of the street. The General Plan identifies Valencia Street as a Neighborhood Commercial Street between 14th and 26th Streets; Valencia Street is also included in the MTS Network. Between McCoppin Street and Tiffany Avenue, Valencia Street is part of bicycle Route 45.

Mission Street runs from The Embarcadero, next to San Francisco Bay, to El Camino Real in Daly City; south of San Jose Avenue, Mission Street is designated as SR 82. In the vicinity of the St. Luke's Campus, Mission Street operates as a four-lane, two-way street with two travel lanes in each direction and parking on both sides of the street. The General Plan identifies Mission Street as a Transit Preferential Street (Primary Transit Street), a Citywide Pedestrian Network Street, and a Neighborhood Commercial Street. Mission Street is also included in the CMP and MTS Networks.

East-West Streets

Cesar Chavez Street is a major arterial street that runs from east of Maryland Street, next to San Francisco Bay, to Douglass Street. In the vicinity of the St. Luke's Campus, Cesar Chavez Street operates as a two-way, six-lane street with three travel lanes in each direction and parking on both sides of the street. The General Plan identifies Cesar Chavez Street as a Major Arterial between San Jose Avenue and Third Street, and a Neighborhood

Commercial Street between Valencia and Shotwell Streets. Cesar Chavez Street is also included in the CMP and MTS Networks. From Sanchez Street to Illinois Street, Cesar Chavez Street is part of bicycle Route 60.

27th Street runs between San Jose Avenue and Douglass Street. In the vicinity of the St. Luke's Campus, 27th Street operates as a two-way street with one travel lane in each direction and parking on both sides of the street.

Duncan Street runs between Valencia Street and Diamond Heights Boulevard. In the vicinity of the St. Luke's Campus, Duncan Street operates as a two-way street with one travel lane in each direction and parking on both sides of the street. Vehicles traveling eastbound on Duncan Street are diverted to Tiffany Street southbound by a traffic island at the west leg of the intersection of Duncan Street with Tiffany and Valencia Streets.

INTERSECTION OPERATIONS

Existing conditions at the 81 study intersections were analyzed for the weekday p.m. (5–6 p.m.) peak hour, which coincides with the existing evening commute period. In addition, the 26 study intersections for the proposed Cathedral Hill Campus were also analyzed for the weekday a.m. (8–9 a.m.) peak commute hour. The intersection of Octavia Boulevard/Market Street/U.S. 101 is included in the analyses for the Cathedral Hill, Pacific, California, and Davies Campuses.

Traffic conditions at the study intersections were evaluated using level of service (LOS). Level of service is a qualitative description of operating conditions ranging from LOS A (i.e., free-flow conditions with little or no delay) to LOS F (i.e., jammed conditions with excessive delays). Section 4.5.4, "Impact Evaluations," presents the analysis methodology and the LOS definitions for signalized and unsignalized intersections. Table 4.5-9, "Level of Service Definitions for Signalized and Unsignalized Intersections" (presented on page 4.5-57 under "Intersection LOS Methodology" in Section 4.5.4, "Significance Criteria"), defines each of the levels of service and shows the correlation between average control delay and LOS.

Existing levels of service at the study intersections are presented by campus in Table 4.5-17, "Levels of Service at Cathedral Hill Campus Study Intersections—A.M. Peak-Hour Conditions" (page 4.5-94); Table 4.5-18, "Levels of Service at Cathedral Hill Campus Study Intersections—P.M. Peak-Hour Conditions" (page 4.5-95); Table 4.5-35, "Levels of Service at Pacific Campus Study Intersections—P.M. Peak-Hour Conditions" (page 4.5-169); Table 4.5-37, "Levels of Service at California Campus Study Intersections—P.M. Peak-Hour Conditions" (page 4.5-180); Table 4.5-38, "Levels of Service at Davies Campus Study Intersections—P.M. Peak-Hour Conditions" (page 4.5-185); and Table 4.5-39, "Levels of Service at St. Luke's Campus Study Intersections—P.M. Peak-Hour Conditions" (page 4.5-202) in Section 4.5.4, "Impact Evaluations." During the weekday p.m. peak hour, most study intersections currently operate at LOS D or better, with the exception of the following:

- **Cathedral Hill Campus**—Six of the 26 study intersections currently operate at LOS E or LOS F during either the a.m. peak hour or the p.m. peak hour, or both (Gough/Geary, Franklin/O'Farrell, Franklin/Bush, and Market/Octavia/U.S. 101 during the a.m. peak hour, Franklin/Sutter during the p.m. peak hour, and Eighth/Market during both the a.m. and p.m. peak hours). Table 4.5-17, "Levels of Service at Cathedral Hill Campus Study Intersections—A.M. Peak-Hour Conditions" (page 4.5-94), presents the intersection LOS operating conditions during the a.m. peak hour for the study intersections located near the proposed Cathedral Hill Campus. Table 4.5-18, "Levels of Service at Cathedral Hill Campus Study Intersections—P.M. Peak-Hour Conditions" (page 4.5-95), presents the intersection LOS operating conditions during the p.m. peak hour for these same intersections.

- **Pacific Campus**—All 16 study intersections currently operate at LOS D or better during the p.m. peak hour. Table 4.5-35, "Levels of Service at Pacific Campus Study Intersections—P.M. Peak-Hour Conditions" (page 4.5-169), presents the intersection LOS operating conditions during the p.m. peak hour for the Pacific Campus study intersections.

- **California Campus**—All 14 study intersections currently operate at LOS D or better during the p.m. peak hour. Table 4.5-37, "Levels of Service at California Campus Study Intersections—P.M. Peak-Hour Conditions" (page 4.5-180), presents the intersection LOS operating conditions during the p.m. peak hour for the California Campus study intersections.

- **Davies Campus**—Five of the 13 study intersections currently operate at LOS E or LOS F during the p.m. peak hour (Divisadero/Haight, Castro/Duboce, Castro/Market/17th, Church/Market/14th, and Sanchez /Market/15th). Table 4.5-38, "Levels of Service at Davies Campus Study Intersections—P.M. Peak-Hour Conditions" (page 4.5-185), presents the intersection LOS operating conditions during the p.m. peak hour for the Davies Campus study intersections.

- **St. Luke's Campus**—Two of the 15 study intersections currently operate at LOS E or LOS F during the p.m. peak hour (Guerrero/27th and Guerrero/28th). Table 4.5-39, "Levels of Service at St. Luke's Campus Study Intersections—P.M. Peak-Hour Conditions" (page 4.5-202), presents the intersection LOS operating conditions during the p.m. peak hour for the St. Luke's Campus study intersections.

TRANSIT

The four CPMC campus sites and the proposed Cathedral Hill Campus site are generally well-served by public transit, with routes providing crosstown, community, downtown, and regional service. Local service within the study area is provided by the San Francisco Municipal Transportation Agency (SFMTA) bus and light rail lines (i.e., Muni), which can be used for access to regional transit operators. Service to and from the East Bay is provided by Bay Area Rapid Transit (BART) and AC Transit; service to and from the Peninsula and South Bay is provided by SamTrans, BART, and Caltrain; and service to and from the North Bay is provided by Golden Gate Transit (GGT) buses and ferries.

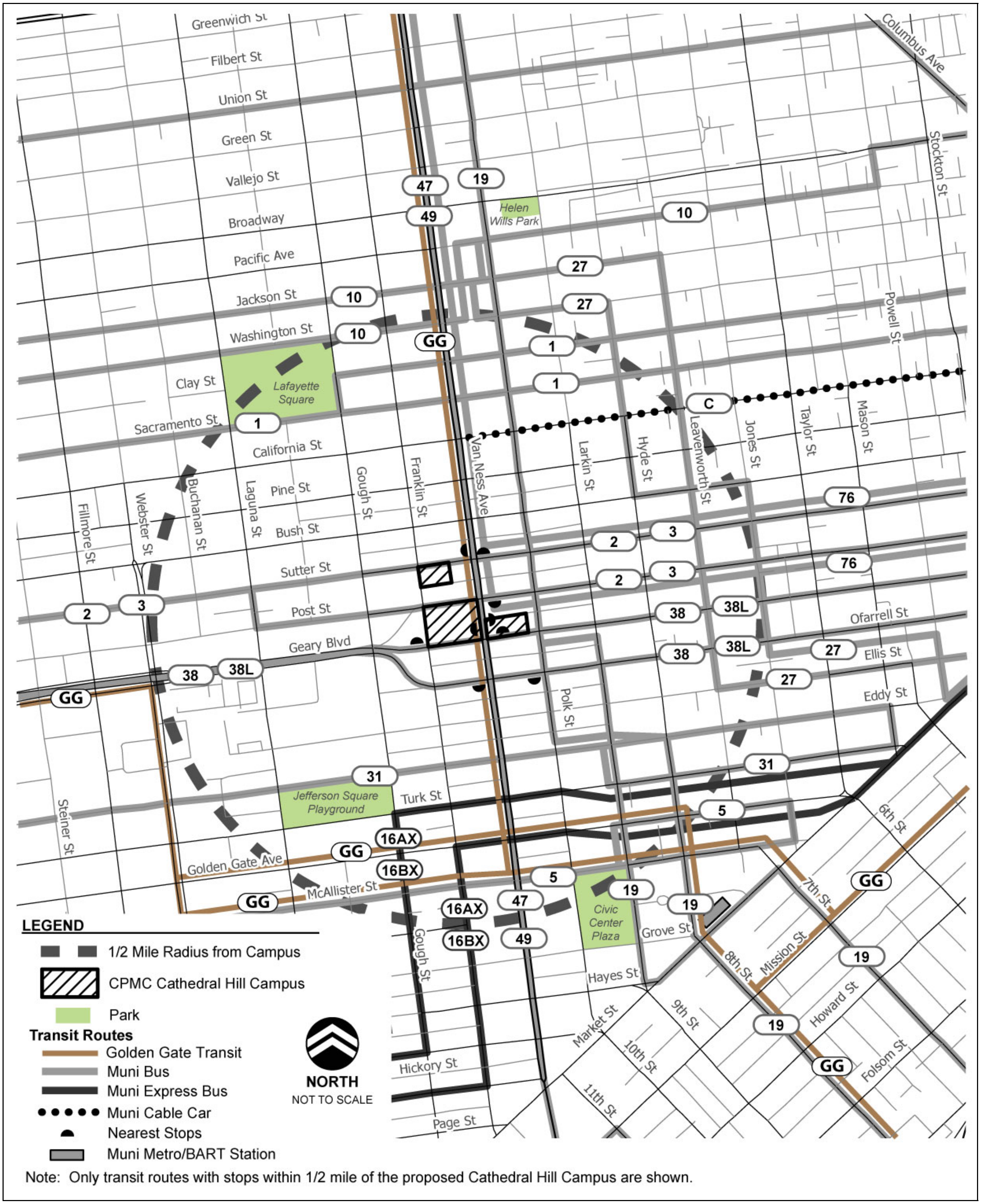
Muni Service

Figures 4.5-6 through 4.5-10 (beginning on page 4.5-18) present the Muni lines serving each campus, while Tables 4.5-1 through 4.5-5 (beginning on page 4.5-23) present the frequency of service for the Muni bus, light rail, and cable car lines serving each study area. The information on frequency of service reflects Muni service before the December 5, 2009 service changes that resulted from SFMTA’s ongoing fiscal emergency.

The SFMTA Board held a hearing on April 7, 2009, to consider a declaration of fiscal emergency; on April 21, the SFMTA Board approved Resolution 09-064, in which SFMTA declared that it found a fiscal emergency existed within the definition of CEQA Section 21080.32. On April 30, the SFMTA Board approved the 2009–2010 amended operating budget and related actions to address the fiscal emergency. On December 5, 2009, Muni service changes associated with the budget deficit were implemented.

The fiscal emergency declared on April 21, 2009, continued through fiscal year 2010. As a result, SFMTA is facing a shortfall in its current fiscal year, which ended on June 30, 2010. To address the continuing fiscal emergency, SFMTA implemented reductions in service beyond those implemented on December 5, 2009. As noted above, the transit service and ridership data do not reflect the recent changes to Muni service resulting from SFMTA’s ongoing fiscal emergency because ridership data for post-implementation conditions is not currently available for all lines.

The existing transit system serving the five campuses was assessed by calculating the existing capacity utilization (riders as a percentage of capacity) at the maximum load point (the point of greatest transit demand) for the lines serving the campuses. The individual lines were also grouped into northbound/southbound and eastbound/westbound corridors. Data obtained from SFMTA’s Transit Effectiveness Project (TEP) was used to calculate the capacity utilization, which was then compared to Muni’s capacity utilization standard of 85 percent. The discussion under “Approach to Impact Analysis” (page 4.5-55) in Section 4.5.4, “Significance Criteria,” presents the transit capacity utilization methodology used in the impact analysis. Table 4.5-21, “Muni Corridor Analysis—Cathedral Hill, St. Luke’s, and California Campuses” (page 4.5-119), and Table 4.5-36, “Muni Corridor Analysis—Pacific, California, and Davies Campuses” (page 4.5-172), in Section 4.5.4, “Impact Evaluations,” present the capacity utilization for the Muni corridor analysis. Capacity utilization for the individual lines, by campus, is presented in the transportation impact studies for the respective campuses.



Source: Data provided by Fehr & Peers in 2010

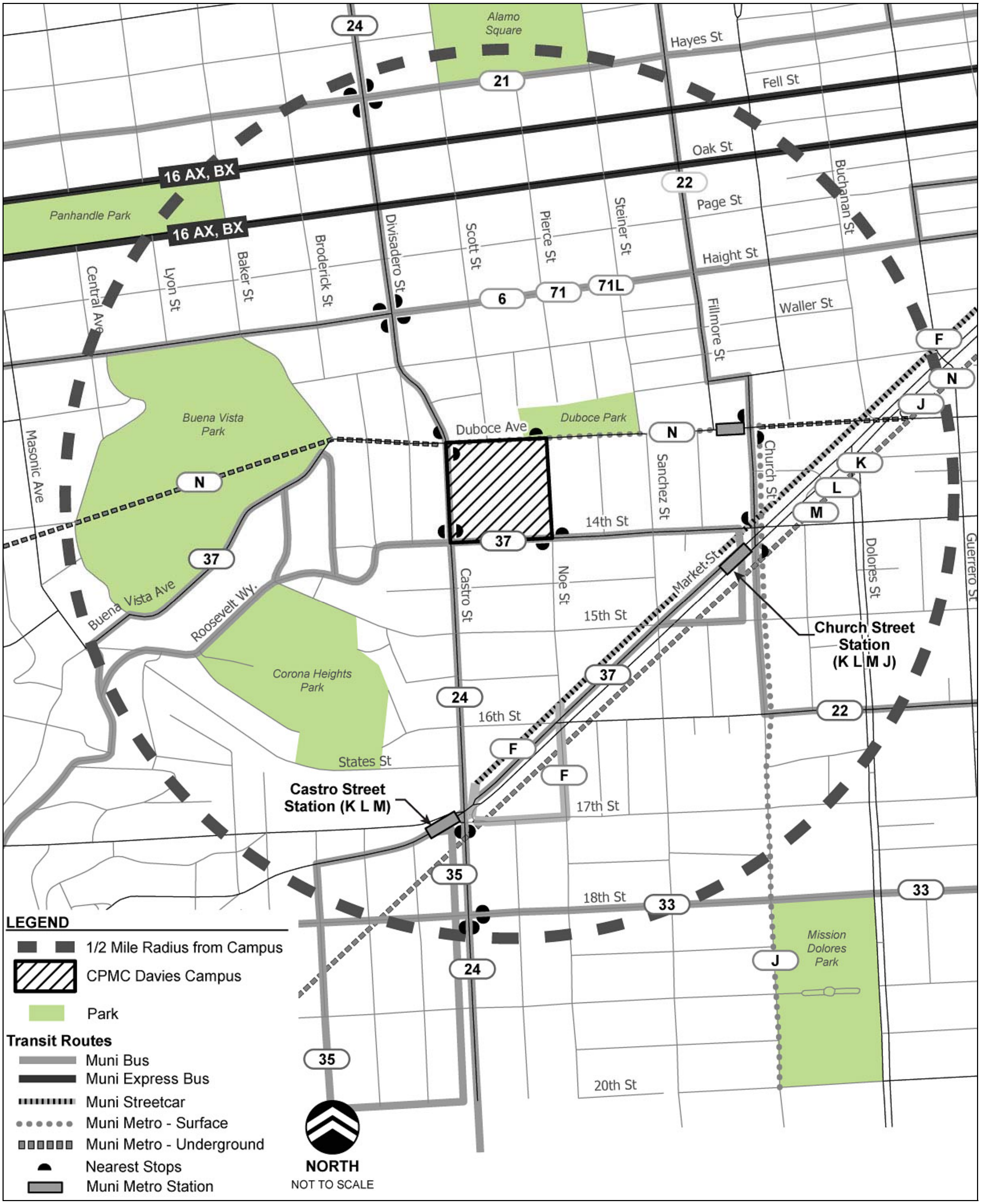
Cathedral Hill Campus—Existing Transit Network **Figure 4.5-6**

Source: Data provided by Fehr & Peers in 2010

Pacific Campus—Existing Transit Network **Figure 4.5-7**

Source: Data provided by Fehr & Peers in 2010

California Campus—Existing Transit Network **Figure 4.5-8**



Source: Data provided by Fehr & Peers in 2010

Davies Campus—Existing Transit Network **Figure 4.5-9**

Source: Fehr & Peers 2010

St. Luke's Campus—Existing Transit Network **Figure 4.5-10**

Table 4.5-1
Muni Lines Serving the proposed Cathedral Hill Campus—Existing Conditions

Route	Frequency of Service[1] (average time between buses in minutes)		
	A.M. Peak Period (7–9 a.m.)	Midday Peak Period (9 a.m.–4 p.m.)	P.M. Peak Period (4–6 p.m.)
1-California	3	6	3
2-Clement	10	20	10
3-Jackson	10	20	10
4-Sutter [2]	15	–	15
5-Fulton	6	8	5
12-Folsom-Pacific	10–20	10–20	10–20
16-AX-Noriega A Express [3]	10	–	15
16-BX-Noriega B Express [3]	10	–	15
19-Polk	10	12	10
27-Bryant	12	12	12
31-Balboa	10	15	10
38-Geary	8	8	6
38L-Geary Limited	7	7	5-7
47-Van Ness	8	9	8
49-Van Ness-Mission	8	9	8
C-California	6	8	8

Notes:
Muni = San Francisco Municipal Railway
1 Frequencies do not reflect December 2009 and May 2010 service changes.
2 4-Sutter service was discontinued in December 2009. The area served by this route is currently served by the 2-Clement and 3-Jackson.
3 16AX/BX-Noriega Express service operates in the peak direction only—inbound to downtown during the a.m. peak period, and outbound from downtown during the p.m. peak period.
Source: Data provided by San Francisco Municipal Transportation Agency in 2008 and compiled by Fehr & Peers in 2010

Table 4.5-2
Muni Lines Serving the Pacific Campus—Existing Conditions

Route	Frequency of Service[1] (average time between buses in minutes)		
	A.M. Peak Period (7–9 a.m.)	Midday Peak Period (9 a.m. –4 p.m.)	P.M. Peak Period (4–6 p.m.)
1-California	3	6	3
2-Clement	10	20	10
3-Jackson	10	20	10
4-Sutter [2]	15	–	15
10-Townsend	10	15	10
12-Folsom-Pacific	10–20	10–20	10–20
19-Polk	10	15	10
22-Fillmore	10	8	7
24-Divisadero	9	10	10
38-Geary	8	8	6
38L-Geary Limited	7	7	5–7
47-Van Ness	8	9	8
49-Van Ness-Mission	8	9	8

Notes:
Muni = San Francisco Municipal Railway
1 Frequencies do not reflect December 2009 and May 2010 service changes.
2 4-Sutter service was discontinued in December 2009. The area served by this route is currently served by the 2-Clement and 3-Jackson.
Source: Data provided by San Francisco Municipal Transportation Agency in 2008 and compiled by Fehr & Peers in 2010

Table 4.5-3
Muni Lines Serving the California Campus—Existing Conditions

Route	Frequency of Service[1] (average time between buses in minutes)		
	A.M. Peak Period (7–9 a.m.)	Midday Peak Period (9 a.m.–4 p.m.)	P.M. Peak Period (4–6 p.m.)
1-California	9	6	8
1BX-California B Express [2]	6	–	15
2-Clement	10	20	10
3-Jackson	10	20	10
4-Sutter [3]	15	–	15
31BX-Balboa Express [2]	10	–	15
33-Stanyan	15	15	15
38-Geary	8	8	6
38L-Geary Limited	7	7	5–7
38BX-Geary B Express [2]	8	–	15
43-Masonic	10	12	12
44-O'Shaughnessy	10	15	10

Notes:
Muni = San Francisco Municipal Railway
[1] Frequencies do not reflect December 2009 and May 2010 service changes.
[2] 1AX/BX, 31AX/BX, and 38BX express services operate in the peak direction only—inbound to downtown during the a.m. peak period, and outbound from downtown during the p.m. peak period.
[3] 4-Sutter service was discontinued in December 2009. The area served by this route is currently served by the 2-Clement and 3-Jackson.
Source: Data provided by San Francisco Municipal Transportation Agency in 2008 and compiled by Fehr & Peers in 2010

Table 4.5-4
Muni Lines Serving the Davies Campus—Existing Conditions

Route	Frequency of Service[1] (average time between buses in minutes)		
	A.M. Peak Period (7–9 a.m.)	Midday Peak Period (9 a.m.–4 p.m.)	P.M. Peak Period (4–6 p.m.)
6-Parnassus	10	12	10
7-Haight	15	–	15
21-Hayes	7	12	7
22-Fillmore	8	8	7
24-Divisadero	9	10	10
33-Stanyan	15	15	15
35-Eureka	20	30	20
37-Corbett	15	30	15
71-Haight/Noriega	10	12	10
71L-Haight/Noriega Limited	10	12	10
F-Market	6	8	7
N-Judah	7	10	7
J-Church	9	10	9
K-Ingleside	9	10	9
L-Taraval	8	10	8
M-Ocean View	9	12	9

Notes:
Muni = San Francisco Municipal Railway
[1] Frequencies do not reflect December 2009 and May 2010 service changes.
Source: Data provided by San Francisco Municipal Transportation Agency in 2008 and Fehr & Peers in 2010

Table 4.5-5
Muni Lines Serving the St. Luke's Campus—Existing Conditions

Route	Frequency of Service [1] (average time between buses in minutes)		
	A.M. Peak Period (7–9 a.m.)	Midday Peak Period (9 a.m.–4 p.m.)	P.M. Peak Period (4–6 p.m.)
12-Folsom-Pacific	20	20	20
14-Mission	6	8	6
14L-Mission Limited	10	10	10
27-Bryant	12	12	12
36-Teresita	30	30	30
48-Quintara-24th Street	12	10	12
49-Van Ness-Mission	8	8	8
67-Bernal Heights	20	20	20
J-Church	9	10	9

Notes:
Muni = San Francisco Municipal Railway
[1] Frequencies do not reflect December 2009 and May 2010 service changes.
Source: Data provided by San Francisco Municipal Transportation Agency in 2008 and compiled by Fehr & Peers in 2010

Existing Muni lines in the vicinity of each CPMC campus site and existing capacity utilization for those lines are described below.

- **Cathedral Hill Campus:** Figure 4.5-6, "Cathedral Hill Campus—Existing Transit Network" (page 4.5-18), presents the 16 Muni transit lines near the site of the proposed Cathedral Hill Campus. Table 4.5-1, "Muni Lines Serving the Cathedral Hill Campus Site—Existing Conditions" (page 4.5-23), presents the frequency of service for these Muni lines. The site of the proposed Cathedral Hill Campus is located in a transit-rich area of San Francisco. Transit riders typically have multiple transit options and will choose their route to the site based on several factors: reliability, headways, type of transit, comfort, and convenience. If one transit line becomes overcrowded, transit riders may choose to take a parallel line with less crowding, even if it requires a longer walk to the transit stop. The existing capacity utilization for the Muni lines serving the site of the proposed Cathedral Hill Campus ranges from 17 percent (C-California cable car) to 101 percent (38L-Geary Limited) during the a.m. peak hour, and from 29 percent (12-Folsom-Pacific) to 108 percent (38L-Geary Limited) during the p.m. peak hour. The 38L-Geary Limited is the only line operating at or above Muni's capacity utilization. The four Muni corridors serving the Cathedral Hill Campus operate at capacity utilization of less than 85 percent during both the a.m. and p.m. peak hours (see Table 4.5-21, "Muni Corridor Analysis—Cathedral Hill, St. Luke's, and California Campuses," on page 4.5-119).

- **Pacific Campus:** Figure 4.5-7, “Pacific Campus—Existing Transit Network” (page 4.5-19), presents the 13 Muni transit lines in the vicinity of the Pacific Campus. Table 4.5-2, “Muni Lines Serving the Pacific Campus—Existing Conditions” (page 4.5-24), presents the frequency of service for these Muni lines. The existing p.m. peak-hour capacity utilization for the Muni lines serving the Pacific Campus vicinity ranges from 29 percent (3-Jackson) to 108 percent (38L-Geary Limited). The 38L-Geary Limited is the only line operating at or above Muni’s capacity utilization. The four Muni corridors serving the Pacific Campus operate at capacity utilization of less than 85 percent during the p.m. peak hour (see Table 4.5-36, “Muni Corridor Analysis—Pacific and Davies Campuses,” on page 4.5-172).

- **California Campus:** Figure 4.5-8, “California Campus—Existing Transit Network” (page 4.5-20), presents the 14 Muni transit lines in the vicinity of the California Campus. Table 4.5-3, “Muni Lines Serving the California Campus—Existing Conditions” (page 4.5-25), presents the frequency of service for these Muni lines. The existing p.m. peak-hour capacity utilization for the Muni lines serving the California Campus vicinity ranges from 29 percent (2-Clement) to 108 percent (38L-Geary Limited). The 38L-Geary Limited and the 44-O’Shaughnessy lines operate at or above Muni’s capacity utilization. The four Muni corridors serving the California Campus operate at capacity utilization of less than 85 percent during the p.m. peak hour (see Table 4.5-36).

- **Davies Campus:** Figure 4.5-9, “Davies Campus—Existing Transit Network” (page 4.5-21), presents the 18 Muni transit lines in the vicinity of the Davies Campus. Table 4.5-4, “Muni Lines Serving the Davies Campus—Existing Conditions” (page 4.5-26), presents the frequency of service for these Muni lines. The existing p.m. peak-hour capacity utilization for the Muni lines serving the Davies Campus vicinity ranges from 19 percent (37-Corbett) to 96 percent (N-Judah). The J-Church, K-Ingleside, L-Taraval, and N-Judah light rail lines operate at or above Muni’s capacity utilization. The four Muni corridors serving the Davies Campus operate at capacity utilization of less than 85 percent during the p.m. peak hour (see Table 4.5-36, page 4.5-172).

- **St. Luke’s Campus:** Figure 4.5-10, “St. Luke’s Campus—Existing Transit Network” (page 4.5-22), presents the nine Muni transit lines in the vicinity of the St. Luke’s Campus. Table 4.5-5, “Muni Lines Serving the St. Luke’s Campus—Existing Conditions” (page 4.5-27), presents the frequency of service for these Muni lines. The existing p.m. peak-hour capacity utilization for the Muni lines serving the St. Luke’s Campus vicinity ranges from 29 percent (12-Folsom-Pacific) to 91 percent (J-Church). The J-Church light rail line operates above Muni’s capacity utilization. The four Muni corridors serving the St. Luke’s Campus operate at capacity utilization of less than 85 percent during the p.m. peak hour (see Table 4.5-21, “Muni Corridor Analysis—Cathedral Hill, St. Luke’s, and California Campuses,” on page 4.5-119).

Regional Transit

Routes served by the San Francisco Bay Area's regional transit agencies and the proximity of these routes to the CPMC campus sites are summarized below.

BART provides regional commuter rail service between the East Bay (from Pittsburg/Bay Point, Richmond, Dublin/Pleasanton, and Fremont) and San Francisco, and between San Mateo County and San Francisco, with operating hours between 4 a.m. and midnight. Within downtown San Francisco, BART operates underground beneath Market Street, and proceeds south through the Mission District toward Daly City after the Civic Center Station. During the weekday p.m. peak period, headways for each line are generally 5–15 minutes. The BART station most easily accessible to the proposed Cathedral Hill Campus and to the Pacific, California, and Davies Campuses is the Civic Center Station, accessible via the intercampus CPMC shuttle (see "CPMC Shuttle Service" on page 4.5-31) or Muni bus and light rail lines. The nearest BART station to the St. Luke's Campus is the 24th Street Station, accessible on foot.

AC Transit, operated by the Alameda–Contra Costa County Transit District, provides bus service in western Alameda and Contra Costa Counties, as well as routes to San Francisco and San Mateo County. AC Transit operates 27 "Transbay" bus routes between the East Bay and the Transbay Terminal, located at First and Mission Streets. To access the proposed Cathedral Hill Campus or the Pacific or California Campus, AC Transit riders would need to transfer to the Muni 38-Geary or 38L-Geary Limited, at the Transbay Terminal. AC Transit riders traveling to the Davies Campus would transfer to the N-Judah or other light rail lines, while those headed to the St. Luke's Campus would transfer to the 12-Folsom-Pacific. Most Transbay service is provided only during commute periods, with headways between buses of approximately 15–20 minutes.

SamTrans is operated by the San Mateo County Transit District, which provides bus and rail service in San Mateo County and select transit routes serving areas outside of the county. SamTrans Routes DX, FX, KX, MX, NX, PX, RX, 292, and 397 serve downtown San Francisco, providing connections to San Mateo County destinations. In general, SamTrans service to downtown San Francisco operates along Mission Street, terminating at the Transbay Terminal at First and Mission streets. To access the proposed Cathedral Hill Campus, SamTrans riders would need to transfer to the 47-Van Ness Muni line at 11th Street.

Caltrain provides passenger rail service on the Peninsula between downtown San Francisco and downtown San Jose, with stops at several communities in San Mateo and Santa Clara Counties. The Peninsula Corridor Joint Powers Board—a joint powers agency consisting of San Francisco, San Mateo, and Santa Clara Counties—operates Caltrain. Limited service is available to communities south of San Jose. Within San Francisco, Caltrain terminates at 4th and King Streets in the South of Market neighborhood, and also has a stop at 22nd Street in Potrero Hill. Both stations are accessible via Muni lines; one or more transfers may be required. Caltrain service headways during the a.m. and p.m. peak periods are between 5 and 20 minutes, depending on the type of train (i.e., local, limited, or express “baby bullet”).

Golden Gate Transit is operated by the Golden Gate Bridge, Highway and Transportation District. GGT provides bus and ferry service between the North Bay (Marin and Sonoma Counties) and San Francisco. GGT operates 22 commuter bus routes, nine basic bus routes, and 16 ferry feeder bus routes into San Francisco. Basic bus routes operate at regular intervals of 15–90 minutes, depending on time and day of week. GGT also operates ferry service between Larkspur and Sausalito in the North Bay and the Ferry Building in San Francisco during the morning and evening commute periods. GGT operates five lines near the Cathedral Hill Campus. The closest stop is located at Van Ness Avenue and Geary Street. GGT Route 10 also operates in the vicinity of the California Campus, and has a stop at the intersection of Geary and Arguello Boulevards.

Table 4.5-6, “Golden Gate Transit Lines in the Vicinity of the Proposed Cathedral Hill Campus—Existing Conditions” (page 4.5-30), summarizes the service frequencies for the GGT lines that serve the site of the proposed Cathedral Hill Campus during the weekday a.m. and p.m. peak periods. Table 4.5-7, “Golden Gate Transit Peak Hour Capacity Utilization—Existing Conditions” (page 4.5-31), presents the number of passengers and capacity utilization factors during the weekday a.m. and p.m. peak hours for each of the five GGT routes that operate within one-half mile of the proposed campus. The maximum load point (MLP) for all five lines occurs at the Golden Gate Bridge transfer stop during the a.m. peak hour and at the Richardson Avenue transfer stop during the p.m. peak hour. As shown in Table 4.5-7, all lines operate at capacity utilization of 74 percent or less.

Table 4.5-6
Golden Gate Transit Lines in the Vicinity of the Proposed Cathedral Hill Campus—Existing Conditions

Route	Direction	Hours of Operation	Frequency of Service (average time between buses in minutes)	
			A.M.	P.M.
Route 10	Southbound Northbound	6:38 a.m.–7:47 p.m. 6:32 a.m.–8:27 p.m.	60 30–60	30–60 60
Route 70	Southbound Northbound	5:27 a.m.–9:01 p.m. 5:18 a.m.–1:55 a.m.	30–60 30–60	50–60 30–60
Route 73[1]	Southbound Northbound	4:59 a.m.–9:51 a.m. 2:58 p.m.–6:43 p.m.	45–60 –	– 30–60
Route 93[1]	Southbound Northbound	7:10 a.m.–8:35 a.m. 4:07 p.m.–5:31 p.m.	10–15 –	– 30
Route 101[1]	Southbound Northbound	4:33 a.m.–7:14 p.m. 7:04 a.m.–8:38 p.m.	60	60

Note:
[1] Route provides commuter service on weekdays only.
Source: Data provided by Golden Gate Transit and compiled by Fehr & Peers in 2009

Table 4.5-7
Golden Gate Transit Peak Hour Capacity Utilization—Existing Conditions

Routes/Direction	Northbound		Southbound	
	Ridership	Capacity Utilization [1]	Ridership	Capacity Utilization
A.M. Peak Hour (7–8 a.m.)				
10	12	30%	18	45%
70	59	74%	41	51%
73	–	–	27	68%
93	–	–	37	31%
101	24	60%	10	25%
P.M. Peak Hour (4–5 p.m.)				
10	13	33%	25	63%
70	45	56%	23	58%
73	53	66%	–	–
93	21	26%	–	–
101	20	50%	14	35%

Note:
[1] Capacity utilization calculated at the at maximum load point in San Francisco, which typically occurs at the intersection of Richardson Avenue and Francisco Street or at the Golden Gate Bridge Toll Plaza.
Source: Data provided by Golden Gate Transit and compiled by Fehr & Peers in 2010.

CPMC Shuttle Service

CPMC currently provides a free shuttle bus service during daytime operating hours (approximately 5 a.m. to 9 p.m.) for doctors, staff, visitors, and patients. Shuttle buses serve CPMC's existing campus sites, as well as the site of the proposed Cathedral Hill Campus (existing Cathedral Hill Hotel and the 1255 Post Street Office building),[7] the off-site leased parking facility at Japantown, and the Civic Center BART/Muni Metro Station. Seven "full-service" fixed shuttle routes operate through the day and three limited-service shuttle routes operate during employee shift changes. The CPMC shuttle service runs from 5 a.m. to 9 p.m. during weekdays. Shuttles run approximately every 20 minutes during the day.

The CPMC shuttle system currently has 15 shuttle vehicles in its fleet, each with a capacity of 14 passengers. On average, 12 shuttle vehicles are in operation within the entire shuttle network. The number of shuttles in service is managed according to fluctuations in demand; reserve shuttles may go into service during peak periods if additional shuttle capacity is needed. Fewer shuttles are in operation during the midday and off-peak periods.

[7] The Cathedral Hill Hotel and the 1255 Post Street Office building ceased operation on October 31, 2009. Some CPMC administrative offices are currently located two blocks north of the proposed Cathedral Hill Hotel site at the existing Pacific Plaza Office Building, the site of the proposed 1375 Sutter Medical Office Building (MOB).

Existing average weekday ridership data for the seven lines were obtained from CPMC and are summarized in Table 4.5-8, “CPMC Shuttle Service—Daily Capacity Utilization- Existing Conditions” (page 4.5-32). The overall daily capacity utilization for the shuttle lines ranges between 17 and 63 percent. However, a large portion of daily shuttle ridership occurs during the peak hours, when employees use the service for a portion of their commute to and from work, and capacity utilization during the peak hours is generally greater. No hourly ridership data were available for the system.

Table 4.5-8
CPMC Shuttle Service Daily Capacity Utilization—Existing Conditions

Route	Weekday P.M. Service (minutes)	Daily Ridership	Daily Capacity Utilization
CH-Line—Cathedral Hill Hotel	20	172	17%
C Line—California/Pacific Campus	15	414	62%
D Line—Davies/Pacific Campus	15	423	63%
JC Express—Japan Center Garage	10	381	38%
BV Line—Civic Center BART & Van Ness/Market	10	503	56%
GMC Line—Geary Mall Garage	15	82	24%
SL Line—St. Luke’s/Davies	30	30	18%

Notes:
BART = Bay Area Rapid Transit
Ridership numbers presented as average number of passengers over the course of a weekday; higher capacity utilization occurs during peak periods.
Passenger count data collected the week of June 4–8, 2007.
Sources: Data provided by CPMC and Wilbur Smith Associates in 2008

Bicycles

Existing bicycle facilities in the vicinity of the five campus sites include routes that are part of the San Francisco Bicycle Network. Bikeways are typically classified as Class I, Class II, or Class III facilities. Class I bikeways are bike paths with exclusive right-of-way for use by bicyclists or pedestrians. Class II bikeways are bike lanes striped within the paved areas of roadways and established for the preferential use of bicycles, and Class III bikeways are signed bike routes where bicycles share the street with vehicles.

The Environmental Impact Report (EIR) for the *San Francisco Bicycle Plan* was certified by the San Francisco Planning Commission in June 2009.[8] This EIR has been challenged in San Francisco Superior Court and a hearing has been set for June 2010. The “Future Transportation Improvements” discussion on page 4.5-61 in Section

8 San Francisco Planning Department. 2009 (August). San Francisco Bicycle Plan Final Environmental Impact Report, San Francisco, CA. Planning Department Case No. 2007.0347E.

4.5.3, “Significance Criteria,” presents the planned *San Francisco Bicycle Plan* improvements in the vicinity of the CPMC campuses.

Cathedral Hill Campus

Figure 4.5-11, “Cathedral Hill Campus Site—Existing Bicycle Route Network” (page 4.5-34) presents the existing bicycle route network in the vicinity of the proposed Cathedral Hill Campus. Four bicycle routes exist in this area:

- Route 16 on eastbound Post Street and on westbound Sutter Street (Class III);
- Route 20 on McAllister Street (Class III);
- Route 25 on Polk Street (Class II between Market and Post Streets and between Union and Beach Streets, and Class III between Post and Union Streets); and
- Route 310 on California Street (Class III).

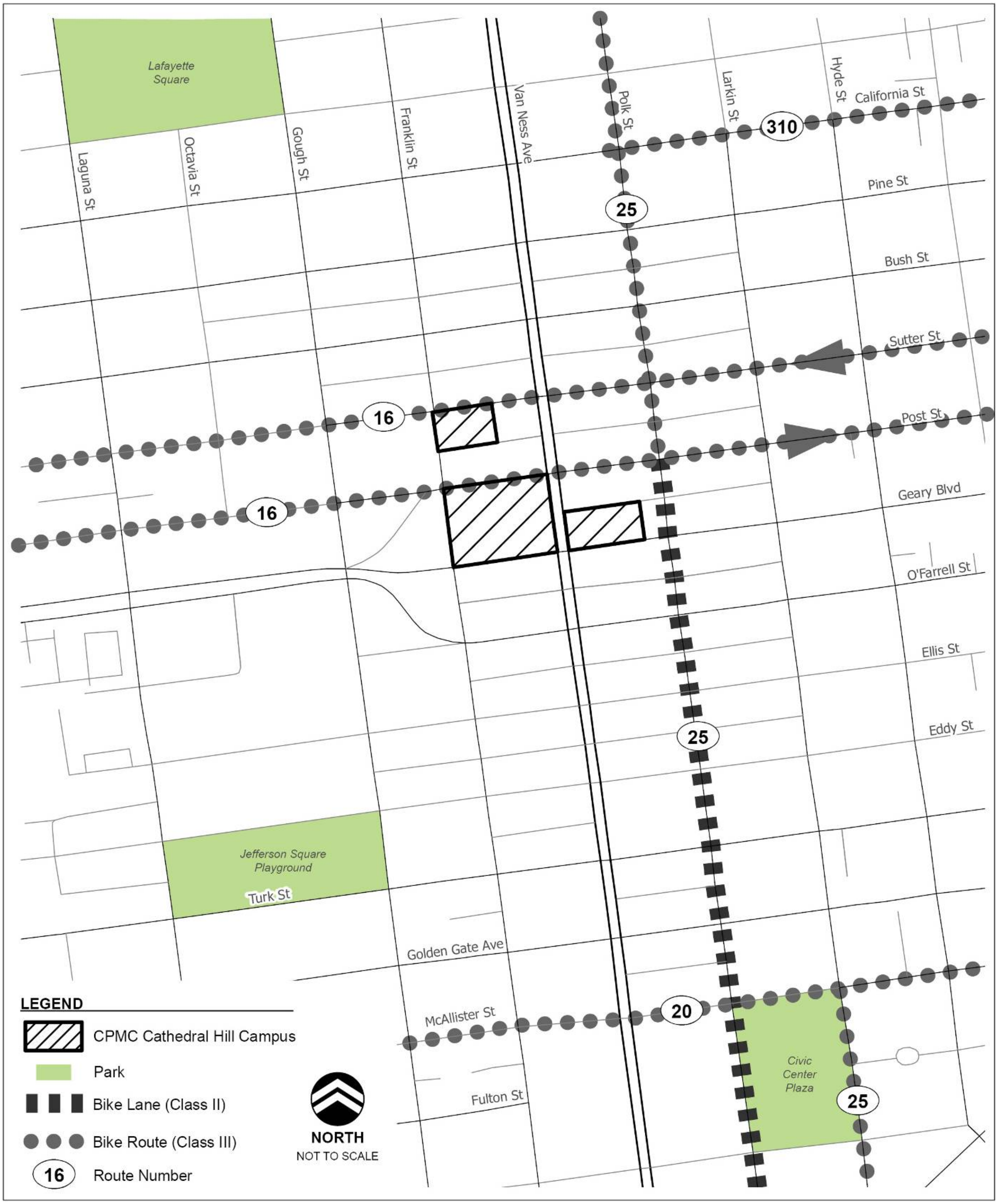
Bicycle counts were conducted along the eastbound Route 16 on Post Street, and northbound/southbound Route 25 on Polk Street in August 2006 during the a.m. (7–9 a.m.) and p.m. (4–6 p.m.) peak periods. In general, relatively low bicycle volumes were observed during both the a.m. and p.m. peak periods along Route 16 on Post Street. Bicycle volumes along Route 25 on Polk Street were substantially greater, about 60–100 bicyclists per hour in both directions of travel. Bicycle operating conditions were observed to be acceptable, with only minor conflicts between bicyclists, pedestrians, and vehicles. According to SFMTA, the intersection of Geary/Polk is among those intersections identified as having the highest number of bicycle injury collisions in 2008, and for the 5-year period between 2004 and 2008. [9]

Pacific Campus

Figure 4.5-12, “Pacific Campus—Existing Bicycle Route Network” (page 4.5-35), presents the bicycle route network in the vicinity of the Pacific Campus. Six bicycle routes exist in this area:

- Route 10 on Clay Street (Class III);
- Route 16 on eastbound Post Street and westbound Sutter Street (Class III);
- Route 20 on McAllister Street (Class III);

[9] SFMTA. 2010 (February). City of San Francisco Bicycle Collision Report. San Francisco, CA.



Source: Data compiled by Fehr & Peers in 2010

Cathedral Hill Campus Site—Existing Bicycle Route Network **Figure 4.5-11**

Source: Data compiled by Fehr & Peers in 2010

Pacific Campus—Existing Bicycle Route Network **Figure 4.5-12**

- Route 25 on Polk Street (Class II between Market Street and Post Street and between Union Street and Beach Street, and Class III between Post and Union Street);

- Route 45 on Steiner Street (Class III); and

- Route 345 on Webster Street (Class II).

Bicycle access to the Pacific Campus is more challenging than access to the other campuses because the campus lies at a higher elevation than nearby neighborhoods. Many streets approaching the Pacific Campus have grades greater than 10 percent.

Bicycle counts were conducted in August 2006 during the p.m. peak hour along northbound and southbound Webster Street along Route 10. Bicycle volumes in the vicinity of the Pacific Campus are generally low. During field observations, bicycle operating conditions were observed to be acceptable. According to SFMTA, no intersections within the Pacific Campus study area have experienced a substantial amount of bicycle injury collisions.

California Campus

Figure 4.5-13, “California Campus—Existing Bicycle Network” (page 4.5-37), presents the existing bicycle route network in the vicinity of the California Campus. Four bicycle routes exist in this area:

- Route 10 on Clay Street (Class II);
- Route 55 on Presidio Avenue (Class III);
- Route 65 on Arguello Boulevard (Class II); and
- Route 165 on Cherry Street, Sacramento Street, and Jackson Street (Class III).

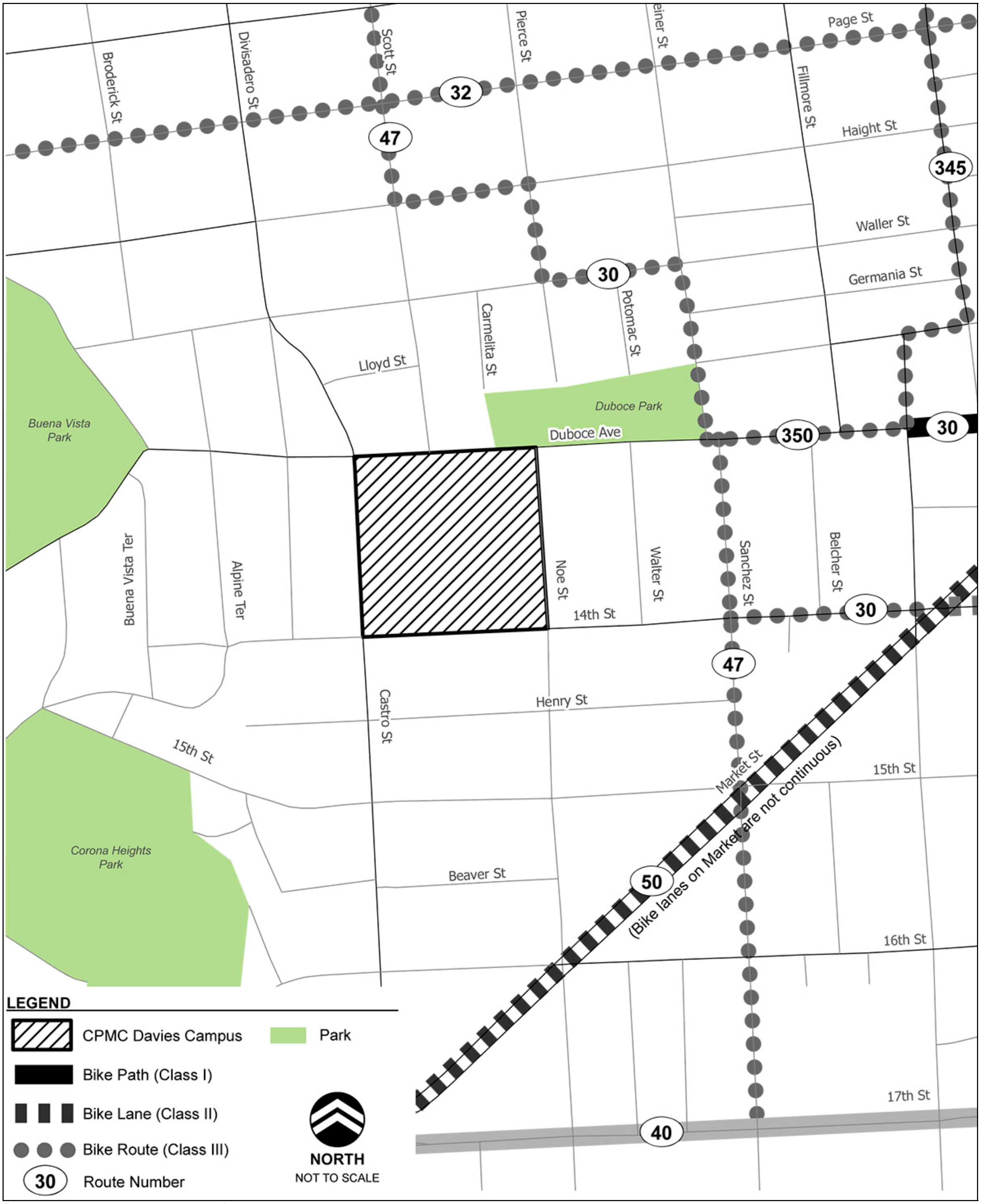
Bicycle counts were conducted near the California Campus in August 2006 during the p.m. peak hour along the eastbound/westbound Route 10 on Clay Street, along the northbound/southbound Route 65 on Arguello Boulevard, and along the eastbound/westbound Route 165 on Sacramento Street. Low bicycle volumes were observed on Clay Street and Sacramento Street, while volumes on Arguello Boulevard were greater—20 to 30 bicyclists per hour per direction. No substantial safety or right-of-way issues were observed in the vicinity of the California Campus. According to SFMTA, no intersections within the California Campus study area experienced a substantial amount of bicycle injury collisions.

Davies Campus

Figure 4.5-14, “Davies Campus—Existing Bicycle Route Network” (page 4.5-38), presents the bicycle route network in the vicinity of the Davies Campus. Six Class III bicycle routes exist in this area:

Source: Data compiled by Fehr & Peers in 2010

California Campus—Existing Bicycle Route Network **Figure 4.5-13**



Source: Data compiled by Fehr & Peers in 2010

Davies Campus—Existing Bicycle Route Network **Figure 4.5-14**

- Route 30 on Duboce Avenue ("the Wiggle"[10]);
- Route 32 on Page Street;
- Route 40 on 17th Street;
- Route 47 on Sanchez Street ("the Wiggle");
- Route 350 on Duboce Avenue ("the Wiggle"); and
- Route 345 on Webster Street.

Bicycle counts were conducted near the Davies Campus in August 2006 during the p.m. peak hour along the eastbound/westbound Route 30 on Duboce Avenue. About 110 westbound and 20 eastbound bicyclists were observed during the p.m. peak hour. At the intersection of Sanchez Street and Duboce Avenue, several vehicles were observed to not yield to cyclists. The intersection of Church Street and Duboce Avenue is noted for being challenging for bicyclists because of the light rail tracks and vehicle movements at the intersection; however, the intersection has high levels of bicycle traffic and is located at the end of the Duboce Avenue bike path, which connects the Wiggle bike routes to Market Street. SFMTA's ongoing light rail replacement project along Duboce Avenue and Church Street will include improvements for pedestrians and bicyclists. According to SFMTA, no intersections within the Davies Campus study area have experienced a substantial amount of bicycle injury collisions.

St. Luke's Campus

Figure 4.5-15, "St. Luke's Campus—Existing Bicycle Route Network" (page 4.5-40), presents the bicycle route network in the vicinity of the St. Luke's Campus. Four bicycle routes exist in this area:

- Route 33 on Harrison Street (Class II north of 23rd Street, Class III between 23rd Street and 26th Street, and Class II between 26th Street and Cesar Chavez Street);

- Route 45 on Valencia, Tiffany, 29th, Dolores, and 30th Streets (Class II on Valencia Street between McCoppin Street and Tiffany Avenue, Class III on Tiffany Street between Valencia and 29th Streets, Class III on 29th Street between Tiffany Avenue and Dolores Street, Class III on Dolores Street between 29th and 30th Streets, and Class III on 30th Street between Dolores and Chenery Streets);

- Route 49 on Sanchez Street (Class III); and

- Route 60 on Cesar Chavez Street (Class III).

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[10] The "Wiggle" is the local reference to the connected set of bike facilities that exist between Market Street and the Panhandle via Duboce Avenue, Steiner Street, Waller Street, Haight Street, Scott Street, and Fell Street.

Source: Data compiled by Fehr & Peers in 2010

St. Luke's Campus—Existing Bicycle Route Network **Figure 4.5-15**

Bicycle counts were conducted in October 2008 during the p.m. peak hour. Bicycle volumes on Cesar Chavez Street are generally low (up to 10 bicyclists per hour), but are much higher on Valencia Street (between 50 and 110 bicyclists per direction per hour). During the p.m. peak hour, the southbound bicycle volumes on Valencia Street were higher than the northbound volumes. Bicycle operating conditions were observed to be acceptable, with only minor conflicts between bicyclists, pedestrians, and vehicles. According to SFMTA, no intersections within the St. Luke's Campus study area have experienced a substantial amount of bicycle injury collisions.

Pedestrians

This section describes the existing pedestrian environment around the existing and proposed CPMC campuses. Pedestrian facilities include sidewalks, crosswalks, curb ramps, and pedestrian signals and countdown timers. Pedestrian facilities and conditions were assessed qualitatively except at the site of the proposed Cathedral Hill Campus, where midday and p.m. peak-hour conditions for pedestrians at crosswalks at adjacent intersections were analyzed quantitatively.

Cathedral Hill Campus

The site of the proposed Cathedral Hill Campus slopes downward from north to south from Post Street to Geary Boulevard/Geary Street, and slopes downward from west to east from Franklin Street to Polk Street. There are approximately 10-foot and 9-foot changes in grade from Post Street (north) to Geary Boulevard (south) along Franklin Street and Van Ness Avenue, respectively. There are approximately 30-foot and 29-foot changes in grade from Franklin Street (west) to Van Ness Avenue (east) along Post Street and Geary Boulevard, respectively. There are approximately 30-foot and 23-foot changes in grade from Van Ness Avenue (west) to Polk Street (east) along Post Street and Geary Street, respectively.

Sidewalks near the proposed Cathedral Hill Campus are generally 10 to 15 feet wide. All of the signalized intersections have crosswalks at all four crossings and operate with fixed-time signals, which means that pedestrian WALK phases are called automatically every signal cycle, and pedestrian pushbuttons are not required. However, pushbuttons have been installed at some signals to activate an Accessible Pedestrian Signal, which consists of audible and/or tactile WALK indications for pedestrians with visual impairments. Pedestrian countdown signals are located at the intersection of Van Ness Avenue and Geary Street.

The Cathedral Hill Hotel and the 1255 Post Street Office Building[11] occupies the site of the proposed Cathedral Hill Hospital. The primary pedestrian entrance to the hotel is located on Van Ness Avenue between Post and Geary Streets. Pedestrian counts were conducted in August 2006 at the pedestrian entrances of the Cathedral Hill Hotel during the a.m. (7–9 a.m.) and p.m. (4–6 p.m.) peak periods. The hotel, when operational in 2006, generated

[11] The Cathedral Hill Hotel and 1255 Post Street Office building ceased operation in October 31, 2009.

about 400 pedestrians per hour during the a.m. peak hour and about 440 pedestrians per hour during the p.m. peak hour. During both the a.m. and p.m. peak hours, the highest pedestrian volumes occurred at Cathedral Hill Hotel/Upper Level Drive and Van Ness Avenue/Geary Street. Muni bus stops located on the corners of Van Ness and Geary, Van Ness and Post, Geary and Franklin, and mid-block at Geary Street between Polk and Van Ness also serve as important pedestrian origins and destinations.

Pedestrian crosswalk counts were also conducted in August 2006 at six intersections in the vicinity of the proposed Cathedral Hill Campus during the midday and p.m. peak periods. Crosswalk LOS analysis indicates that the existing crosswalks operate at LOS D or better. At the Van Ness Avenue/Geary Street and Van Ness Avenue/Post Street intersections, the north and south crossings of Van Ness Avenue are LOS A during both the midday and p.m. peak hours, and the east and west crossings of Geary Street and Post Street are more congested, at LOS C and LOS D. The “Methodology” discussion on page 4.5-54 in Section 4.5.4, “Significance Criteria,” presents the pedestrian LOS methodology; Table 4.5-25, “Pedestrian Crosswalk LOS Analysis for the Proposed Cathedral Hill Campus—Midday Peak-Hour Conditions” (page 4.5-133), and Table 4.5-26, “Pedestrian Crosswalk LOS Analysis for the Proposed Cathedral Hill Campus—P.M. Peak-Hour Conditions” (page 4.5-134), presented under Impact TR-40, present the crosswalk analysis results for the midday and p.m. peak hours, respectively.

Pacific Campus

The Pacific Campus slopes downward from north to south near Clay Street toward Sacramento Street, and slopes downward from east to west from Buchanan Street to Webster Street. There is an approximately 80-foot grade change in the site vicinity between Buchanan Street (east) and Webster Street (west).

Sidewalks near the Pacific Campus are generally 12–15 feet wide. Pedestrian crosswalks are provided at most intersections in the campus vicinity, with the exception of the unsignalized intersection of Laguna and Washington Streets, which does not have crosswalks. The signalized study intersections have pedestrian signals for one or both street crossings.

The primary pedestrian entrance for the Pacific Campus is located on Webster Street. Primary pedestrian attractions in the area include the CPMC shuttle stop located on Buchanan Street between Clay and Sacramento Streets, the Muni bus stop located at the southwest corner of Sacramento and Webster Streets, and a passenger loading/unloading zone located on Webster Street between Sacramento and Clay Streets. Muni bus stops located on the corners of Webster and Sacramento Streets, Webster and Washington Streets, and Fillmore and Sacramento Streets also serve as important pedestrian origins and destinations.

Pedestrian conditions in the vicinity of the Pacific Campus were observed during field visits to the site. Overall, pedestrian volumes on the sidewalks are generally low to moderate (i.e., 50–200 pedestrians per hour). In general, pedestrians moved at normal walking speeds and had freedom to bypass other pedestrians as needed. Campus driveways were observed in the immediate vicinity of the Pacific Campus at the following locations: Sacramento Street (between Webster and Buchanan Streets), Webster Street (between Sacramento and Washington Streets), and Buchanan Street (between Clay and Sacramento Streets). Minimal pedestrian/vehicle conflicts were observed at the driveways serving the campus. In addition, occasional pedestrian/vehicle conflicts were observed at the intersection of Webster and Clay Streets.

The passenger loading/unloading (white) zones on Webster Street (140 feet in length) and Buchanan Street (100 feet in length) were the busiest passenger loading/unloading zones for visitors to the Pacific campus. During peak mid-morning and mid-afternoon demand periods, the Webster Street passenger zone was oversubscribed, with several vehicles double-parking curb spaces or blocking crosswalks at intersections. This is a safety concern for pedestrian circulation because pedestrians are required to navigate around parked cars as they cross a street. The existence of double-parked cars on Webster Street also affects vehicle circulation because cars are required to navigate around parked vehicles in the lane of travel. However, no substantial queuing issues were observed because Webster Street is a relatively low-volume local street.

California Campus

The California Campus slopes downward from north to south and gradually downward to the west. Elevations range from about 254 feet at the northeast corner of the campus to 210 feet at the southwest corner.

The main pedestrian entrance to the California Campus is located on California Street between Cherry and Maple Streets. Additional pedestrian access to the campus is located on Cherry Street between California and Sacramento Streets, on Sacramento Street between Cherry and Maple Streets, and on California Street between Maple and Spruce Streets.

Sidewalks in the vicinity of the California Campus are generally 10–15 feet wide. All of the study intersections have crosswalks except the unsignalized intersections of Commonwealth Avenue and California Street and Palm Avenue and California Street, where crosswalks are provided for some of the crossings. The crosswalk on the west leg of the unsignalized Commonwealth Avenue/California Street intersection is located adjacent to the main entrance to the California Campus.

Field observations of pedestrian conditions in the California Campus vicinity indicated low to moderate pedestrian volumes (i.e., 50–200 pedestrians per hour). In general, pedestrians moved at normal walking speeds and had freedom to bypass other pedestrians as needed. Several driveways were observed serving the off-street parking facilities on Cherry Street (between California and Sacramento Streets), on Maple Street (between Sacramento and California Streets), at 3773 Sacramento Street, and at 3698 California Street. Although pedestrians were observed to occasionally pause to allow vehicles to enter and exit, this did not substantially affect pedestrian behavior.

Davies Campus

The Davies Campus slopes downward from west to east from Castro Street toward Noe Street, and slopes downward from north to south from Duboce Avenue to 14th Street. Noe Street (north to south) and Castro Street, the east and west borders of the Davies Campus, are relatively flat. There is an approximately 61-foot change in grade from Castro Street (west) to Noe Street (east) along Duboce Avenue; and an approximately 80-foot grade change from Castro Street (west) to Noe Street (east) along 14th Street.

The main pedestrian entrance to the Davies Campus is located off Castro Street, with a secondary entrance on Duboce Avenue, located between the existing 45 Castro MOB (located in the northwest corner of the campus at Castro Street and Duboce Avenue) and the Davies Hospital North Tower. Pedestrian activity in the vicinity of the pedestrian entrance is associated with walking trips to and from the Muni bus stops at Castro Street and Duboce Avenue and at Castro and 14th Streets, the Muni Metro N-Judah stop on Duboce Avenue at Duboce Park, the Castro Street/14th Street Parking Garage, and the existing 45 Castro MOB.

Sidewalks near the Davies Campus are generally 9–19 feet wide. All study intersections have crosswalks except the east crossing of Duboce Avenue at Scott Street. Several intersections in the Duboce Triangle area have pedestrian curb extensions at intersections that shorten pedestrian crossing distances and slow turning vehicles.

Field observations indicated that pedestrian volumes on the sidewalks adjacent to the campus are generally low to moderate (i.e., 50–200 pedestrians per hour). In general, pedestrians moved at normal walking speeds and had freedom to bypass other pedestrians or obstacles as needed. During the p.m. peak hour, sidewalks and crosswalks serving the Duboce Park/East Portal N-Judah Muni stop experience higher pedestrian volumes and pedestrian congestion when light rail vehicles are present; however, after light rail vehicles exit the stop, pedestrians can typically continue without substantial delay.

Some pedestrian/vehicle conflicts were observed at the campus driveways on Castro Street, Duboce Avenue, and 14th Street; however, vehicle traffic entering and exiting the campus did not substantially affect pedestrians or traffic on adjacent streets.

St. Luke's Campus

The northern half of the St. Luke's Campus slopes downward from west to east near Guerrero Street toward San Jose Avenue and Valencia Street, and slopes downward to the north from 27th Street to Cesar Chavez Street. There is an approximately 7-foot change in grade in the site vicinity between Guerrero Street (west) and Valencia Street (east) and an approximately 9-foot grade change from 27th Street (south) to Cesar Chavez Street (north).

Sidewalks in the vicinity of the St. Luke's Campus range from 9 to 14 feet wide. Pedestrian crosswalks are provided at most intersections in the campus vicinity, except at the unsignalized intersection of 27th Street/San Jose Avenue, which does not have a crosswalk. The signalized study intersections have pedestrian signals for all street approaches.

The main pedestrian entrance to the St. Luke's Campus is located on Valencia Street south of Cesar Chavez Street. Pedestrian traffic in the vicinity of the St. Luke's Campus is associated primarily with the existing St. Luke's Hospital operations and pedestrians walking to and from the Muni bus stops located on the northeast and southwest corners of Valencia and Cesar Chavez Streets. The current ingress and egress locations for the on-site parking lots are on Valencia Street (between Cesar Chavez and Duncan Streets), San Jose Avenue (between 27th and Duncan Streets), 27th Street (between Guerrero Street and San Jose Avenue) and Cesar Chavez Street (between Guerrero and Valencia Streets).

Pedestrian conditions in the vicinity of the St. Luke's Campus were observed during field surveys in November and December 2009. Overall, pedestrian volumes in the campus vicinity are low to moderate (50–200 pedestrians per hour). In general, sidewalks and crosswalks were observed to operate at free-flow conditions, with pedestrians moving at normal walking speeds and having the freedom to bypass other pedestrians. No pedestrian safety issues were observed at crosswalks in the immediate project vicinity.

Parking

Existing parking supply and occupancy conditions in the vicinity of the five existing and proposed CPMC campuses were based on field surveys conducted in 2006 and 2008. Field surveys at the St. Luke's Campus were conducted in 2008 and 2009.

The Cathedral Hill Campus, Pacific Campus, California Campus, and Davies Campus are located within Residential Permit Parking (RPP) areas, which restrict vehicles without a permit to posted parking time limits generally between 1 and 4 hours. Vehicles displaying RPP permits, which are available to residents and on a limited basis to businesses in the area, are not subject to the parking restrictions.[12]

Cathedral Hill Campus

On-street and off-street parking conditions were assessed for the parking study area (Figure 4.5-1, page 4.5-2) bounded by Pine Street to the north, Hyde Street to the east, Eddy Street to the south, and Laguna Street to the west. The Cathedral Hill Campus is in the vicinity of a residential area west of Van Ness Avenue, and a commercial area east of Van Ness Avenue. Although the Cathedral Hill Campus site does not lie within a RPP zone, three residential permit parking areas exist in the vicinity of the proposed campus:

- **Permit Area "C"** is bounded by Broadway to the north, Kearny Street to the east, Sutter Street to the south, and Polk Street to the west. In the vicinity of the proposed campus, vehicles without a permit are restricted to 2-hour parking between 9 a.m. and 9 p.m. on weekdays.

- **Permit Area "G"** is bounded by Broadway to the north, Polk Street to the east, Post Street to the south, and Presidio Avenue to the west. In the vicinity of the proposed campus, vehicles without a permit are restricted to 2-hour parking between 8 a.m. and 6 p.m. on weekdays.

- **Permit Area "R"** is bounded by Geary Street to the north, Gough Street and Franklin Street to the east, Turk Street and Ivy Street to the south, and Webster Street and Laguna Street to the west. In the vicinity of the proposed campus, vehicles without a permit are restricted to 2-hour parking between 9 a.m. and 6 p.m. on weekdays.

On-street parking regulations on the streets adjacent to the proposed Cathedral Hill Campus are as follows:

- On the south side of Post Street between Van Ness Avenue and Franklin Street, there are five metered parking spaces and five metered commercial-vehicle loading spaces.

- On the north side of Geary Street between Van Ness Avenue and Franklin Street, there are six metered parking spaces and two commercial-vehicle loading spaces.

- On the north side of Geary Street between Polk Street and Van Ness Avenue, there are five metered parking spaces, three metered commercial-vehicle loading spaces, and a midblock bus stop.

- On the south side of Cedar Street between Polk Street and Van Ness Avenue, there are 10 metered parking spaces.

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[12] Businesses located within an RPP area are permitted to apply for one permit per business (and up to three additional permits for delivery vehicles with commercial license plates registered to the business address). Under certain circumstances SFMTA may also issue permits for caregivers, company vehicles, carpools/vanpools, contractors, fire stations, foreign consulates, military personnel, and teachers.

- On the east side of Franklin Street between Post and Geary Streets, there are 11 metered parking spaces.
- On the west side of Van Ness Avenue between Post and Geary Streets, there are three metered parking spaces.
- On the east side of Van Ness Avenue between Cedar and Geary Streets, there are two metered loading spaces.

On-street parking supply and hourly-occupancy surveys for the period between 1 and 8 p.m. were conducted in April 2008. As part of the surveys, the number of vehicles displaying appropriate RPP permits were inventoried. Parking duration and turnover surveys were conducted to determine how on-street parking spaces are utilized. Within the study area there are about 2,500 on-street parking spaces**.** During the 1 to 8 p.m. survey period, parking occupancy was observed to range between 57 percent (at about 4 p.m.) and 77 percent (at about 7 p.m.). The blocks in the northwest portion of the study area (generally bounded by Laguna Street, Pine Street, Gough Street, and Post Street) had the highest parking occupancy throughout the day. This area also had the most vehicles displaying RPP permits, which ranged between 17 and 23 percent of all vehicles, and with the highest percentage between 3 and 6 p.m. Very few vehicles with RPP permits were observed parked within the study area east of Van Ness Avenue.

The on-street parking spaces in the Cathedral Hill Campus parking study area experienced low turnover and extended parking duration for the 1-hour metered and unmetered parking spaces. Vehicles parked in 2-hour metered and time-limited spaces had higher turnover and a parking duration of about 2 hours. Vehicles displaying RPP permits had the lowest turnover and longest duration of stay of all vehicles parked within the permit area (generally between 4 and 5 hours).

There are 14 off-street public parking facilities (10 garages and four surface lots) within the Cathedral Hill Campus parking study area, providing a total of 1,800 parking spaces. Two of the public parking facilities are managed by CPMC, including the 1133 Van Ness Avenue Garage (405 spaces) and the 855 Geary Street parking lot (150 spaces). Parking occupancy at these facilities is greatest during the midday period, and gradually decreases to less than 50 percent occupancy during the evening period.

Pacific Campus

On-street and off-street parking conditions were assessed for the parking study area (Figure 4.5-2, page 4.5-3) bounded by Pacific Avenue to the north, Gough Street to the east, Bush Street to the south, and Steiner Street to the west. The Pacific Campus site is within the “G” RPP area, which is generally bounded by Broadway to the north, Post Street to the south, Polk Street to the east, and Presidio Avenue to the west.

On-street parking regulations on the streets adjacent to the Pacific Campus are as follows:

- On the south side of Washington Street between Webster and Buchanan Streets, there are 15 RPP parking spaces.
- On the south side of Clay Street between Fillmore and Webster Streets, there are 17 metered parking spaces.
- On the north side of Sacramento Street between Fillmore and Webster Streets, there are 12 metered parking spaces and one commercial-vehicle loading space.
- On the north side of Sacramento Street between Webster and Buchanan Streets there are 14 unrestricted parking spaces, and one commercial vehicle loading space.
- On the east side of Webster Street between Washington and Sacramento Streets, there are four metered spaces, six RPP spaces, and a passenger loading/unloading zone.
- On the west side of Buchanan Street between Washington and Sacramento Streets, there are 10 RPP spaces, seven unrestricted spaces, and a passenger loading/unloading zone.

On-street parking supply and hourly-occupancy surveys were conducted for the period between 1 and 8 p.m. in October 2008. Within the Pacific Campus study area, there are about 2,000 on-street parking spaces. Of these, about 1,730 are 2-hour RPP spaces, about are 230 metered spaces (20-minute, 1-hour, and 2-hour spaces), and the remainder comprise commercial-vehicle spaces and passenger loading zones. During the 1 p.m. to 8 p.m. survey period, on-street parking occupancy was observed to range between 89 and 93 percent. Most blocks immediately adjacent to the Pacific Campus had a parking occupancy of at least 80 percent during the 1 p.m. to 8 p.m. survey period, and several blocks had an occupancy of 100 percent during the peak 3 p.m. to 4 p.m. period. In general, although parking occupancy on the blocks immediately adjacent to the Pacific Campus peaked in the mid-afternoon, the overall parking occupancy was greatest in the evening—generally between 6 and 8 p.m. This later peak parking period reflects the residential parking demand, which is greatest during the evening and overnight hours, and the commercial demand associated with evening restaurant and entertainment uses along the Fillmore Street corridor.

The “G” RPP regulations restrict vehicles without a permit to 2-hour parking between 8 a.m. and 6 p.m. on weekdays. The number of vehicles observed with a RPP permit ranged between 42 and 45 percent, with greater RPP use on blocks without adjacent CPMC or commercial uses.

There are eight off-street parking facilities (five garages and three surface lots) in the Pacific Campus study area providing both permit and public parking spaces, and containing a total of 1,505 parking spaces. Four of the seven facilities are managed by CPMC.

Of the 1,505 off-street spaces, 1,095 are dedicated to CPMC employees and physicians, and about 410 are available to the general public, including CPMC patients and visitors. Of the 1,095 spaces dedicated to CPMC employees and physicians, 400 spaces are located at the Japan Center Garage, and which could be accessed via the CPMC shuttle system. Parking occupancy at the off-street facilities is high throughout the day, and peaks in the midday hours between 2 and 4 p.m.

California Campus

On-street and off-street parking conditions were assessed for the parking study area (Figure 4.5-3, page 4.5-4) bounded by West Pacific Avenue to the north, Laurel Street to the east, Euclid Avenue to the south, and Arguello Boulevard to the west. The California Campus site is within the “F” RPP area, which is generally bounded by West Pacific Avenue to the north, Geary Street and California Street to the south, Presidio Avenue and Spruce Street to the east, and Arguello Boulevard to the west.

On-street parking regulations on the streets adjacent to the California Campus are as follows:

- On the south side of Sacramento Street between Cherry and Spruce Streets, there are 17 RPP spaces, four 10-minute spaces, eight 2-hour time-limited spaces, and a shuttle zone and a passenger loading/unloading zone.
- On the north side of California Street between Palm and Spruce Streets, there are 24 metered spaces, one handicapped-accessible space, and a passenger loading/unloading zone.
- On the west side of Cherry Street between California and Sacramento Streets, there are 11 unrestricted parking spaces.
- On the east side of Cherry Street between California and Sacramento Streets, there are 10 unrestricted spaces and a passenger loading/unloading zone.
- On the west side of Maple Street between California and Sacramento Streets, there are 25 RPP parking spaces.
- On the east side of Maple Street between California and Sacramento Streets, there are 11 RPP parking spaces.

On-street parking supply and hourly-occupancy surveys were conducted for the period between 1 and 8 p.m. in September 2006. Within the California Campus study area, there are about 1,907 on-street parking spaces. Of these, about 1,577 are 2-hour and 3-hour RPP spaces, about 184 are metered spaces (15-minute, 1-hour, and 2-hour spaces), 121 are unrestricted spaces, and the remainder comprise commercial-vehicle spaces and passenger loading zones. During the 1 p.m. to 8 p.m. survey period, on-street parking occupancy was observed to range between 65 and 86 percent. The blocks closest to California Street and Geary Street had the highest observed occupancy throughout the day, with average occupancy 75 percent or greater throughout the survey period.

Most blocks immediately adjacent to the California Campus had a parking occupancy of at least 70 percent during the 1 to 8 p.m. survey period, and several blocks had an occupancy greater than 85 percent during the peak 1 p.m. to 3 p.m. period.

There are eight off-street parking facilities (five garages and three surface lots) in the California Campus study area providing both permit and public parking spaces, and containing a total of 698 parking spaces. Six of the eight facilities are managed by CPMC. Of the 698 off-street spaces, 31 are dedicated to CPMC employees and physicians, and the remainders are available to the general public, including CPMC patients and visitors. CPMC also leases 700 parking spaces at the Geary Mall garage located on Geary Street at 17th Avenue, which could be accessed via the CPMC shuttle system.

Parking occupancy at the off-street facilities averages about 83 percent occupied between 1 and 5 p.m., with a peak in the midday hours between 1 and 3 p.m. Parking occupancy between 5 and 8 p.m. drops to about 40 percent.

Davies Campus

On-street and off-street parking conditions were assessed for the parking study area (Figure 4.5-4, page 4.5-5) bounded by Page Street to the north, Church Street and Fillmore Street to the east, 16th Street and Market Street to the south, and Buena Vista Avenue and Broderick Street to the west. The Davies Campus site is within the “S” RPP area, which is generally bounded by Haight Street to the north, Valencia Street and Gough Street to the east, 22nd Street to the south, and Buena Vista Avenue to the west.

On-street parking regulations on the streets adjacent to the Davies Campus are as follows:

- On the south side of Duboce Avenue between Castro and Noe Streets, there are 22 unrestricted parking spaces and a handicapped-accessible space.
- On the north side of 14th Street between Castro and Noe Streets, there are 27 unrestricted parking spaces.
- On the east side of Castro Street between Duboce Avenue and 14th Street, there are 18 unrestricted parking spaces.

- On the west side of Noe Street between Duboce Avenue and 14th Street, there are 47 RPP parking spaces.

On-street parking supply and hourly-occupancy surveys were conducted for the period between 1 and 8 p.m. in August 2006. Within the Davies Campus study area, there are about 2,000 on-street parking spaces. Of these, about 1,830 are RPP spaces and about 332 are unrestricted spaces, and the remainder comprises short-term metered spaces, commercial-vehicle spaces, and passenger loading zones. During the 1 p.m. to 8 p.m. survey period, on-street parking occupancy was observed to range between 77 and 88 percent. The overall parking occupancy between 1 and 5 p.m. was about 78 percent, and between 5 and 8 p.m. was slightly higher at about 87 percent. The blocks immediately adjacent to the Davies Campus had a parking occupancy of at least 99 percent between 1 and 5 p.m., and 94 percent between 5 and 8 p.m.

There are five off-street parking facilities (two garages and three surface lots) in the Davies Campus study area providing both permit and public parking spaces, and containing a total of 486 parking spaces. Four facilities are managed by CPMC. Parking occupancy at the off-street facilities ranges between 73 and 87 percent between 1 and 5 p.m., and decreases after 5 p.m.

St. Luke's Campus

On-street and off-street parking conditions were assessed for the parking study area (Figure 4.5-5, page 4.5-6) bounded by 24th Street to the north, South Van Ness Avenue to the east, 29th Street/Fair Avenue/Mirabel Avenue to the south, and Dolores Street to the west. The St. Luke's Campus parking study area lies partially to the north and west within "I" and "Z" RPP areas, which are bounded by 17th Street to the north, Folsom Street to the east, 28th Street to the south, and Noe Street to the west. The RPP restrictions in the vicinity of the St. Luke's Campus are in effect from 8 a.m. to 6 p.m. on weekdays and restrict parking for vehicles without a permit to a 2-hour duration.

On-street parking regulations on the streets adjacent to the St. Luke's Campus project site are as follows:

- On the south side of Cesar Chavez Street between San Jose Avenue and Valencia Street, there are 10 unregulated parking spaces.

- On the west side of Valencia Street between Cesar Chavez and Duncan Streets, there are three metered spaces and a passenger zone accommodating two vehicles.

- On the north side of Duncan Street between San Jose Avenue and Valencia Street, there are eight metered spaces and eight unrestricted spaces.

- On the east and west sides of San Jose Avenue between 27th and Cesar Chavez Streets, there are 28 permit-only spaces. This public street has been used for parking by the medical center since 1968, pursuant to an encroachment permit.

On-street parking supply and hourly-occupancy surveys were conducted for the period between 1 and 8 p.m. in October 2006 and October 2009. Within the parking study area, there are about 1,825 on-street parking spaces. During the 1 p.m. to 8 p.m. survey period, on-street parking occupancy was observed to range between 78 and 89 percent. The blocks immediately adjacent to the St. Luke's Campus had a parking occupancy of 70 to 100 percent during the survey period, with the greatest occupancy between 3 and 4 p.m.

There are three off-street parking facilities (two garages and one surface lot) in the study area providing both permit and public parking spaces, and containing a total of 329 parking spaces. All three facilities are managed by CPMC. Parking occupancy at the off-street facilities ranges between 62 and 73 percent between 1 and 5 p.m., and decreases after 5 p.m.

4.5.2 REGULATORY FRAMEWORK

These plans and policies are relevant to transportation and circulation and are included in the General Plan, the *San Francisco Better Streets Plan*, the *San Francisco Bicycle Plan*, and the Transit-First Policy. Please refer to Chapter 3, "Plans and Policies," for a discussion of these plans and their respective applications to the implementation of the proposed LRDP. No federal, state, or regional transportation regulations are applicable to the CPMC LRDP other than with respect to the Caltrans ROW for the pedestrian tunnel underneath Van Ness Avenue near the proposed Cathedral Hill Campus.

CITY/LOCAL

San Francisco General Plan

The Transportation Element of the General Plan is composed of objectives and policies that relate to the nine aspects of the citywide transportation system: General Regional Transportation, Congestion Management, Vehicle Circulation, Transit, Pedestrian, Bicycles, Citywide Parking, and Goods Management. Consistency of the *San Francisco General Plan* is addressed in Chapter 3, "Plans and Policies."

San Francisco Bicycle Plan

The *San Francisco Bicycle Plan* describes a City program to provide the safe and attractive environment needed to promote bicycling as a transportation mode. The *San Francisco Bicycle Plan*'s improvements in the vicinity of the campuses are presented in "Approach to Analysis," under "Future Transportation Improvements" on pages 4.5-61 through 4.5-68. Project consistency with this plan is addressed in Chapter 3, "Plans and Policies."

Transit-First Policy

In 1998, the San Francisco voters amended the City Charter (Charter Article 8A, Section 8A.115) to include a Transit-First Policy. The Transit-First Policy is a set of principles that underscore the City's commitment that travel by transit, bicycle, and on foot be given priority over travel by the private automobile. These principles are embodied in the policies and objectives of the Transportation Element of the General Plan and are addressed in Chapter 3, "Plans and Policies."

4.5.3 Significance Criteria

These criteria are organized by mode to facilitate the transportation impact analysis; however, the transportation significance thresholds are essentially the same as the ones in the environmental checklist (Appendix G of the State CEQA Guidelines), which has been adopted and modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the proposed project would result in a significant impact to transportation and circulation.

- **Traffic**—In San Francisco, the threshold for a significant adverse impact on traffic has been established as deterioration in the LOS at a signalized intersection from LOS D or better to LOS E or LOS F, or from LOS E to LOS F.[13] The operational impacts on unsignalized intersections are considered potentially significant if project-related traffic would cause the level of service at the worst approach to deteriorate from LOS D or better to LOS E or LOS F and California Department of Transportation (Caltrans) signal warrants would be met, or if the project would cause Caltrans signal warrants to be met when the worst approach is already at LOS E or LOS F. For an intersection that operates at LOS E or LOS F under existing conditions, there may be a significant adverse impact depending on the magnitude of the project's contribution to the worsening of delay. In addition, a project would have a significant adverse impact if it would cause major traffic hazards, or would contribute considerably to the cumulative traffic increases that would cause the deterioration in LOS to unacceptable levels (i.e., to LOS E or LOS F).

- **Transit—**The project would have a significant effect on the environment if it would cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity, resulting in unacceptable levels of transit service; or cause a substantial increase in delays or operating costs such that significant adverse impacts on transit service levels could result.

[13] Level of service (LOS) is a qualitative description of a facility's performance based on average delay per vehicle, vehicle density, or volume-to-capacity ratios. Levels of service range from LOS A, which indicates free-flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays.

- **Bicycles**—The project would have a significant effect on the environment if it would create potentially hazardous conditions for bicycles or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.

- **Pedestrians**—The project would have a significant effect on the environment if it would result in substantial overcrowding on public sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.

- **Loading**—The project would have a significant effect on the environment if it would result in a loading demand during the peak hour of loading activities that could not be accommodated within the proposed on-site loading facilities or within convenient on-street loading zones, and create potentially hazardous conditions or significant delays affecting traffic, transit, bicycles, or pedestrians.

- **Emergency Vehicle Access**—The project would have a significant impact on the environment if it would result in inadequate emergency vehicle access.

- **Construction**—Construction-related impacts generally would not be considered significant due to their temporary and limited duration. However, in circumstances involving large development plans where construction would occur over long periods of time, construction-related impacts may be considered significant.

METHODOLOGY

This section presents the methodology for developing Modified Baseline and Cumulative conditions, and information considered in the travel demand and impact analysis in the following order.

1. Approach to impact analysis, including analysis years.

2. Analysis methodologies for intersection operations, transit capacity utilization, transit delay, and pedestrian crosswalk analyses.

3. Planned transportation improvements assumed to be implemented by the City of San Francisco, and included in the impact assessment.

4. Methodology for development of Modified Baseline and Cumulative No Project traffic and transit forecasts.

5. Methodology and results of the project travel demand forecasts for the campus programs.

Approach to Impact Analysis

The impact analysis for each campus was conducted for either future year 2015 or 2020 Modified Baseline conditions, as well as for future year 2030 Cumulative conditions. Projects in San Francisco are typically analyzed under an "existing plus project" scenario in which the project's travel demand is layered onto existing transportation conditions. However, because of the scale and construction timeframe of the projects included in the CPMC LRDP, a Modified Baseline scenario was developed to present a more accurate representation of the transportation system at the time when implementation of the CPMC LRDP is anticipated for each CPMC campus.

Use of a modified baseline better describes the environmental setting at the time that LRDP is actually implemented at each campus, as the Modified Baseline takes into consideration reasonably anticipated growth in vehicular traffic, due to increases in population, housing units and employment as forecasted by ABAG and the Planning Department, taking into consideration existing zoning, approved area plans, an area's potential zoning capacity and anticipated redevelopment. Additional details on travel demand forecasting for the proposed LRDP is documented in Assessment of No Project Cumulative Traffic Conditions near Five CPMC Campus Sites in San Francisco - Year 2015 and 2030 Traffic Volume Estimates, April 2010, prepared by Adavant Consulting.

For the Cathedral Hill Campus and the St. Luke's Campus, a Modified Baseline year of 2015 was chosen to represent when all or the most substantial portion of the new construction work at each campus is anticipated to be completed and those buildings would be occupied. For the Pacific and Davies Campuses, 2020 was chosen as the Modified Baseline year for the same reasons. For the California Campus, a Modified Baseline year of 2015 was chosen to reflect conditions when the majority of the Women's and Children's inpatient and outpatient activity would be relocated to the Cathedral Hill and Pacific campuses, and use of the California Campus after 2015 would decrease until 2020, when only a limited amount of ancillary activities would remain at the California Campus.

The purpose of the Modified Baseline is to better describe the environmental setting at the time that the project is actually implemented. CEQA does not mandate a uniform or inflexible requirement for describing the project baseline. Rather, it allows flexibility from the typical baseline in cases, such as this, where the timing of master plan development and review, and the nature and timing of construction, indicate that a better view will be provided by analyzing the project at the time it becomes operational, rather than against a prior point in time.

Project impacts were assessed by comparing Modified Baseline plus Project conditions to Modified Baseline No Project conditions for the appropriate analysis year—either 2015 or 2020, as noted above. Similarly, for 2030 Cumulative conditions, project impacts were assessed by comparing 2030 Cumulative plus Project conditions to 2030 Cumulative No Project conditions. Year 2030 was selected as the future cumulative analysis year because the San Francisco County Transportation Authority (SFCTA) travel demand model (SF-CHAMP) provides traffic and transit forecasts for cumulative development and growth through the year 2030.

Analysis Methodology

Intersection LOS Methodology

The operating characteristics of signalized intersections are described by the concept of LOS. LOS is a qualitative description of an intersection's performance based on the average delay per vehicle. Intersection levels of service range from LOS A, which indicates free flow or excellent conditions with short delays, to LOS F, which indicates congested or overloaded conditions with extremely long delays. LOS levels A–D are considered excellent to satisfactory service levels, LOS E is undesirable, and LOS F conditions are unacceptable. In San Francisco, operating conditions of LOS D or better are considered acceptable. Table 4.5-9 presents the level of service descriptions and associated delays for signalized and unsignalized intersections.

The study intersections were evaluated using the 2000 *Highway Capacity Manual* (2000 HCM) methodology. For signalized intersections, this methodology uses various intersection characteristics (e.g., traffic volumes, lane geometry, and signal phasing and timing) to estimate the capacity for each lane group approaching the intersection, and to calculate the average control delay experienced by motorists traveling through the intersection. The LOS is based on average delay (in seconds per vehicle) for the various movements within the intersection. A combined weighted average delay and LOS is presented for the intersection. For unsignalized intersections, average delay and LOS operating conditions are calculated by approach (e.g., northbound) and movement (e.g., northbound left-turn), for those movements that are subject to delay. For the purpose of this analysis, the operating conditions (LOS and delay) for unsignalized intersections are presented for the worst approach (i.e., the approach with the highest average delay per vehicle).

The project was determined to have a significant traffic impact at an intersection if project-generated trips would cause an intersection operating at LOS D or better under No Project conditions to operate at LOS E or LOS F, or intersections operating at LOS E under No Project conditions to deteriorate to LOS F conditions. At intersections that would operate at LOS E or LOS F under No Project conditions, and would continue to operate at LOS E or LOS F under project conditions, the increase in project vehicle trips was reviewed at the critical movements to determine whether the increase would contribute considerably to critical movements operating at LOS E or LOS F.[14]

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[14] At an intersection, the critical traffic movements operate with the highest volume-to-capacity ratio. In other words, the critical movements are the most congested movements.

Table 4.5-9
Level of Service Definitions for Signalized and Unsignalized Intersections

Control/LOS	Description of Operations	Average Control Delay (seconds per vehicle)
Signalized		
A	Insignificant Delays: No approach phase is fully used and no vehicle waits longer than one red indication.	≤ 10
B	Minimal Delays: An occasional approach phase is fully used. Drivers begin to feel restricted.	> 10.0 and ≤ 20.0
C	Acceptable Delays: Major approach phase may become fully used. Most drivers feel somewhat restricted.	> 20.0 and ≤ 35.0
D	Tolerable Delays: Drivers may wait through no more than one red indication. Queues may develop but dissipate rapidly without excessive delays.	> 35.0 and ≤ 55.0
E	Significant Delays: Volumes approaching capacity. Vehicles may wait through several signal cycles and long queues form upstream.	> 55 and ≤ 80
F	Excessive Delays: Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections.	> 80.0
Unsignalized		
A	No delay for STOP-controlled approach.	≤ 10.0
B	Operations with minor delays.	> 10.0 and ≤ 15.0
C	Operations with moderate delays.	> 15 and ≤ 25.0
D	Operations with some delays.	> 25.0 and ≤ 35.0
E	Operations with high delays and long queues.	> 35.0 and ≤ 50.0
F	Operations with extreme congestion, with very high delays and long queues unacceptable to most drivers.	> 50.0

Note: LOS = level of service
Source: Transportation Research Board. 2000. *Highway Capacity Manual—Special Report*. Washington, DC.

The project was also determined to have a significant cumulative impact if project-generated trips would cause an intersection operating at LOS D or better under 2030 Cumulative conditions to operate at LOS E or LOS F under the 2030 Cumulative plus Project conditions. The project was also determined to have a significant cumulative impact if the LOS deteriorated from LOS E to LOS F between 2030 Cumulative conditions and 2030 Cumulative plus Project conditions. Additionally, as with project-specific impacts, at intersections that would operate at LOS E or LOS F under 2030 Cumulative conditions, and would continue to operate at unacceptable conditions, the increase in project vehicle trips were reviewed at the critical movements to determine whether the increase would contribute considerably to those critical movements. For 2030 Cumulative plus Project conditions, if it was determined that a project would have a significant project-specific traffic impact at an intersection, then the impact would also be considered a significant cumulative impact.

Transit Capacity Utilization Analysis Methodology

The impact of additional transit ridership generated by the CPMC LRDP was assessed by comparing the projected ridership to the available capacity. Transit "capacity utilization" refers to transit riders as a percentage of the capacity of the transit line, or group of lines combined and analyzed as cordons across which the transit lines travel. For each campus, the transit capacity utilization analysis was conducted for the north/south and east/west lines serving the campus.

The number of existing transit riders for each line was obtained from Muni's monitoring data for existing conditions, and adjusted for the Modified Baseline (future year 2015 or 2020) No Project and for the 2030 Cumulative No Project conditions based on the information on existing and future transit ridership obtained from the SF-CHAMP travel demand model. The existing service capacity of each line was estimated by multiplying the passenger capacity of each transit vehicle by the number of scheduled bus, light rail, or cable car trips. The modified Baseline and 2030 Cumulative capacity for each line was estimated by multiplying the passenger capacity for each transit vehicle by the number of buses, light rail, or cable car trips that are projected to occur under the proposed TEP headways. The capacity includes seated passengers and an appreciable number of standing passengers per vehicle (the number of passengers is between 30 and 80 percent of the seated passengers depending upon the specific transit vehicle configuration). The maximum loads, include both seated and standing passengers, vary by vehicle type and are 45 passengers for a 30-foot bus, 63 passengers for a 40-foot bus, 94 passengers for a 60-foot bus, and 119 passengers for a light-rail vehicle. The percent utilization of capacity was then calculated by comparing the ridership demand to the capacity provided. Muni has established a capacity utilization standard of 85 percent.

Muni capacity utilization corridors were established for each campus, which include the lines serving the vicinity of the campus. The corridors for each campus are:

Cathedral Hill Campus

- **North/South Lines:** 12-Folsom-Pacific, 19-Polk, 27-Bryant, 47-Van Ness, 49-Van Ness-Mission
- **East/West Lines:** 1-California, 2-Clement, 3-Jackson, 5-Fulton, 16AX-Noriega A Express, 16BX-Noriega B Express, 31-Balboa, 38-Geary, 38L-Geary Limited

Pacific Campus

- **North/South Lines:** 22-Fillmore, 24-Divisadero
- **East/West Lines:** 1-California, 2-Clement, 3-Jackson, 4-Sutter, 12-Folsom-Pacific, 38-Geary, 38L-Geary Limited

California Campus

- **North/South Lines:** 33-Stanyan, 43-Masonic, 44-O'Shaughnessey

- **East/West Lines:** 1-California, 1AX-California A Express, 1BX-California B Express, 2-Clement, 38-Geary, 38L-Geary Limited, 38BX-Geary B Express

Davies Campus

- **North/South Lines:** 22-Fillmore, 24-Divisadero, J-Church

- **East/West Lines:** 6-Parnassus, 37-Corbett, 71-Haight-Noriega, F-Market & Wharves, K-Ingleside, L-Taraval, M-Ocean View, N-Judah

St. Luke's Campus

- **North/South Lines:** 12-Folsom-Pacific, 14-Mission, 14L-Mission Limited, 48-Van Ness-Mission, 67-Bernal Heights, J-Church

- **East/West Lines:** 27-Bryant, 48-Quintara-24th Street

Transit Delay Methodology

Impacts on transit lines were also measured in terms of increases to transit travel times. The analysis evaluated the increases to transit travel times associated with the following three influencing factors:[15]

- **Traffic congestion delay**—Traffic congestion associated with increases in area traffic slows down transit vehicles and results in increased transit travel times. Traffic congestion delays are calculated by summing the average vehicular delay at each intersection along the transit line's route within the study area. The increase in total route segment delay is equal to the increase in travel time associated with the project.

- **Transit reentry delay**—Transit vehicles typically experience delays after stopping to pick up and drop off passengers while waiting for gaps in adjacent street traffic in order to pull out of bus stops. As traffic volumes on the adjacent street increase, reentering the flow of traffic becomes more difficult and transit vehicles experience increased delay. Transit reentry delay was calculated using empirical data presented in the 2000 HCM. Total transit reentry delay for each route was calculated as the sum of transit reentry delay at each stop within the study area.

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[15] The methodology used is similar to that used in the San Francisco Bicycle Plan Final EIR, San Francisco Planning Department, August 2009, except that methodology included the additional transit delay associated with substantial increases in bicycle volumes, which was appropriate for a project contemplating large-scale changes to the City's bicycle network. As indicated in "Project Travel Demand," the LRDP project would not be expected to generate a substantial number of bicycle trips, therefore, the "bicycle delay" component was not included. However, instead, this evaluation includes the added delay associated with increases in passenger boardings, which is more appropriate for this project.

- **Passenger boarding delay**—Although increases in transit ridership are generally viewed positively, the amount of time a transit vehicle has to stop to pick up and drop off passengers (i.e., the transit vehicle dwell time) is directly correlated to the number of passengers boarding the vehicle. As general transit ridership grows, vehicles would have to spend more time at stops, which may increase overall transit travel times. Passenger boarding delay was calculated assuming 2 seconds per passenger boarding or alighting. Passenger boardings within the study area were estimated using the transit assignment by line.

This analysis assumes that the proposed Van Ness Avenue and Geary Corridor Bus Rapid Transit (BRT) projects are not in place and bus routes operate within mixed flow travel lanes, as they do today because the BRT projects are still undergoing environmental review and have not been approved. Because the 2-Clement, 3-Jackson, and 38-Geary transit lines already operate in bus-only lanes and any increases in vehicular delay would have minimal impact in their travel times, only passenger boarding delay was added to the No Project scenario to gauge the impact of the project on these lines.

The project was determined to have a significant transit impact if project-generated transit trips would cause a downtown screenline, operating at less than its capacity utilization standard under No Project conditions, to operate at more than capacity utilization conditions (i.e., at more than 85 percent capacity utilization). For the proposed Cathedral Hill Campus, the project was determined to have a significant impact if it would increase transit travel times so that additional transit vehicles would be required to maintain the proposed headways.[16] This was assumed to be the case if either the project's travel time increases to a particular route would be greater than half the proposed headway or the number of required vehicles estimated using SFMTA's cost/scheduling model, would increase by one or more vehicles with the addition of the project travel demand. The project would have a significant contribution to a cumulative transit impact if it was determined to have a significant project impact.

Pedestrian Crosswalk LOS Methodology

The level of service for the study crosswalks were calculated using the methodology presented in the 2000 HCM. Crosswalk LOS levels are measures of the amount of space (square feet) each pedestrian has in the crosswalk. These measurements depend on pedestrian volumes, signal timing, corner dimensions, crosswalk dimensions and roadway widths. LOS A represents free-flowing pedestrian conditions, while LOS F indicates that there are substantial restrictions to pedestrian movement and speed.

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[16] The transit delay analysis was only conducted for the Cathedral Hill campus because it would be a new medical campus and due to the size of the development, its location and potential adverse impacts on adjacent intersections.

Future Transportation Improvements

The analysis assumes completion of certain planned and reasonably foreseeable transit and bicycle network improvements as described below, that, although not part of the CPMC LRDP, could affect circulation and transit capacity. These improvements would be completed by the City and County of San Francisco directly.

Cesar Chavez Street Streetscape Plan

The Cesar Chavez Streetscape Plan is a detailed design effort to re-envision Cesar Chavez Street between Hampshire and Guerrero Streets in the Mission District. The Cesar Chavez Streetscape Plan consists generally of a widened median with trees and landscaping, large corner curb extensions, improved pedestrian crossings, and dedicated left turn pockets for vehicles. These improvements would likely include the removal of one travel lane (from three to two) in each direction and accommodate a 5-foot wide bicycle lane in each direction. The intersection LOS analysis for the St. Luke’s Campus assumed implementation of the project, including one less travel lane and additional bicycle lanes, as part of the 2015 Modified Baseline and 2030 Cumulative conditions.

SF Muni Transit Effectiveness Project

SFMTA and the City Controller’s Office are in the process of implementing the TEP, a review of the City’s public transit system with recommendations designed to make Muni service more reliable, quicker and more frequent. The TEP proposals were endorsed by the SFMTA Board of Directors in October 2008. The TEP proposed the following potential changes to transit lines within the study area:

1-California:

- More frequent service proposed during peak hours between Presidio Avenue and 33rd Avenue
- All service would terminate north of Market Street at Clay Street/Drumm Street (currently some weekday daytime service extends to Main Street/Howard Street)
- Would simplify peak period short-line service by turning all short-lines at Presidio Avenue (some buses currently terminate at Fillmore Street and 6th Avenue)
- Decreased frequency from 2.5-minute headways to 3-minute headways during the p.m. peak period

1BX-California B Express:

- Increased frequency (6 minute a.m. peak and 12 minute p.m. peak headways)
- New stop at Van Ness Avenue
- Service would begin at 4th Avenue

2-Clement:

- Service west of 14th Avenue would be discontinued due to low ridership and access to high-quality service nearby (1-California and 38-Geary)
- In combination with 4-Sutter, would provide frequent service east of Presidio Avenue

3-Jackson:

- Line discontinued, with service on Sutter Street maintained with a more frequent 4-Sutter
- Lines 2-Clement, 12-Folsom-Pacific, 22-Fillmore, 24-Divisadero, and 43-Masonic would continue to offer service along majority of existing route

4-Sutter:

- Would run all day to maintain frequent service on Sutter Street
- Line discontinued west of Presidio and California, but segment would continue to be served by the 1-California and 2-Clement

5-Fulton:

- Two service types proposed for peak periods
- Long-line “5L” would make local stops west of 6th Avenue and limited stops between 6th Avenue and Van Ness Avenue, decreasing travel time for most passengers
- Short-line “5” from 6th Avenue to Downtown would provide additional, local service in Western Addition to address high peak ridership and crowding
- Nonpeak service would make all local stops from the ocean to Downtown
- Would go to downtown at all times, rather than turning back at Civic Center in the evening

6-Parnassas:

- Extended to West Portal Station

7-Haight:

- Service eliminated and replaced by increased service on other Haight Street buses (including 6-Parnassus and 71L-Haight-Noriega Limited)

12-Folsom-Pacific:

- Would provide frequent, direct connections from Pacific Avenue to Financial District via Sansome Street

- Would eliminate indirect segment along The Embarcadero
- Would provide direct connections from Downtown to South of Market, Caltrain, Potrero Hill, and San Francisco General Hospital via Second Street, Townsend Street, Mission Bay, Connecticut Street, Wisconsin Street, Dakota Street, 25th Street
- Short line would operate between Van Ness Avenue/Pacific Avenue and the Montgomery Station
- Service on Folsom Street would be replaced by revised 27-Bryant and new 11-Downtown Connector

14-Mission:

- Would be extended to Daly City BART station from its current terminus on Mission Street and San Jose Avenue
- Mission Street would have more frequent service at all times of day provided by the local (14-Mission) and limited stop service (14L-Mission Limited and 49L-Van Ness-Mission Limited lines)

16X-Noriega Express:

- Would be extended to Market Street and Spear Streets in the Financial District (currently terminates at 4th Street)

19-Polk:

- Would operate between Van Ness Avenue/North Point Street and SF General Hospital
- Would have modified route in Civic Center to simplify route structure and reduce travel time
- Segment south of 24th Street would be served by revised 48-Quintara/24th Street, providing direct connection to the Mission, rather than to Civic Center

21-Hayes:

- Increase frequency from 7-minute headways to 6-minute headways during the p.m. peak period
- Service west of Stanyan Street was eliminated and replaced by increased frequency of 5-Fulton

22-Fillmore:

- Increase frequency from 7-minute headways to 6-minute headways during the p.m. peak period
- Rerouted along 16th Street and Third Street to serve Mission Bay

24-Divisadero:

- Increase frequency from 10-minute headways to 7.5-minute headways during the p.m. peak period

27-Bryant:

- Service extended north on Leavenworth Street and Vallejo Street to Van Ness Avenue
- Line simplified by running two-way on Leavenworth Street and Ellis Street (further study needed)
- 27-Bryant would run on Folsom Street in South of Market and the Inner Mission to Cesar Chavez Street, replacing the 12-Folsom-Pacific service
- Direct connection would be provided to 24th Street BART Station and St. Luke's Hospital
- Service on Bryant Street would be discontinued and resources reallocated to Potrero Avenue and Folsom Street to provide more frequent service on both corridors

31-Balboa:

- Line simplified by running two-way on Eddy Street (further study needed)

33-Stanyan:

- Proposed 15-minute peak period frequency
- Service east of Potrero Avenue would be altered to service 16th Street, Kansas Street, 17th Street, Connecticut Street, and 18th Street
- Service west of Potrero Avenue would operate on current route

35-Eureka:

- Service extended to Glen Park BART Station
- Service on Farnum, Moffitt, Bemis, and Addison Streets eliminated
- Rerouted to Hoffman and Douglas Streets between 21st and 24th Streets
- Capacity reduced to van service

37-Corbett:

- Service to Corona Heights, Cole Valley, and the Haight would be eliminated and replaced by 32-Roosevelt

38-Geary:

- More frequent 38-Geary local service would be provided, in addition to more frequent 38L-Geary Limited service
- 38-Geary local would terminate at Fort Miley for most of the day, and would go to 48th Avenue/Point Lobos during late night hours when the 38L-Geary Limited is not running
- 38-Geary branch service to Ocean Beach would be discontinued, and replaced by rerouted 18–46th Avenue line
- Would coordinate with Geary BRT study currently under way, which aims to achieve significant travel time and reliability improvements

38BX-Geary B Express

- Stop would be added at Van Ness Avenue
- Proposed 10-minute a.m. peak and 15-minute p.m. peak period frequency

38L-Geary Limited

- Service would be expanded to operate between 6 a.m. and 10 p.m., 7 days a week
- Proposed 5-minute a.m. peak and 10-minute p.m. peak period frequency
- Service would be coordinated with Geary BRT studies

43-Masonic

- Service would be extended to Fort Mason
- Service in the Presidio would be modified to service the Presidio Transit Center
- Proposed 10-minute peak period (a.m. and p.m.) frequency

44-O'Shaughnessy

- Proposed 5-minute a.m. peak and 6.5-minute p.m. peak period frequency

47-Van Ness:

- Would terminate at Van Ness Avenue and North Point Street to allow better coordination with 49L-Van Ness-Mission; North Point segment would be picked up by new 11-Downtown Connector

- Would operate along South Van Ness Avenue, Division Street, and Townsend Street instead of Bryant Street/Harrison Street to provide faster connection to Caltrain and retail along 13th Street/Division Street
- Would coordinate with Van Ness BRT Study currently under way, which aims to achieve significant travel time and reliability improvements

48-Quintara-24th Street:

- Would extend service to Hunters Point Shipyard to cover portions of existing 19-Polk line
- Would operate the new 58, a 24th Street route to complement service between Diamond Street and the Potrero Hill area

49-Van Ness-Mission:

- Would make local stops on Van Ness Avenue and make limited stops on Mission Street to provide shorter travel times
- Mission Street would have more frequent service at all times of day provided by all-day local (14-Mission) and limited-stop service (14L-Mission Limited and 49L-Van Ness-Mission Limited)
- Limited-stop service would use trolley coaches and run every 5 minutes or better from 6 a.m. to 7 p.m., reducing travel time for most customers
- Would coordinate with Van Ness BRT Study currently under way, which aims to achieve significant travel time and reliability improvements

67-Bernal Heights:

- Service eliminated on the western portion of loop along Crescent Avenue and Mission Street

71-Haight/Noriega & 71L-Haight/Noriega Limited:

- Limited service would run all day to increase travel time for passengers west of Stanyan Street

F-Market & Wharves:

- Increase frequency from 7-minute headways to 5-minute headways during the p.m. peak period

J-Church:

- Increase frequency from 9-minute headways to 6-minute headways during the p.m. peak period
- Service extended to San Francisco State University (SFSU) at 19th Avenue

K-Ingleside:

- Increase frequency from 9-minute headways to 8.5-minute headways during the p.m. peak period

L-Taraval:

- Increase frequency from 7-minute headways to 5-minute headways during the p.m. peak period

M-Ocean View:

- Service would end at SFSU and would be replaced by the J-Church between Balboa Park and SFSU to allow more two-car trains during peak periods

N-Judah:

- Increase frequency from 7-minute headways to 5-minute headways during the p.m. peak period

Van Ness Avenue Bus Rapid Transit

The San Francisco County Transportation Authority (SFCTA) and SFMTA are currently preparing the *Van Ness Corridor BRT Study*. The agencies initiated this study in 2004 and anticipate BRT serving the corridor by 2014. Currently, the proposed project is in the environmental review stage that will identify a preferred project alternative. BRT would increase bus service frequency along Van Ness Avenue by giving buses a dedicated travel lane, priority at traffic signals, and high-quality bus stations. The agencies are considering these improvements to benefit existing riders and to attract new transit riders.

The Van Ness Corridor BRT Study[17] report identified and assessed four alternatives for bus improvements along Van Ness Avenue, including dedicated bus lanes, distinctive boarding stations, real-time bus arrival information, and urban design treatments. Implementation of BRT may result in the reconfiguration of the travel lanes and curb parking on Van Ness Avenue. The extent of the changes would depend on the service option selected for implementation. While four alternatives have been identified, the details of these various options are currently not known since the design of the project would be determined after a preferred alternative is chosen.

Geary Street Bus Rapid Transit

SFCTA and SFMTA are currently preparing the Geary Corridor BRT Study. The agencies initiated this study in 2004 and anticipate BRT serving the corridor by 2015–2016. The study was published in April 2007, and the Geary BRT project is in the environmental review process to identify a preferred project alternative. The Geary BRT would increase bus service frequency along Geary Street by giving buses a dedicated travel lane, priority at traffic signals, and high-quality bus stations. The agencies are considering these improvements to improve service for existing riders, attract new transit riders, and prevent increased auto congestion.

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[17] San Francisco County Transportation Authority. 2007 (April). Van Ness Corridor Bus Rapid Transit Study. San Francisco, CA.

The Geary Corridor BRT Study[18] report identified and assessed five alternatives for bus improvements along Geary Street, including dedicated bus lanes, distinctive boarding stations, real-time bus arrival information, and urban design treatments. Implementation of BRT may result in the reconfiguration of the travel lanes and curb parking on Geary Street, and the extent of the changes will depend on the service option selected for implementation.

Because the proposed Van Ness Avenue and Geary Corridor BRT projects are still being defined and evaluated by the SFCTA, no roadway geometric changes or transit operational improvements that would be proposed by these two projects were incorporated into the Modified Baseline and Cumulative impact analyses. However, an analysis was conducted to assess whether the project, in combination with the changes proposed as part of the BRT projects, would result in additional impacts not identified in the Modified Baseline and 2030 Cumulative impact analyses.

Bicycle Plan Changes

The recently approved *San Francisco Bicycle Plan* includes many improvements to the bicycle network throughout the City. Of the recommended improvements, 45 have been approved for implementation in the near-term. The following improvements were identified near the CPMC campuses:

- **McAllister Street Bike Lanes**—Bike lanes would be added to McAllister Street (Route 20) from Market Street to Masonic Avenue
- **Broadway Tunnel Signage Improvements**—Signage to the Broadway tunnel entrance areas would denote bicycles' shared use of the roadway and presence of the signed Class III bicycle route.
- **Broadway Bicycle Lanes**—Bicycle lanes (Class II facility) would be installed in both directions on Broadway between Polk Street and Webster Street.
- **Scott Street Northbound Left-Turn Lane**—A striped northbound bike left-turn lane has been added on Scott Street between Oak Street and Fell Street to connect existing bike lanes on Scott Street with bike lanes on Fell Street.
- **17th Street Bicycle Lanes**—New bike lanes would be added to 17th Street between Corbett Avenue and Kansas Street to connect with 16th Street BART, Valencia Street, and Division Street.
- **Polk Street Bicycle Lane**—A striped Class II bicycle lane in the northbound direction will be added on Polk Street between Market Street and McAllister Street. A segment of this bicycle lane would be contra-flow and

[18] San Francisco County Transportation Authority. 2007 (April). Geary Boulevard/Street Corridor Bus Rapid Transit Study. San Francisco, CA.

allow bicycles to travel northbound on Polk Street between Market Street and Grove Street (vehicle traffic is restricted to southbound one-way along this segment).

- **Cesar Chavez Street/16th Street Bicycle Lanes**—Installation of Class II and Class III facilities in both directions on Cesar Chavez Street between Hampshire Street and Sanchez Street.

Additionally, several potential long-term bicycle route modifications nearby have been identified in the *San Francisco Bicycle Plan* including:

- **Golden Gate Avenue Bicycle Route—**Golden Gate Avenue would be designated as a bicycle route between Baker Street and Market Street.
- **Post Street Bicycle Route**—Minor route enhancements would be made for the existing Class III Route 16 such as signage, striping, and signal timings, where feasible.
- **Sutter Street Bicycle Route**—Minor bicycle route enhancements would be made for the existing Class III Route 16 such as signage, striping, and signal timings, where feasible.
- **Geary Boulevard Bicycle Route**—Geary Boulevard would be designated as a bicycle route between 25th Avenue and Divisadero Street.
- **Steiner Street Bicycle Route**—Minor route enhancements would be made for the existing Class III Route 45 such as signage, striping, and signal timings, where feasible.
- **Webster Street Bicycle Route**—Minor route enhancements would be made for the existing Class III Route 10 such as signage, striping, and signal timings, where feasible.
- **O'Farrell Street Bicycle Route—**Provision of a Class II or Class III facility on O'Farrell Street between Market Street and Polk Street.

Development of Modified Baseline and Cumulative Traffic and Transit Forecasts

SFCTA's SF-CHAMP travel demand model was used to develop future year traffic and transit forecasts used in the impact analysis.[19] Year 2015 Modified Baseline, 2020 Modified Baseline, and 2030 Cumulative traffic

[19] The SF-CHAMP model is an activity-based travel demand model that has been validated to existing conditions and can be used to forecast future transportation conditions in San Francisco, and is updated regularly. The model predicts person-travel based on assumptions of growth in population, housing units, and employment by auto, transit, walk and bicycle modes. The SF-CHAMP model also provides forecasts of vehicular traffic on regional freeways, major arterials and local roadway networks considering the available roadway capacity, origin-destination demand, and congested travel speeds. The SF-CHAMP model travel demand estimates incorporate the Association of Bay Area Governments (ABAG) land use and socio-economic database and growth forecasts for the year 2030 (from ABAG Projections 2007), which provide forecasts of economic and population growth for San Francisco, as well as for the remaining eight Bay Area counties, as well as the Metropolitan Transportation Commission's (MTC) Regional Transportation Plan and SFCTA's Countywide Transportation Plan. Within San Francisco, the San Francisco Planning Department is responsible for allocating ABAG's countywide growth forecasts to

volumes were developed based on traffic growth rates between 2005 and 2030 developed from SF-CHAMP model output. The growth predicted by the model was applied to the existing year traffic volumes at the study intersections in order to obtain year 2015, 2020, or 2030 turning movement volumes, an approach that is typically followed to develop future traffic volume estimates in San Francisco. The resulting traffic estimates represent No Project traffic volumes within the study area, assuming no changes to the existing uses within the campuses.

Future year plus-Project traffic estimates for each area can then be developed by adding the number of vehicle trips that would be generated by each campus to the No Project traffic volumes. To determine Modified Baseline plus Project and Cumulative plus Project conditions, the project travel demand related to the full buildout of each campus was added to the Modified Baseline No Project and Cumulative No Project conditions.[20] The analysis for each CPMC campus accounts for any overlap in trips at common analysis locations. Future 2015 Modified Baseline, 2020 Modified Baseline, and 2030 Cumulative transit ridership on the Muni routes serving the campuses were similarly developed from the SF-CHAMP model output.

Modified Baseline 2015 No Project and Project conditions were developed for the proposed Cathedral Hill Campus, the California Campus, and the St. Luke's Campus, while Modified Baseline 2020 No Project and Project conditions were developed for the Pacific and Davies Campuses.

Project Travel Demand

The transportation effects associated with the travel demand generated by the project land uses were determined by calculating the daily person-trips generated, and the portion of those trips that would occur during the peak hours analyzed. Project travel demand was calculated for each campus separately. Because the CPMC LRDP involves construction of a new campus at Cathedral Hill and relocation of activities at existing campuses to the new campus and between campuses, the trip generation was based on the net-new uses. After determining the number of person trips generated by the Project, the trips were distributed to geographical origins/destination areas, including four San Francisco areas (i.e., Superdistrict 1, Superdistrict 2, Superdistrict 3, Superdistrict 4) and three other regions in the Bay Area (South Bay, East Bay, and North Bay).[21] The mode split analysis determined the portion of these trips made via automobile, transit, or any other mode of transportation, based upon the

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each SFCTA Traffic Analysis Zone (TAZ), based upon existing zoning and approved plans, using an area's potential zoning capacity and the anticipated extent of redevelopment of existing uses. The increase in transit and vehicle trips between existing conditions and 2030 No Project conditions was based on a comparison between model output that represents existing conditions and model output for 2030 conditions. Additional details on travel demand forecasting for the proposed LRDP is documented in Assessment of No Project Cumulative Traffic Conditions near Five CPMC Campus Sites in San Francisco—Year 2015 and 2030 Traffic Volume Estimates, April 2010, prepared by Adavant Consulting. This memo is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 20005.0555E.

[20] Adavant Consulting. 2010 (April 9). CPMC LRDP Travel Demand Estimation for the San Francisco Campuses, San Francisco, CA. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 20005.0555E.

[21] Superdistricts are travel analysis zones established by the Metropolitan Transportation Commission (MTC). San Francisco is divided into four Superdistricts delineated to capture the different travel characteristics that are associated with the various street network, transit opportunities, and geographical constraints of different areas of San Francisco.

origin/destination of the trips, the purpose of the trips, and the availability of various modes. Finally, automobile occupancy rates were determined, to yield the average number of individuals in a vehicle, and, thus, determine the number of vehicles that would be traveling to and from the campuses.

Project Trip Generation

The methods commonly used for forecasting trip generation of development projects in San Francisco are based on person-trip generation rates, trip distribution information, and mode split data described in the *Transportation Impact Analysis Guidelines for Environmental Review*, San Francisco Planning Department, October 2002 (SF Guidelines). These data are based on a number of detailed travel behavior surveys conducted within San Francisco. The data in the SF Guidelines are generally accepted as more appropriate than conventional methods because of the relatively unique mix of uses, density, availability of transit, and cost of parking commonly found in San Francisco. However, the SF Guidelines do not include hospital and medical office building trip generation rates. Similarly, standard trip generation rates, such as those provided by Trip Generation, 7th Edition, 2003, Institute of Transportation Engineers, would not be suitable for the project, unless appropriate adjustments were made to account for the project size, mix, and availability of transit.

Travel demand estimates for the campuses were calculated based on the projected number of physicians, staff and visitors and travel surveys of existing CPMC facilities, including pedestrian and traffic counts. Forecasting the net new travel demand involved estimating the number of trips generated at project completion of each campus, less trips associated with the existing uses on-site. Travel demand characteristics and forecasts for the Cathedral Hill Campus were developed by Adavant Consulting,[22] and additional detail related to the trip generation methodology are included in the transportation impact study for each campus.

Trip Generation Sources

Medical facilities generate travel demand in unique ways, depending on their location, specialties, and surrounding land uses. To forecast travel demand for the campus, several CPMC-specific data sources were obtained and processed, including:

- **CPMC Population Estimates:** Daily and a.m. and p.m. peak period population estimates, in terms of doctors, staff and visitors, were provided by CPMC by major land use and campus location and reflect the proposed uses. This information informed the fundamental assumptions for the trip generation projections at the campuses.

[22] Adavant Consulting. 2010 (April 9). CPMC LRDP Travel Demand Estimation for the San Francisco Campuses. San Francisco, CA. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 20005.0555E.

- **Employee, Patient, and Visitor Travel Surveys:**[23] A series of employee, patient and visitor travel behavior surveys were conducted by CHS Consulting Group in 2001 at the Pacific, California, and Davies Campuses.[24] CPMC employees were surveyed in January 2001, while patients and visitors were surveyed in February 2001. The employee survey questions included residence location, work schedule, travel mode, parking locations and reasons for driving alone. The visitor survey questions focused on travel mode, origin/destination, parking location, and parking costs. In 2009, CPMC conducted the same travel survey for the St. Luke's Campus.

- **Travel Surveys and Counts:** CHS Consulting Group conducted a series of travel surveys and pedestrian and vehicular counts at three CPMC campuses between October 2002 and April 2003: Pacific, California, and Davies.[25] For each of the three campuses, several data collection efforts were conducted:

  - **Person counts—**Counts of individuals entering and exiting the individual buildings and the perimeter of the CPMC campus were conducted at 15-minute intervals from 7 a.m. to 7 p.m. on a typical weekday;

  - **Vehicle and occupancy counts**—Counts of the number of vehicles entering and exiting the garages at each campus were conducted at 15-minute intervals from 7 a.m. to 7 p.m. on a typical weekday. The number of occupants in each vehicle was also recorded;

  - **Intercept questionnaire surveys**—Surveys of individual travel patterns, including origin and destination, were conducted using questionnaires at selected locations on each campus from 8 a.m. to 4 p.m. The results of the intercept questionnaires were also used to estimate the number of internal trips within each campus; and

  - **Supplemental sample survey**—Counts of persons entering and exiting minor access points at selected buildings were conducted between 2 p.m. and 4 p.m.

- **Additional Travel-Related Data:** In addition to the travel surveys other travel-related information has been gathered for this analysis between 2001 and 2009, such as:

  - entry-exit parking ticket records for the garages at each campus under CPMC control;

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[23] Travel surveys of existing CPMC personnel, patients and visitors conducted 2001 through 2009 were used to develop origin-destination, travel mode split, and average vehicle occupancy assumptions. Survey information was determined to be valid for determining LRDP travel demand, since existing CPMC campuses are located in established neighborhoods with limited land use changes, and with limited roadway network, transit service, and parking supply changes.

[24] CHS Consulting Group. 2001. CPMC 2001 Employee and Patient/Visitor Travel Patterns. San Francisco, CA. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 20005.0555E.

[25] CHS Consulting Group. 2004. CPMC Trip Generation Methodology Survey and Findings. San Francisco, CA. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 20005.0555E.

- inbound and outbound vehicle counts at the parking garage at the Cathedral Hill Hotel;
- average hotel room and office occupancy rates for the existing buildings at the project site; and
- number of existing and proposed employees by shift at the campus (Daytime: 9 a.m. to 6 p.m., Shift 1: 7 a.m. to 3 p.m., Shift 2: 3 p.m. to 11 p.m., Shift 3: 11 p.m. to 7 a.m.), as well as the number of employees expected to be absent (either sick or paid time off) on a typical weekday.

Person Trip Generation Rates

Using Daily and a.m. and p.m. peak-hour population data for each of the existing CPMC campuses, person trip generation rates were developed for each population group through an iterative process. The conditions for the development of these trips were:

- reflect logical travel journeys to/from the campus and within the campus for each population type (physicians, staff, patients and visitors);
- have the same value across all campuses for each land use type (MOB, ambulatory care center [ACC], hospital, research/office);
- produce results that are in line with those obtained from the staff, patient and visitor surveys previously conducted at each campus; and
- result in overall trip generation rates that are comparable to those shown in other transportation studies of similar facilities or obtained from other recognized sources such as the other medical centers in San Francisco, the Institute of Transportation Engineers (ITE), the San Diego Association of Governments (SANDAG), and Caltrans.
- Estimates for staffing and patient levels on a daily basis were developed by CPMC based on the services proposed to be located at the campus and reviewed by the San Francisco Planning Department. The population groups include the following:
- **Physicians:** Physicians include CPMC doctors and physicians, as well as community doctors and physicians working at the MOBs who are not directly affiliated with CPMC but are physically present ("on-site") at the campus on a typical day. It also includes "visiting" doctors who are not based at the campus full-time, but come to the campus for patient visits or to perform surgery.
- **Staff:** Staff includes nurses, physician assistants, therapists, dieticians, administrative workers and nonmedical employees who are physically on the campus on a typical day, including volunteers. Similar to

the physician's category, these may or may not be affiliated with CPMC. Collectively, staff and physicians comprise the employees on the campus.

- **Patients:** This group includes all individuals at the campus for some sort of medical treatment. They may include inpatients or outpatients visiting a MOB or receiving diagnostic work throughout the day.

- **Visitors:** Visitors may include individuals accompanying outpatients, plus those visiting patients, staff, or physicians throughout the day.

The resultant trip generation rates for each population group were then compared to the travel surveys conducted at each of the existing campuses. This comparison was done to ensure that the estimated trip generation values correspond with existing travel patterns at the Pacific, California, and Davies Campuses. The estimated values correspond well with those obtained from the survey data, but tend to overestimate trips by about 10 percent, meaning the trip rates used in the analysis tend to be conservative. The empirical trip generation rates were also compared with other person trip generation rates and travel demand data gathered from other transportation studies for comparable land uses (e.g., UCSF Medical Center, Kaiser San Francisco Medical Center, San Francisco General Hospital). In general, the daily person trip generation rate developed for CPMC was higher for hospital uses and the same for MOB uses. The vehicle trip generation rates for CPMC are comparable and slightly higher than other San Francisco medical centers, but slightly lower than SANDAG and ITE sources. This was attributed to the availability of public transit within San Francisco.[26]

It should be noted that the travel demand estimates reflect the effects of CPMC's existing Transportation Demand Management (TDM) Program. Key elements of the TDM program include:

- free shuttle service to and from the various campuses;

- a commuter benefit program (pretax dollars for public transportation fares);

- a guaranteed ride home program;

- participation in 511.org's Regional Rideshare Program;

- a yearly monetary ($2,500) subsidy for vanpool vehicles;

- an annual transportation fair with free bicycle workshops sponsored by RIDES for Bay Area Commuters and the San Francisco Bicycle Coalition;

[26] Adavant Consulting. 2010 (April 9). CPMC LRDP Travel Demand Estimation for the San Francisco Campuses, San Francisco, CA. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 20005.0555E. See Section 4.4. .

- a monthly parking fee charge of $110 by CPMC staff who drive (although physicians receive free parking);
- provision of free parking for registered carpool/vanpool vehicles with three or more CPMC campus employees; and
- parking fees for visitors and patients set at levels to discourage long-term parking.

As part of the *California Pacific Medical Center Institutional Master Plan* (IMP), several elements of the existing TDM program would be expanded to enhance the effectiveness of the program to encourage use of alternate modes and reduce single-occupant vehicle trips by employees, patients and visitors. Since the effectiveness of the expanded TDM program and effect on CPMC employee, patient and visitor travel modes would be difficult to determine, the expanded program was not considered in developing the travel demand forecasts.

Person Trip Generation Estimates

For each campus, the trip generation rates were applied to the proposed populations to determine the total trips that would be generated at full buildout conditions. The trip generation estimates were adjusted to reflect the change in CPMC-related uses at each campus. For the Cathedral Hill Campus, since the project includes demolition of existing land uses, the trips generated by these uses were subtracted from the new project trips to determine the net-new trips. The trip generation for the existing uses was based on standard rates obtained from the SF Guidelines, supplemented with data gathered from the ITE for the a.m. peak hour. In some cases where buildings to be demolished were only partially occupied, trip generation credits were not taken. Table 4.5-10, (page 4.5-76) “Daily and Peak Hour Person Trip-Generation by Population Group by Campus” summarizes the total daily and p.m. peak-hour trip generation by population group for each campus. The analysis does not assume any new trip generation at the California Campus because campus activities would remain unchanged until 2015, and would then be gradually relocated to the Pacific or Cathedral Hill Campuses. By 2020, almost all CPMC-related uses at the California Campus are expected to cease.

Mode Split

Mode split is the relative proportioning of project-generated trips to various travel modes, including automobile, transit, walking and other, where “other” includes bicycle, motorcycle and taxi. An average vehicle occupancy factor was applied to the number of automobile person trips to determine the number of vehicle trips. Mode split and average vehicle occupancy assumptions were based on information contained in the *SF Guidelines*, as well as the data described earlier that was collected at other CPMC campuses. This analysis also assumes that all physicians drive to campus.

Table 4.5-10
Daily and Peak-Hour Person Trip-Generation by Population Group by Campus[1]

	Daily	(A.M. Peak Hour for Cathedral Hill Only) P.M. Peak Hour				
		Physicians	Staff	Patients	Visitors	Total
Cathedral Hill Campus[2]						
Proposed Population	***9,569***	***(201) 180***	***(1,481) 1,149***	***(151) 310***	***(126) 216***	***(1,950) 1,855***
New Person Trip Generation						
Cathedral Hill Hospital	16,203	(65) 53	(1,045) 856	(25) 30	(67) 85	(1,202) 1,024
Cathedral Hill MOB	8,480	(80) 80	(324) 324	(116) 260	(58) 130	(578) 794
1375 Sutter MOB	2,929	(27) 27	(112) 112	(40) 90	(20) 45	(199) 274
Total New Trips	***27,611***	***(172) 160***	***(1481) 1,292***	***(182) 380***	***(145) 260***	***(1,980) 2,092***
Credit for Existing Uses	-7,664	–	–	–	–	(-550) -693
Net-New Trips	***19,947***	***–***	***–***	***–***	***–***	***(1,430) 1,399***
Pacific Campus						
Net-New Population Growth	***-1,495***	***-90***	***-21***	***199***	***56***	***144***
Net-New Person Trip Generation						
MOB	-3,295	-19	-339	127	63	-168
ACC	7,380	8	747	153	101	1,009
Hospital	-8,460	-37	-449	-25	-74	-585
Research/Office	-324	-3	-55	0	0	-58
Net-New Trips	***-4,701***	***-51***	***-96***	***255***	***90***	***198***
Davies Campus						
Net-New Population Growth	***1,221***	***18***	***286***	***51***	***33***	***388***
Net-New Person Trip Generation						
MOB	2,986	14	239	56	28	337
Hospital	1,081	1	56	3	9	69
Net-New Trips	***4,070***	***15***	***295***	***59***	***37***	***406***
St. Luke's Campus						
Net-New Population Growth	***1,258***	***33***	***121***	***89***	***45***	***288***
Net-New Person Trip Generation						
MOB	3,674	29	119	113	57	318
Hospital	299	1	10	-1	-1	9
Research Office	-34	0	-6	0	0	-6
Net-New Trips	***3,941***	***30***	***123***	***112***	***56***	***321***
Total Net-New Trips	***23,257***	***154***	***1,614***	***806***	***443***	***3,017***

Notes: ACC = Ambulatory Care Center; MOB = Medical Office Building

1 The analysis does not assume any new travel demand at the California Campus because campus activities would remain unchanged until 2015, and would then be gradually relocated to the Pacific and Cathedral Hill Campuses. By 2020, almost all CPMC-related uses at the California Campus are expected to cease.

2 For the Cathedral Hill Campus, the a.m. peak-hour travel demand is presented in (parentheses).

Source: Data compiled by Adavant Consulting and Fehr & Peers in 2010.

The methodology assumes that the modal share would be appropriate to represent both existing and future travel conditions at the CPMC campuses, that is, mode shifts between existing conditions and future conditions are not expected. Although the CPMC LRDP development plans assume an increase in parking supply with the construction of new garages, it is assumed that similar transportation management strategies to those that exist today would be in place when such facilities are opened to act as disincentives to driving by employees, patients and visitors despite the increase in the supply of off-street parking.

Table 4.5-11, "Net-New Peak Hour Person Trips by Mode and Vehicle Trips by Campus" (page 4.5-77), presents the net-new peak-hour person trips by mode, as well as vehicle trips, for each campus. The mode share varies between campuses, with the lowest auto mode at the Cathedral Hill Campus and highest auto mode at the St. Luke's Campus. At the Cathedral Hill Campus, about 50 percent of person trips would occur by auto, 40 percent by transit, and 10 percent by walking, bicycling and other modes. At the Pacific Campus, about 58 percent of person trips would be by auto, 19 percent by transit, and 23 percent by walking, bicycling and other modes. At the Davies Campus, about 55 percent of trips would be by auto, 34 percent by transit, and 11 percent by walking, bicycling and other modes. At the St. Luke's Campus, about 78 percent of trips would be by auto, 12 percent by transit, and 10 percent by walking, bicycling, and other modes.

Table 4.5-11
Net-New Peak-Hour Person Trips by Mode and Vehicle Trips by Campus [1]

	Person Trips by Mode					
Campus	Auto	Transit	Walk	Other [2]	Total	Vehicle Trips
Cathedral Hill Campus						
a.m. peak hour	682	586	108	54	1,430	593
p.m. peak hour	689	551	107	50	1,399	609
Pacific Campus						
p.m. peak hour	114	37	27	20	198	71
Davies Campus						
p.m. peak hour	224	138	10	34	406	202
St. Luke's Campus						
p.m. peak hour	251	39	25	6	321	207

Notes:
1 The analysis does not assume any new travel demand at the California Campus because campus activities would remain unchanged until 2015, and would then be gradually relocated to the Pacific and Cathedral Hill Campuses. By 2020, almost all CPMC-related uses at the California Campus are expected to cease.
2 "Other" includes bicycle, motorcycle and taxi trips.
Source: Data compiled by Adavant Consulting and Fehr & Peers in 2010

Project Trip Distribution

Trip distribution patterns for the hospital and medical facilities were based on surveys of employees, patients and visitors conducted by CPMC at the Pacific, Davies, and St. Luke's Campuses. Table 4.5-12, "Trip Distribution Patterns by Campus" (page 4.5-78), presents the distribution of trips to and from San Francisco and areas outside of San Francisco. At all campuses, the majority of patient and visitor trips would occur within the boundaries of San Francisco. At the Cathedral Hill, Pacific, and Davies Campuses, about 50 percent of the employee trips would be from within San Francisco, with employee trips to and from the East Bay representing the greatest majority from outside of San Francisco. At the St. Luke's Campus, the proportion of employee trips from within San Francisco would be the lowest (i.e., 42 percent), with a substantial proportion of employee trips (36 percent) from the South Bay.

Table 4.5-12
Trip Distribution Patterns by Campus

	Cathedral Hill and Pacific Campus			Davies Campus			St. Luke's Campus		
	Employees	Patients	Visitors	Employees	Patients	Visitors	Employees	Patients	Visitors
San Francisco									
Superdistrict 1 (northeast)	8%	20%	8%	11%	15%	8%	6%	14%	12%
Superdistrict 2 (northwest)	24%	31%	30%	17%	13%	36%	4%	5%	12%
Superdistrict 3 (southeast)	11%	17%	13%	17%	47%	28%	26%	63%	37%
Superdistrict 4 (southwest)	8%	9%	11%	8%	8%	6%	6%	3%	4%
East Bay	18%	8%	12%	22%	7%	4%	16%	2%	10%
North Bay	15%	7%	8%	9%	5%	4%	5%	0%	8%
South Bay	16%	8%	13%	17%	6%	11%	36%	11%	17%
Out of Region	0%	1%	6%	0%	1%	4%	1%	3%	2%
	100%	100%	100%	100%	100%	100%	100%	100%	100%

Source: Data compiled by Adavant Consulting and Fehr & Peers in 2010

Parking Demand

Because of the unique nature of a hospital and medical campuses, parking demand cannot be estimated by directly applying the parking demand methodology described in the SF Guidelines for commercial uses. Instead, the existing parking demand at each campus was estimated based on travel surveys of CPMC employees, visitors, and patients, and the parking demand rate developed from this information was applied to the future buildout population that would be on each campus. A CPMC-specific parking demand tool, developed by CHS

Consulting,[27] was used to estimate parking demand for each campus. The existing parking demand was estimated using existing data sources: population estimates from CPMC and mode splits obtained from travels surveys conducted at CPMC campuses in 2001, 2002 and 2009. Parking turnover rates were estimated for each user and building (i.e., MOB, hospital) based on the following key assumptions:

- all physicians drive alone (assigned parking provided to physicians);
- MOB business hours are from 8:30 a.m. to 4:30 p.m.;
- 90 percent of patients and visitors make a trip to the hospital between 9 a.m. to 6 p.m.;
- the average duration of stay for outpatients at the MOB and hospital is 1.5 hours;
- the average duration of stay for visitors to the MOB is 1.5 hours;
- each inpatient at the hospital would generate 2.5 visitors: one family visitor, one friend visitor, and 0.5 business visitor per day;
- the average duration of stay for each visitor would be 5 hours (family), 3 hours (friends), and 1.5 hours (business), respectively; and
- CPMC would provide a limited number of employee parking permits issued through a lottery system.

The existing parking demand estimated using the travel surveys and parking turnover assumptions was compared to the parking supply provided by CPMC at all parking facilities owned or leased by CPMC. Any unmet demand (i.e., drivers not finding parking in CPMC parking facilities) was assumed to park on street in the vicinity of the campus. The percentages of people who park on the street were compared to the CPMC Travel Survey results. Future parking demand was calculated using the future population estimates and parking demand rates developed by validating the existing parking demand model described earlier. The existing mode split rates from the surveys, from which parking demand is derived, were assumed for the Pacific, Davies, and St. Luke's Campuses, and the rates provided in the SF Guidelines were used for the Cathedral Hill Campus.

Table 4.5-13, "Parking Demand by Campus," summarizes the parking demand for the campus by population group. For the Pacific, Davies, and St. Luke's Campuses, the parking demand associated with the existing uses is presented as well as the parking demand at buildout conditions, and the net-new demand is identified. The parking assessment was conducted using the demand presented for buildout conditions.

[27] CHS Consulting Group. 2010 (July 7). CPMC Parking Analysis. Memorandum to Robert Ecklers of Fehr & Peers. This memo is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 20005.0555E.

Table 4.5-13
Parking Demand by Campus[1]

	Physicians	Employees	Visitors/Patients	Total
Cathedral Hill				
Cathedral Hill Hospital	107	415	242	764
Cathedral Hill MOB	114	107	244	465
1375 Sutter	39	37	84	160
Total demand	260	559	570	1,389
Pacific Campus				
Existing	366	851	589	1,806
Buildout Conditions	260	708	609	1,577
Net-New Demand	-106	-143	20	-229
Davies Campus				
Existing Conditions	82	308	179	569
Buildout Conditions	105	478	250	833
Net-New Demand	23	178	71	264
St. Luke's Campus				
Existing Conditions	70	225	224	519
Buildout Conditions	98	337	324	759
Net-New Demand	28	112	100	240

Note:
[1] The analysis does not assume any new travel demand at the California Campus because campus activities would remain unchanged until 2015, and would then be gradually relocated to the Pacific and Cathedral Hill Campuses. By 2020, almost all CPMC-related uses at the California Campus are expected to cease.
Source: Data compiled by Adavant Consulting and Fehr & Peers in 2010

Service Vehicle and Truck Loading/Unloading Demand

Service vehicle and truck loading/unloading demand was calculated based on the uses proposed at each campus, and information obtained through extensive surveys of the existing loading facilities at the Pacific, California, Davies, and St. Luke's Campuses. The results of the surveys are included in the transportation impact studies for these campuses.

For the **Davies Campus** and the **St. Luke's Campus**, the daily truck trip generation rate was based on surveys of the existing campus. At the St. Luke's Campus, a rate of 0.15 trip per 1,000 square feet of hospital and medical office uses, as developed from existing conditions at St. Luke's, was used. At the Davies Campus, a rate of 0.22 trip per 1,000 square feet of combined medical office/hospital space was used. To calculate peak-hour demand, the loading methodology presented in the SF Guidelines was modified to reflect the average duration of stay for vehicles at loading spaces based on the surveys.

For the **Pacific Campus**, which would include conversion of 2018 Sacramento Street into office space, the SF Guidelines methodology for estimating commercial vehicle and freight loading/unloading demand was used to calculate the demand. Daily truck trip generated per 1,000 square feet were calculated based on the rates contained in the SF Guidelines. The resulting truck trips were then converted to an hourly demand for loading spaces based on a 9-hour day, and a 25-minute average stay. Average hourly demand was converted to a peak-hour demand by applying a peaking factor, as specified in the SF Guidelines.

For the **Cathedral Hill Campus**, the loading demand was based on existing surveys of hospital and MOB uses that were conducted at the Pacific Campus and California Campus.

- **At the Cathedral Hill Hospital**, the programmatic activities related to the inpatient activities at the Pacific Campus and the California Campus would be relocated to the Cathedral Hill Hospital and the project-generated truck trips at the new hospital would be expected to be similar to the total trucks at these two campuses. In addition to findings of the surveys, the CPMC Materials Management staff reviewed a list of vendors that currently make deliveries to the Pacific Campus and the California Campus, and a CPMC truck management plan was developed to identify opportunities to consolidate trips and reduce the number of trucks deployed to the various campuses. The following plan elements were identified to consolidate and reduce the total number of truck trips to the various campuses:

  1. Vendors that now make separate trips to both the California Campus and the Pacific Campus (two trips) would make a consolidated trip to the proposed Cathedral Hill Campus (e.g., Federal Express, UPS, Office Depot);

  2. Some deliveries would be shifted to a proposed distribution center in Burlingame (e.g., medical surgical supplies, linen, and uniforms); and

  3. Some service deliveries would be eliminated due to operational changes at the campuses.

  The number of loading spaces needed to accommodate the consolidated demand was estimated using the recorded truck arrival and departure times at the Pacific Campus and the California Campus that occurred during the peak 5-minute period on the survey day with the highest number of recorded deliveries.

- **For the Cathedral Hill MOB and 1375 Sutter Street MOB,** a daily and peak-hour loading demand was estimated based on the loading surveys conducted at the Pacific Campus and California Campus MOBs. A weighted average rate of 0.20 trips per 1,000 square feet of medical office space was used to calculate daily loading demand and a weighted average rate of 0.007 space per 1,000 square feet was used to calculate loading demand during the peak hour of loading activities.

CPMC proposes to maintain warehouse facilities off-site to serve the CPMC campus system. Some of the shipments to the CPMC campuses would be delivered to the off-site warehouse, then get consolidated into smaller trucks for delivery whenever possible.

The *CPMC LRDP Truck Management Plan* outlined below would serve to reduce the demand for large trucks at the campuses. The plan includes the following measures:

- Extend dock operating hours to 19-hour or 24-hour periods to meet demand between 7 a.m. and 7 p.m;
- Actively manage loading areas 24 hours a day to ensure that trucks park efficiently and do not dwell in loading spaces;
- Deliveries from the West Bay Distribution Center (the centralized-CPMC delivery center in Burlingame) would occur between 9:30 p.m. and 4 a.m. to minimize conflicts with non-CPMC couriers;
- Deliveries, such as laundry services and trash haulers, would be scheduled before 7 a.m. or after 7 p.m. to minimize conflicts with other couriers;
- Vehicles longer than 55 feet would be prohibited from entering the loading dock at the hospital; and
- Trash pick-up would occur between 4 a.m. and 5 a.m. At the Cathedral Hill Hospital there would be two dedicated loading spaces within the hospital's loading dock area. The Cathedral Hill MOB would have a trash storage room that would be accessible from the service driveway on Cedar Street.

Table 4.5-14, "Service Vehicle and Truck Loading Space Demand by Campus," presents the number of service vehicles/trucks generated by the CPMC LRDP uses on a daily basis by campus, and the demand for loading dock spaces during the peak hour of loading activities.

Passenger Loading/Unloading Demand

The demand for visitor and patient loading/unloading activities at the campuses was estimated using the methodology described in the SF Guidelines for passenger loading areas at hotels, with adjustments made to account for the difference between hotels and medical facilities. Passenger loading/unloading demand was estimated using the number of peak-hour arrivals by vehicle, and converting the peak-hour arrivals into the number of passenger vehicles expected to be loading simultaneously.[28] Table 4.5-15, "Passenger

[28] Passenger loading/unloading demand was calculated using 50% of the peak hour patient and visitor trips by vehicle, multiplied by a peaking factor of 2, and divided by 4 to estimate the number of vehicle arrivals in a peak 15-minute period. The resulting vehicle trips are multiplied by an average 3-minute duration of loading/unloading activity, and divided by 15 minutes to calculate the peak minute vehicles at the loading/unloading zone. The number of vehicles is multiplied by 25 feet to estimate the length in feet of loading demand.

Table 4.5-14
Service Vehicle and Truck Loading Space Demand by Campus[1]

	Daily Service Vehicles/Trucks	Peak-Hour Loading Space Demand
Cathedral Hill Campus		
Cathedral Hill Hospital	113	19.0
Cathedral Hill MOB	52	3.7
1375 Sutter	18	1.3
Total Demand	***183***	***24.0***
Pacific Campus		
MOB	152	9
Retail	2	0.2
Office Building	1	0.2
Total Demand	***155***	***9.4***
Davies Campus		
Total Demand	***114***	***8***
St. Luke's Campus		
Total Demand	***66***	***5***

Note:
[1] The analysis does not assume any new travel demand at the California Campus because campus activities would remain unchanged until 2015, and would then be gradually relocated to the Pacific and Cathedral Hill Campuses. By 2020, almost all CPMC-related uses at the California Campus are expected to cease.
Source: Data compiled by Fehr & Peers in 2010

Loading/Unloading Zone Demand by Campus," presents the passenger loading/unloading demand for the campuses.

CPMC Shuttle Demand

The CPMC shuttle demand was calculated based on existing characteristics of the shuttle service, the proposed repurposing of the CPMC campuses, and the revised shuttle routes. With the repurposing of the CPMC campuses, as envisioned by the CPMC LRDP, intercampus trips based on the services provided on each campus would likely be reduced, but the full extent of this reduction is still unknown. It is likely that as medical activities and disciplines such as emergency care, inpatient care, and medical offices become more consolidated at the campuses, there would be less demand for employees or patients to visit multiple campuses throughout the day. Currently, three shuttle routes primarily serve intercampus trips: the California–Pacific Line, Davies–Pacific Line, and Cathedral Hill–Pacific Line. The shuttle routes would be reconfigured as part of the proposed LRDP to connect to the proposed Cathedral Hill Campus instead of the Pacific Campus. The proposed shuttle system would have shuttle connections between the Cathedral Hill Campus and the Pacific Campus, Davies Campus, and the St. Luke's Campus.

Table 4.5-15
Peak Hour Passenger Loading/Unloading Zone Demand by Campus[1]

	Passenger Car Equivalents	Length in Feet of Loading Demand
Cathedral Hill Campus[2]		
Cathedral Hill Hospital	(2.4) 3.0	(60) 75
Cathedral Hill MOB	(4.6) 10.1	(114) 253
1375 Sutter	(1.6) 3.5	(40) 88
Pacific Campus		
New ACC	8.6	215
Buildout Conditions[3]	25.0	625
Davies Campus		
Neuroscience Institute & Castro/14th St MOB	2.5	63
Buildout Conditions[3]	8.7	218
St. Luke's Campus		
Replacement Hospital & New MOB	3.0	75
Buildout Conditions[3]	10.1	253

Notes: MOB = Medical Office Building
1 The analysis does not assume any new travel demand at the California Campus because campus activities would remain unchanged until 2015, and would then be gradually relocated to Pacific and Cathedral Hill Campuses. By 2020, almost all CPMC-related uses at the California Campus are expected to cease.
2 For Cathedral Hill Campus, the a.m. peak-hour demand is presented in (parentheses).
3 Buildout conditions represent total activity associated with uses of the existing facilities (that would remain the same) and uses of the proposed facilities.
Source: Fehr & Peers, Data compiled by CHS Consulting Group in 2010

With the shifting of primary hospital and inpatient care uses from the Pacific Campus to the proposed Cathedral Hill campus, the CPMC shuttle system would be reconfigured around the Cathedral Hill campus, with several new routes serving the site. The system would have eight routes that would serve the four future campuses—Cathedral Hill, Pacific, Davies, and St. Luke's—and BART and Caltrain. Shuttle vans, with a capacity of 14 passengers, would be used.

- **The Pacific-BART line** would serve the Pacific Campus, the Japan Center Garage, the proposed Cathedral Hill Campus, and the Civic Center BART Station at approximately 6-minute headways. The route is assumed to operate approximately between 5:30 a.m. and 7 p.m. (similar to the existing BV-Line). Approximately five shuttles would be needed to operate the shuttle route at 6-minute headways, depending on traffic conditions.
- **The Cathedral Hill–BART line** would serve the Cathedral Hill Campus and the Civic Center BART Station at approximately 3-minute headways. The route is assumed to operate approximately between 5 and 11 a.m. and between 2:30 and 9 p.m. (similar to the existing JC-Express shuttle route serving commuting hours).

Approximately five shuttles would be needed to operate the shuttle route at 3-minute headways, depending on traffic conditions.

- **The Folsom–Caltrain line** would serve the Cathedral Hill Campus, the 4th Street Caltrain Station, and CPMC offices located at 633 Folsom Street at approximately 30-minute headways. This route is assumed to operate approximately between 6 a.m. and 9 a.m. and between 3 p.m. and 6 p.m. and would require one shuttle to operate the route at 30-minute headways, depending on traffic conditions.

- **The Cathedral Hill–Davies line** would serve the Cathedral Hill Campus and the Davies Campus at approximately 30-minute headways. This route is assumed to operate approximately between 6 a.m. and 6 p.m. (similar to the existing D-Line). One shuttle would be needed to operate the shuttle route at 30-minute headways, depending on traffic conditions.

- **The Cathedral Hill–St. Luke's line** would serve the Cathedral Hill Campus and the St. Luke's Campus at approximately 30-minute headways. This route is assumed to operate approximately between 6 a.m. and 6 p.m. (similar to the existing SL-Line). One shuttle would be needed to operate the shuttle route at 30-minute headways, depending on traffic conditions.

- **The Pacific–Davies line** would serve the Pacific Campus and the Davies Campus at approximately 30-minute headways. This route is assumed to operate approximately between 6 a.m. and 6 p.m. One shuttle would be needed to operate the shuttle route at 30-minute headways, depending on traffic conditions.

- **The St. Luke's–Davies–BART line** would serve the Davies and St. Luke's Campuses and the 24th Street BART station in San Francisco at approximately 30-minute headways. This route is assumed to operate approximately between 6 a.m. and 6 p.m. One shuttle would be needed to operate the shuttle route at 30-minute headways, depending on traffic conditions.

- **Non-CPMC private shuttle services** would be provided by a private garage operator as demand for off-campus parking increases. Operating details of this shuttle service, including service hours and vehicle capacities, would be based on observed demand.

Table 4.5-16, "Daily CPMC Shuttle Demand," below summarizes the shift in shuttle ridership associated with the redistribution of shuttle services, as well as increased development associated with the CPMC LRDP. These estimates conservatively assume that most transit riders to and from the campuses use the CPMC shuttle, rather than Muni, to access the nearest BART station. The total daily estimated shuttle trip demand, including users of satellite parking facilities, transit riders, and intercampus users, is approximately 7,500–8,000 passengers.

Table 4.5-16
Daily CPMC Shuttle Demand

CPMC Shuttle Line	Existing Demand	Future Estimated Daily Demand[7]
Cathedral Hill–Civic Center BART[1]	–	4,028
Cathedral Hill–Pacific/Japantown/BART[2]	172	1,756–2,004
Cathedral Hill–St. Luke's/24th Street BART[3]	–	270
Cathedral Hill–Davies	–	212–317
Cathedral Hill–Folsom/Caltrain	–	150[8]
Pacific–Davies	423	106–212
St. Luke's–Davies/24th Street BART[4]	30	270
Non-CPMC Private Shuttle Services[5]	–	750
California–Pacific[6]	496	–
BART–Van Ness	503	–
Japan Center Garage–Pacific	381	–
Total	**2,005**	**7,542–8,001**

Notes:
BART = Bay Area Rapid Transit
1 Assumes that 100 percent of daily transit trips between the Cathedral Hill Campus and the East Bay, South Bay and Superdistrict 4 use this shuttle to access Civic Center BART/Muni Station.
2 Assumes that 50 percent of daily transit trips from Superdistrict 3, 100 percent of daily transit trips from the South Bay, 75 percent of daily transit trips from Superdistrict 4, and 100 percent of daily transit trips from the East Bay use this shuttle to access Civic Center BART/Muni Station.
3 Assumes that 50 percent of daily transit trips between the St. Luke's Campus and the 24th BART station use this line. These trips are composed of 38 percent of the daily transit trips from Superdistrict 1, the East Bay and the South Bay, and 12 percent of daily trips from Superdistrict 3 use this route. Persons traveling between St. Luke's Campus and Cathedral Hill Campus may be fewer.
4 Assumes that 50 percent of daily transit trips between the St. Luke's Campus and the 24th BART station use this line. These trips are composed of 37 percent of the daily transit trips from Superdistrict 1, the East Bay and the South Bay, and 12 percent of daily trips from Superdistrict 3 use this route. Persons traveling between St. Luke's Campus and Davies Campus may be fewer.
5 Assumes that 205 of St. Luke's staff and 170 of Davies staff park in other off-site garages, such as the 12th Street Garage. This service could be provided by the garage operator.
6 Includes the GMG Line between California Campus and Geary Mall Garage.
7 Assumes that between 50 and 75 percent of all existing shuttle trips between Pacific Campus and other Campuses (Davies, California, Cathedral Hill) transfer to Cathedral Hill shuttle routes.
8 Assumes that approximately 10 percent of transit trips between the South Bay and Cathedral Hill Campus use Caltrain.
Sources: Data provided by CPMC and compiled by Fehr & Peers in 2010

4.5.4 IMPACT EVALUATIONS

◆ CATHEDRAL HILL CAMPUS

PROPOSED PROJECT AT CATHEDRAL HILL CAMPUS

Development of this proposed Cathedral Hill Campus would occur in the near term (2010–2015) and would involve five proposed components: the approximately 1,163,800-sq.-ft., 555-bed hospital Cathedral Hill Hospital; the approximately 491,300-sq.-ft. Cathedral Hill MOB; the Van Ness Avenue pedestrian tunnel (connecting the eastern portion of the proposed Cathedral Hill Hospital (at Level P3) to the western portion of the Cathedral Hill MOB (at Level G2); the 1375 Sutter MOB conversion; and streetscape improvements. All five project components would be completed in the near term and the facilities would be operational by mid-2015. No program-level, long-term (beyond 2015) project components for the proposed Cathedral Hill Campus are identified in the LRDP.

CATHEDRAL HILL CAMPUS PROPOSED SITE ACCESS

The main vehicular ingress to the hospital would be from the south side of the building along Geary Boulevard, with a new one-way (south to north) drive-through lane that would connect Geary Boulevard to Post Street at midblock. Drivers would either turn off at the adjacent nonemergency passenger drop-off area or descend to the 513-space parking garage. Vehicular ingress and egress would be provided via Post Street (see Figure 2-4, "Cathedral Hill Campus—Proposed Site Plan," page 2-53; and Figure 2-18, "Cathedral Hill Hospital—Level 2," page 2-75). Egress from the hospital would be restricted to Post Street; egress onto Geary Boulevard would be allowed only during emergency situations such as after an earthquake. The main pedestrian entrance would be from Van Ness Avenue. The vehicular entrance to the proposed Cathedral Hill Hospital's Emergency Department (located on Level 3) would be from Franklin Street and would allow ambulances and cars to conveniently drop off patients inside the building. Egress from the Emergency Department would be onto Post Street. A separate ambulance bay with access to the Emergency Department would be provided off Post Street, which would have ingress and egress onto Post Street. The proposed service vehicle and loading entrance would also be accessed from Franklin Street. The Post Street driveway into the parking garage would be a single ingress lane inbound and a single egress lane outbound, with a combined driveway not to exceed 22 feet in width. The Geary Boulevard driveway would be a single ingress lane inbound and a single emergency egress lane outbound, each not to exceed 12 feet in width. The emergency egress lane would be closed with a gate or a similar device across the driveway that would remain closed except during an emergency situation. The Geary Boulevard parking garage curb cut permit would be revocable, and this condition would be recorded as a Special Restriction on the deed of the Hospital.

The Cathedral Hill MOB would contain seven at- or below-grade parking levels (Levels G1–G7) that would provide 542 parking spaces. Vehicular ingress into the MOB garage would be provided via Geary Street and Cedar Street. Egress from the MOB garage would be allowed onto Cedar Street only. Cedar Street west of the MOB's parking garage driveway would be converted to a two-way operation. The Cedar Street driveway would be a single ingress lane inbound and a single egress lane outbound, with a combined driveway not to exceed 22 feet in width. The Geary Street driveway would be a single ingress lane, not to exceed 12 feet in width. The Geary Street parking garage curb cut permit would be revocable, and this condition shall be recorded as a Special Restriction on the deed of the MOB.

The 1375 Sutter MOB site is bordered by Sutter Street, which is one-way westbound; Franklin Street, which is one-way northbound; and Daniel Burnham Court, a two-way, midblock street that runs along the rear of the building and connects Franklin Street to Van Ness Avenue. Pedestrian and vehicular access to the site of the proposed 1375 Sutter MOB is currently available along Sutter Street and Franklin Street. Vehicular ingress-only would continue to be provided from Franklin Street and both ingress and egress via Sutter Street. This access would remain the same with implementation of the proposed LRDP.

Implementation of the Cathedral Hill Campus project would include the following changes to the street network:

- Provision of new driveways on Franklin and Post Streets for the off-street loading facility and Emergency Department;
- Sidewalk widening and provision of a recessed bay on Post Street between Franklin Street and Van Ness Avenue. The recessed bay would accommodate three CPMC shuttles and one commercial vehicle loading/unloading space. A driveway into the internal passenger zone and garage for the Cathedral Hill Hospital would be provided on Geary Boulevard and Post Street;
- Sidewalk widening on the west side of Van Ness Avenue adjacent to the project site. The existing bus stop at the southbound approach to Geary Boulevard would either be maintained at its current location, or relocated as part of the Van Ness Avenue BRT project south of Geary Street. The driveways into the existing Cathedral Hill Hotel would be eliminated;
- Sidewalk widening on the north side of Geary Boulevard between Van Ness Avenue and Franklin Street. An entry-only driveway into the internal passenger zone and garage for the Cathedral Hill Hospital would be provided;
- Relocation of the bus stop at the approach to Franklin Street to the far side of the intersection either as part of the proposed Geary Corridor BRT project or the Cathedral Hill Campus project;

- Relocation of the midblock bus stop on Geary Street between Van Ness Avenue and Polk Street, to west of Van Ness Avenue as part of the Cathedral Hill Campus project;
- Conversion of Cedar Street west of the proposed MOB's parking garage driveway to a two-way operation (would require elimination of all existing on-street parking spaces on Cedar Street). East of the garage driveway, Cedar Street would remain one-way eastbound;
- Provision of a passenger loading/unloading zone and new driveways into the Cathedral Hill MOB on Cedar Street;
- Conversion of the existing truck loading/unloading zone on Van Ness Avenue between Geary Street and Cedar Street to a passenger loading/unloading zone;
- Construction of raised crosswalks at the unsignalized intersections of Cedar Street at Van Ness Avenue and at Polk Street; and
- As part of the improvements at Polk Street, one parking space on Polk Street directly north of Cedar Street would be eliminated and a sidewalk extension would be constructed to improve sight distances.

The Cathedral Hill Campus impact analysis also considered the following two vehicle access variants, which are illustrated in Figure 4.5-16, "Cathedral Hill Campus Access" (page 4.5-91)

- **Two-Way Post Street Variant**—Under this variant, Post Street between Van Ness Avenue and Gough Street would be converted from one-way eastbound to a two-way operation (Post Street is currently a two-way street west of Gough Street and one-way eastbound east of Gough Street). The hospital driveway on Post Street would be reconfigured to allow full ingress and egress onto Post Street from both the eastbound and westbound directions. Also under this variant, access from Geary Boulevard would remain ingress-only.
- **MOB Access Variant**—Under this variant, Cedar Street between Van Ness Avenue and Polk Street would remain one-way eastbound, as under existing conditions. In addition, the MOB driveway on Geary Street would be reconfigured to allow full ingress *and egress* onto Geary Street. Under the MOB Access Variant, a 125-foot-long passenger loading/unloading zone would be provided on Cedar Street east of Van Ness Avenue, and the existing truck loading/unloading zone on Van Ness Avenue between Geary Street and Cedar Street would be changed to a passenger loading/unloading zone.

The Cathedral Hill Campus project also includes the following pedestrian access variant.

No Van Ness Avenue Pedestrian Tunnel Variant—Under this variant, the Van Ness Avenue pedestrian tunnel would be eliminated from the project. The No Van Ness Avenue Pedestrian Tunnel Variant is intended to provide flexibility, accommodating permit timing and other considerations. This variant is not CPMC's preference because it would create substantial operational, health care delivery, and efficiency problems. Specifically, the subsurface tunnel would no longer be available for doctors, staff, patients, and visitors to cross Van Ness Avenue, or for goods and materials to be transferred between the hospital and MOB. This project variant would instead require that patients, visitors, medical staff, and other employees cross Van Ness Avenue at the Post Street or Geary Boulevard/Geary Street intersections to travel between the proposed Cathedral Hill Hospital and the Cathedral Hill MOB.

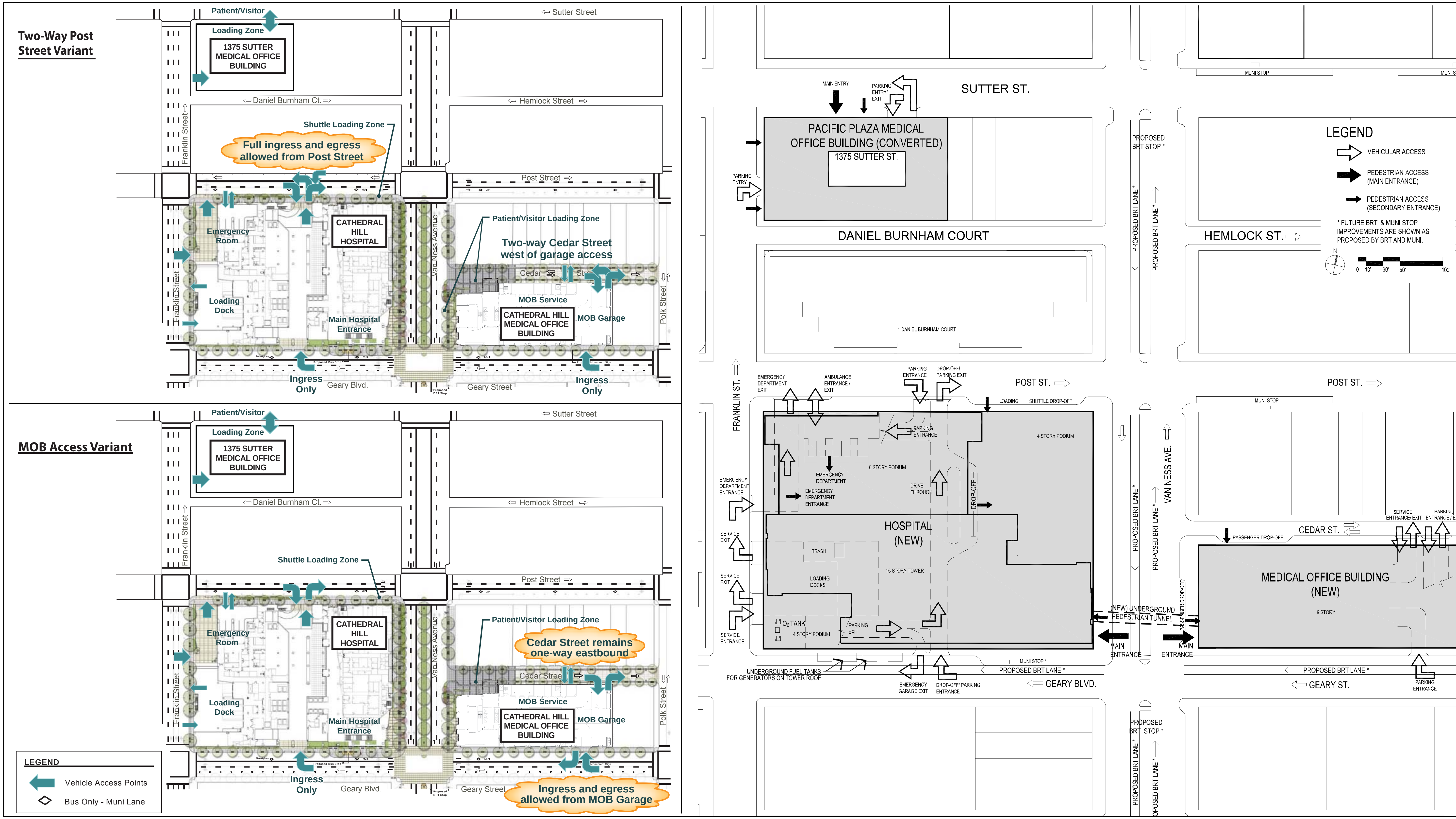
The conservative pedestrian and traffic analysis conducted for the Cathedral Hill Campus project did not assume construction of the tunnel but rather that all pedestrian trips between buildings would occur at street level.

Impacts associated with the proposed project at Cathedral Hill Campus are presented below. The following are the topics addressed and the impacts analyzed for those topics:

- *Traffic:* Impacts TR-1 through TR-23
- *Transit:* Impacts TR-24 through TR-36
- *Bicycle:* Impacts TR-37 through TR-39
- *Pedestrian:* Impacts TR-40 through TR-42
- *Loading:* Impacts TR-43 through TR-51
- *Emergency vehicle access:* Impacts TR-52 through TR-54
- *Construction:* Impacts TR-55 through TR-58

Overview of Project Traffic Impacts at the proposed Cathedral Hill Campus

The proposed Cathedral Hill Campus project would generate new vehicle trips and increase the number of vehicles and average delay per vehicle at the 26 study intersections during both the a.m. and p.m. peak hours. The proposed project would result in significant and unavoidable impacts at the intersections of Van Ness/Market and Polk/Geary, and feasible mitigation measures have not been identified. At six intersections that would operate poorly under 2015 Modified Baseline No Project and 2015 Modified Baseline plus Project conditions, the project contributions to the poor operating conditions would be less than significant (Gough/Geary, Franklin/O'Farrell, Franklin/Sutter, Franklin/Bush, Eighth/Market, and Octavia/Market/U.S. 101). Eighteen of the 26 study intersections would continue to operate at acceptable levels of LOS D or better under 2015 Modified Baseline plus Project conditions (Gough/Post, Gough/Sutter, Franklin/Geary, Franklin/Post, Franklin/Pine, Van Ness/Fell, Van Ness/Hayes, Van Ness/O'Farrell, Van Ness/Geary, Van Ness/Post, Van Ness/Sutter, Van Ness/Bush, Van Ness/Pine, Van Ness/Broadway, Polk/O'Farrell, Polk/Cedar, Polk/Post, and Polk/Sutter).



Source: SmithGroup, Fehr & Peers, AECOM 2010.

Cathedral Hill Campus Access **Figure 4.5-16**

The MOB Access Variant would result in the same impacts as under the proposed LRDP, except that it would result in a traffic hazard impact (see Impact TR-17 on page 4.5-110) at the proposed MOB's driveway onto Geary Street. Mitigation Measure MM-TR-17 would reduce but not eliminate this significant and unavoidable impact. Under the Two-Way Post Street Variant, conditions would be similar to the proposed LRDP, with the exception that the variant would result in a significant and unavoidable impact at one additional intersection (Franklin/Bush; see Impact TR-8 on page 4.5-105).

IMPACT TR-1

Implementation of the Cathedral Hill Campus project would result in a significant impact at the intersection of Van Ness/Market. (Significant and Unavoidable)

As discussed on page 4.5-55 under "Approach to Impact Analysis," the Cathedral Hill Campus project was determined to have a significant impact at an intersection if project-generated trips would cause an intersection operating at LOS D or better under the 2015 Modified Baseline No Project condition to operate at LOS E or LOS F, or intersection operating at LOS E under the 2015 Modified Baseline No Project Condition to deteriorate to LOS F conditions. At intersections that would operate at LOS E or LOS F under the 2015 Modified Baseline No Project Condition, and would continue to operate at LOS E or LOS F under 2015 Modified Baseline plus Project conditions, the increase in project vehicle trips were reviewed to determine whether the increase would contribute considerably to critical movements[29] operating at LOS E or LOS F.

The Cathedral Hill Campus project would result in an increase of 593 vehicle trips during the a.m. peak hour (508 inbound and 85 outbound trips), and 609 vehicle trips during the p.m. peak hour (42 inbound and 567 outbound trips). Table 4.5-17, "Levels of Service at Cathedral Hill Campus Study Intersections—A.M. Peak-Hour Conditions" (page 4.5-94), and Table 4.5-18, "Levels of Service at Cathedral Hill Campus Study Intersections—P.M. Peak-Hour Conditions" (page 4.5-95), present the intersection LOS for the 26 study intersections under 2015 Modified Baseline No Project conditions and 2015 Modified Baseline plus Project conditions for the a.m. and p.m. peak hours, respectively. The LOS conditions for the study intersections analyzed for 2015 Modified Baseline conditions are presented in Figure 4.5-17, "Cathedral Hill Campus—2015 Modified Baseline plus Project Conditions—Intersection Level of Service, A.M. Peak Hour" (page 4.5-96), for a.m. peak-hour conditions, and in Figure 4.5-18, "2015 Modified Baseline plus Project Conditions—Intersection Level of Service, P.M. Peak Hour" (page 4.5-97), for p.m. peak-hour conditions.

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[29] At an intersection, the critical movements are the traffic movements that operate with the highest volume to capacity ratio. In other words, the critical movements are the most congested movements.

Table 4.5-17
Levels of Service at Cathedral Hill Campus Study Intersections—A.M. Peak-Hour Conditions

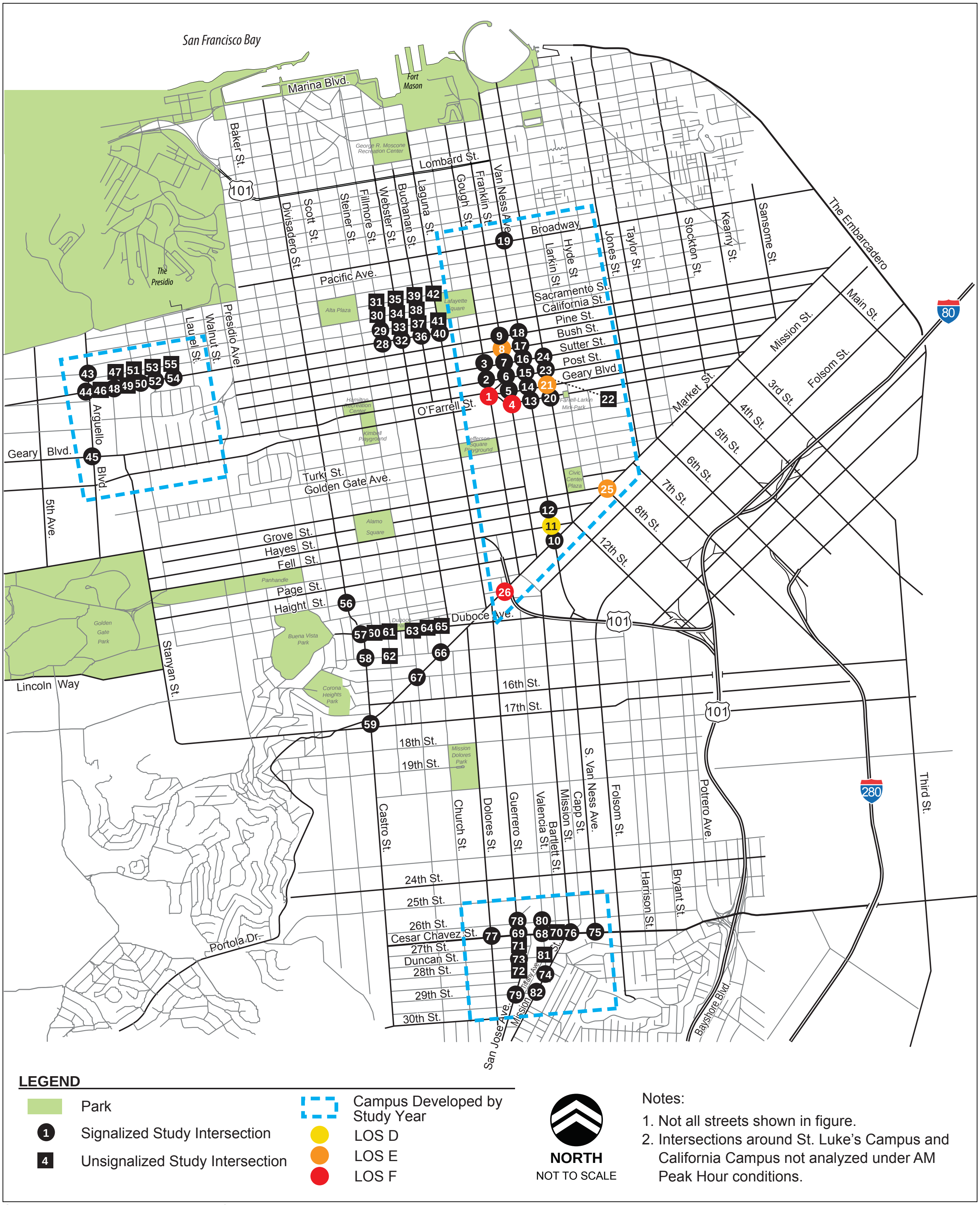
Intersection	Existing		Modified Baseline 2015				2030 Cumulative			
			2015 No Project		2015 Project		2030 No Project		2030 Project	
	Delay/v/c [1,2]	LOS	Delay/v/c	LOS	Delay/v/c	LOS	Delay/v/c	LOS	Delay/v/c	LOS
1. Gough/Geary	**>80/1.17**	**F**	**>80/1.18**	**F**	**>80/1.21**	**F**	**>80/1.23**	**F**	**>80/1.26**	**F**
2. Gough/Post	10.7	B	10.9	B	11.5	B	12.4	B	13.1	B
3. Gough/Sutter	9.5	A	8.4	A	9.1	A	8.4	A	8.9	A
4. Franklin/O'Farrell	**>80/1.23**	**F**	**>80/1.26**	**F**	**>80/1.31**	**F**	**>80/1.33**	**F**	**>80/1.38**	**F**
5. Franklin/Geary	8.7	A	9.1	A	9.2	A	10.5	B	11.1	B
6. Franklin/Post	15.2	B	13.4	B	14.9	B	16.3	B	18.4	B
7. Franklin/Sutter	17.0	B	13.9	B	13.6	B	19.8	B	19.3	C
8. Franklin/Bush	**71.4**	**E**	**78.3**	**E**	**79.9**	**E**	**>80/1.15**	**F**	**>80/1.15**	**F**
9. Franklin/Pine	12.6	B	13.4	B	13.5	B	14.7	B	14.7	B
10. Van Ness/Market	23.1	C	23.1	C	23.9	C	28.5	C	32.3	C
11. Van Ness/Fell	30.6	C	41.1	D	47.0	D	**63.0**	**E**	**70.5**	**E**
12. Van Ness/Hayes	20.5	C	19.4	B	19.3	B	19.7	B	19.7	B
13. Van Ness/O'Farrell	22.4	C	21.4	C	24.8	C	24.7	C	31.4	C
14. Van Ness/Geary	22.7	C	24.5	C	23.9	C	26.9	C	26.9	C
15.Van Ness/Post	15.3	B	15.0	B	15.2	B	15.9	B	16.1	B
16.Van Ness/Sutter	11.2	B	11.0	B	11.1	B	11.4	B	11.4	B
17.Van Ness/Bush	23.6	C	23.4	C	24.6	C	30.8	C	33.0	C
18.Van Ness/Pine	22.8	C	23.2	C	24.7	C	25.1	C	28.1	C
19.Van Ness/Broadway	28.0	C	34.4	C	35.1	C	45.5	D	46.8	D
20.Polk/O'Farrell	18.6	B	19.0	B	23.6	C	20.6	C	27.8	C
21.Polk/Geary	47.9	D	50.0	D	**57.4**	**E**	**59.1**	**E**	**66.0**	**E**
22.Polk/Cedar	14.6(eb)	B	14.7(eb)	C	15.5(eb)	C	14.7(eb)	C	15.5(eb)	C
23.Polk/Post	18.3	B	17.2	B	19.0	B	17.2	B	18.8	B
24.Polk/Sutter	27.5	C	23.8	C	31.3	C	22.5	C	28.9	C
25.Eighth/Market	**>80/0.87**	**F**	**78.8**	**E**	**79.5**	**E**	**76.4**	**E**	**77.1**	**E**
26.Octavia/Market/U.S. 101	**>80/1.18**	**F**	**>80/1.21**	**F**	**>80/1.20**	**F**	**>80/1.31**	**F**	**>80/1.31**	**F**

Notes:
1 Delay presented in seconds per vehicle. For unsignalized intersections, delay and LOS presented for worst approach. Worst approach indicated in ( ).
2 Intersections operating at LOS E or LOS F conditions highlighted in **bold,** and overall intersection volume-to-capacity (v/c) ratio is presented for LOS F conditions.
Source: Fehr & Peers 2010

Table 4.5-18
Levels of Service at Cathedral Hill Campus Study Intersections—P.M. Peak-Hour Conditions

Intersection	Existing		Modified Baseline 2015				2030 Cumulative			
			2015 No Project		2015 Project		2030 No Project		2030 Project	
	Delay/v/c [1,2]	LOS	Delay/v/c	LOS	Delay/v/c	LOS	Delay/v/c	LOS	Delay/v/c	LOS
1. Gough/Geary	29.9	C	36.2	D	41.0	D	46.9	D	51.7	D
2. Gough/Post	8.6	A	10.0	A	10.9	B	12.7	B	14.4	B
3. Gough/Sutter	15.0	B	15.5	B	19.6	C	20.8	C	26.2	C
4. Franklin/O'Farrell	30.7	C	34.1	C	33.5	C	46.7	D	45.9	D
5. Franklin/Geary	22.1	C	28.8	C	26.7	C	47.7	D	45.2	D
6. Franklin/Post	12.3	B	11.0	B	11.3	B	13.3	B	13.7	B
7. Franklin/Sutter	**65.5**	**E**	**57.0**	**E**	**56.4**	**E**	**66.1**	**E**	**65.5**	**E**
8. Franklin/Bush	9.7	A	10.1	A	10.2	B	10.4	A	10.6	B
9. Franklin/Pine	16.8	B	20.2	B	25.6	B	27.7	C	35.9	D
10. Van Ness/Market	49.1	D	54.9	D	**55.1**	**E**	**73.1**	**E**	**74.2**	**E**
11. Van Ness/Fell	23.3	C	25.1	C	25.0	C	35.2	D	35.1	D
12. Van Ness/Hayes	23.3	C	25.7	C	26.8	C	37.1	D	39.5	D
13. Van Ness/O'Farrell	26.3	C	26.5	C	26.7	C	33.2	C	33.4	C
14. Van Ness/Geary	26.3	C	40.2	D	35.9	D	**64.2**	**E**	**57.8**	**E**
15.Van Ness/Post	14.4	B	14.8	B	15.6	B	16.7	B	17.6	B
16.Van Ness/Sutter	16.9	B	17.4	B	17.6	B	24.9	C	25.2	C
17.Van Ness/Bush	26.6	C	28.7	C	36.7	C	39.3	D	49.5	D
18.Van Ness/Pine	23.2	C	33.7	C	40.5	C	54.6	D	**59.7**	**E**
19.Van Ness/Broadway	26.0	C	28.0	C	27.8	C	30.7	C	30.8	C
20.Polk/O'Farrell	18.3	B	20.0	B	28.7	C	21.1	C	30.4	C
21.Polk/Geary	28.6	C	34.4	C	**59.8**	**E**	54.8	D	**76.0**	**E**
22.Polk/Cedar	12.3(eb)	B	13.0(eb)	B	24.1(eb)	C	13.1(eb)	B	24.3(eb)	C
23.Polk/Post	15.9	B	16.1	B	16.9	B	17.9	B	19.1	B
24.Polk/Sutter	28.7	C	29.7	C	30.0	C	49.0	D	48.8	D
25.Eighth/Market	**70.0**	**E**	**>80/1.18**	**F**	**>80/1.19**	**F**	**>80/1.28**	**F**	**>80/1.29**	**F**
26.Octavia/Market/U.S. 101	38.7	D	49.3	D	49.8	D	**>80/1.02**	**F**	**>80/1.02**	**F**

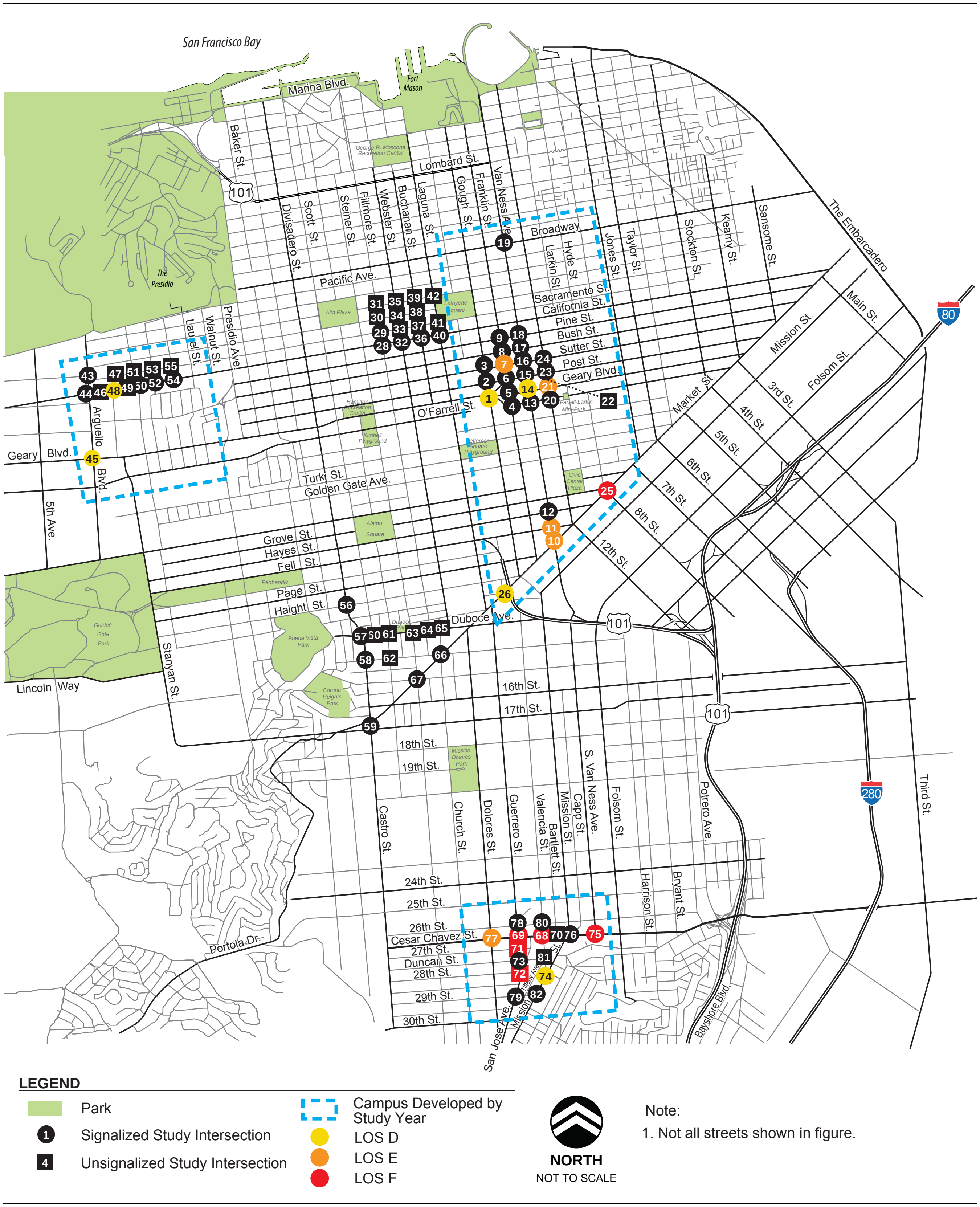
Notes:
1 Delay presented in seconds per vehicle. For unsignalized intersections, delay and LOS presented for worst approach. Worst approach indicated in ( ).
2 Intersections operating at LOS E or LOS F conditions highlighted in **bold,** and overall intersection volume-to-capacity (v/c) ratio is presented for LOS F conditions.
Source: Data compiled by Fehr & Peers in 2010



Source: Data compiled by Fehr & Peers in 2010

Cathedral Hill Campus—2015 Modified Baseline plus Project Conditions—Intersection Level of Service, A.M. Peak Hour

Figure 4.5-17



Source: Data compiled by Fehr & Peers in 2010

**2015 Modified Baseline plus Project Conditions—
Intersection Level of Service, P.M. Peak Hour**

Figure 4.5-18

- The proposed Cathedral Hill Campus project would result in project-specific impacts at two study intersections that operate at LOS D or better under 2015 Modified Baseline conditions and would deteriorate to LOS E or LOS F under 2015 Modified Baseline plus Project conditions, or that operate at LOS E under 2015 Modified Baseline conditions, and would deteriorate to LOS F under 2015 Modified Baseline plus Project conditions (Impacts TR-1 and TR-2).

- The proposed Cathedral Hill project would have less than significant contributions at six study intersections that operate at LOS E or LOS F under 2015 Modified Baseline conditions and would continue to operate at LOS E or LOS F under 2015 Modified Baseline plus Project conditions (Impact TR-3).

- The proposed Cathedral Hill project would have less-than-significant impacts at 18 study intersections that would operate at LOS D or better under 2015 Modified Baseline plus Project conditions (Impact TR-4).

During the p.m. peak hour, the addition of the proposed LRDP project trips would degrade operations at the signalized intersection of Van Ness/Market from LOS D under 2015 Modified Baseline No Project conditions, to LOS E under 2015 Modified Baseline plus Project conditions (see Table 4.5-18, page 4.5-95). **This would be considered a significant traffic impact.**

Providing additional traffic lanes or otherwise increasing vehicular capacity at this intersection is not feasible because it would require narrowing of sidewalks to substandard widths, and/or demolition of buildings adjacent these streets. Signal timing adjustments may improve intersection operations, but would likely be infeasible due to traffic, transit or pedestrian signal timing requirements. Therefore, no feasible mitigation measures have been identified to reduce project impacts to less-than-significant levels. CPMC has indicated that it is planning on expanding its current TDM program to discourage use of private automobile; although this may reduce the number of trips through this intersection, the extent of this program or reduction to impacts is not known. **The traffic impact at the intersection of Van Ness/Market would therefore, remain significant and unavoidable.**

IMPACT TR-2

Implementation of the Cathedral Hill Campus project would result in a significant impact at the intersection of Polk/Geary. (Significant and Unavoidable)

The addition of the proposed LRDP project trips would degrade operations at the signalized intersection of Polk/Geary from LOS D under 2015 Modified Baseline No Project conditions, to LOS E under 2015 Modified Baseline plus Project conditions during the a.m. peak hour, and from LOS C under 2015 Modified Baseline No Project conditions to LOS E under 2015 Modified Baseline plus Project conditions during the p.m. peak hour. **This would be considered a significant traffic impact.**

Providing additional traffic lanes or otherwise increasing vehicular capacity at this intersection is not feasible because it would require narrowing of sidewalks to substandard widths, and/or demolition of buildings adjacent to these streets. Signal timing adjustments may improve intersection operations, but would likely be infeasible due to traffic, transit or pedestrian signal timing requirements. CPMC has indicated that it is planning on expanding its current TDM program to discourage use of private automobile; although this may reduce the number of trips through this intersection, the extent of this program or potential reduction to impacts is not known. Therefore, no feasible mitigation measures have been identified to reduce project impacts to less-than-significant levels. **The traffic impact at the intersection of Polk/Geary would remain significant and unavoidable.**

IMPACT TR-3 *Implementation of the Cathedral Hill Campus project would have a less-than-significant impact at six study intersections that would operate at LOS E or LOS F under 2015 Modified Baseline No Project conditions and 2015 Modified Baseline plus Project conditions. (Less than Significant)*

As indicated in Table 4.5-17, “Levels of Service at Cathedral Hill Campus Study Intersections—A.M. Peak-Hour Conditions” (page 4.5-94), and Table 4.5-18, “Levels of Service at Cathedral Hill Campus Study Intersections—P.M. Peak-Hour Conditions” (page 4.5-95), the intersection LOS at six of the 26 study intersections would operate at LOS E or LOS F under 2015 Modified Baseline No Project conditions, and would continue to operate at the same LOS under 2015 Modified Baseline plus Project conditions. The six intersections include:

- Gough/Geary (LOS F during a.m. peak hour)
- Franklin/O’Farrell (LOS F during a.m. peak hour)
- Franklin/Sutter (LOS E during p.m. peak hour)
- Franklin/Bush (LOS E during a.m. peak hour)
- 8th/Market (LOS E during a.m. peak hour, and LOS F during p.m. peak hour)
- Octavia/Market/U.S. 101 (LOS F during a.m. peak hour)

The increase in vehicle trips at these six intersections by the proposed Cathedral Hill Campus project was reviewed to determine whether the project’s increase would contribute considerably to critical movements operating at LOS E or LOS F at these intersections. Based on this examination, the project’s contributions at these intersections were determined to be less than significant. The poor operating conditions at these study intersections would be due to background traffic volume increases associated with other developments in the Project vicinity. Since the proposed Cathedral Hill Campus project would not contribute significantly to the poor operating conditions, **the project-related traffic impact would be less than significant**.

IMPACT TR-4 *Implementation of the Cathedral Hill Campus project would have less-than-significant impacts at 18 study intersections that would operate at LOS D or better under 2015 Modified Baseline plus Project conditions. (Less than Significant)*

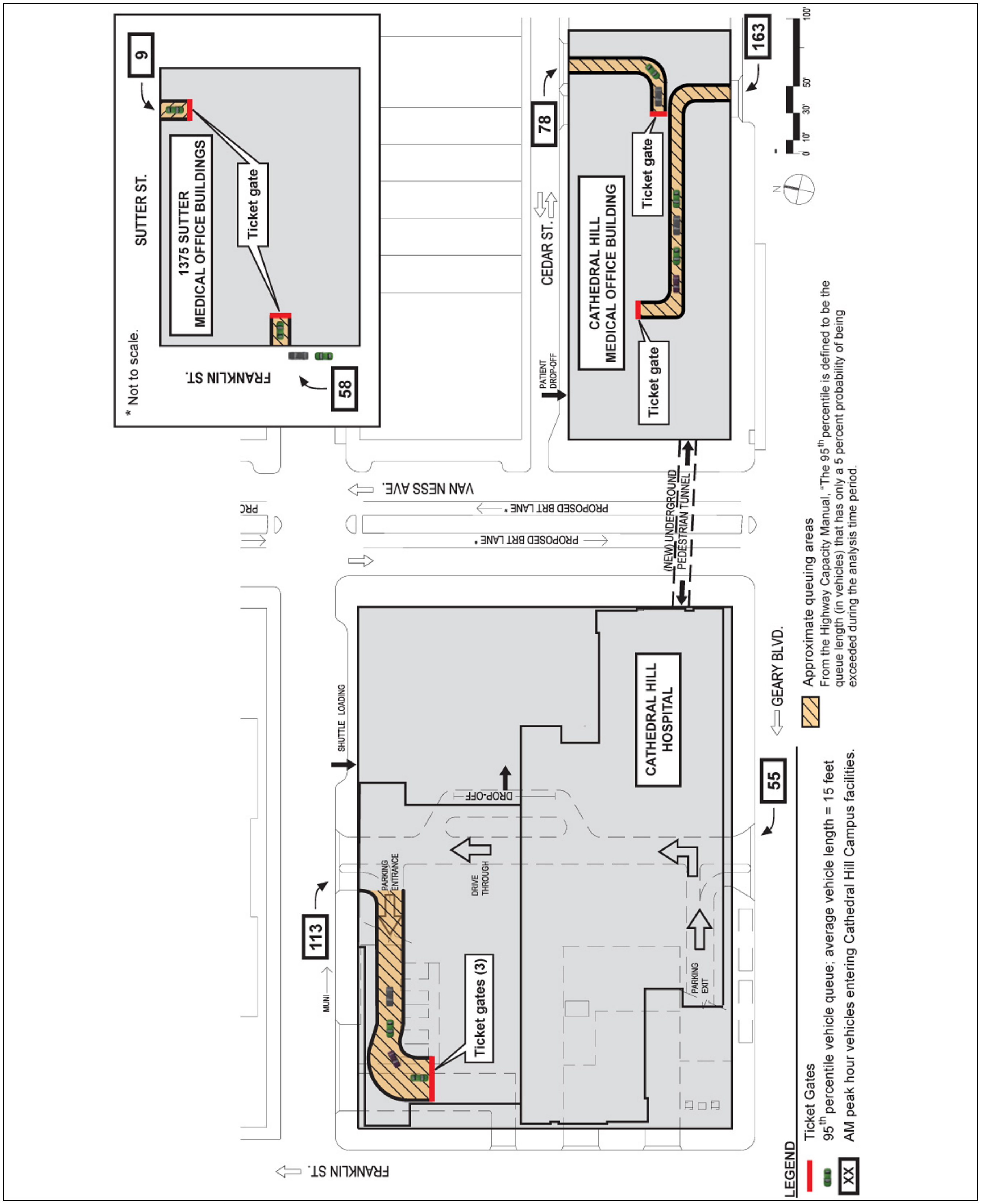
With implementation of the Cathedral Hill Campus project, the following 18 study intersections would continue to operate at LOS D or better during the a.m. and p.m. peak hours **and, therefore, traffic impacts at these locations would be less than significant:**

- Gough/Post
- Gough/Sutter
- Franklin/Geary
- Franklin/Post
- Franklin/Pine
- Van Ness/Fell
- Van Ness/Hayes
- Van Ness/O'Farrell
- Van Ness/Geary
- Van Ness/Post
- Van Ness/Sutter
- Van Ness/Bush
- Van Ness/Pine
- Van Ness/Broadway
- Polk/O'Farrell
- Polk/Cedar
- Polk/Post
- Polk/Sutter

IMPACT TR-5 *Operation of the Cathedral Hill Campus parking garages would have a less-than-significant impact on traffic operations because inbound peak period queues would not spill back into adjacent travel lanes. (Less than Significant)*

A queuing analysis was conducted to determine whether vehicles entering the proposed Cathedral Hill Campus parking garages would queue out into the adjacent travel lanes. The queuing analysis was conducted for the a.m. peak-hour conditions, when most vehicles would be entering the garage, and considered that all vehicle trips would be destined to the garages (in some instances patients may be dropped off and picked up without a vehicle entering and parking at one of the CPMC garages, while some visitors may park on-street). At each of the three Cathedral Hill Campus garages (Cathedral Hill Hospital, Cathedral Hill MOB, and 1375 Sutter MOB), the 95th percentile queue from the ticket machine was calculated, which identifies the queue length that would not be exceeded for 95 percent of the time during the peak hour. Figure 4.5-19, "Cathedral Hill Campus—Garage Entrance Queues" (page 4.5-103), illustrates the projected queues at the hospital and MOB garage entrances. Additional details are presented in the *CPMC LRDP Cathedral Hill Campus Transportation Impact Study*.

- **Cathedral Hill Hospital Garage**—The parking garage would have three entry gates with automated ticket machines located approximately 150 linear feet from the midblock Post Street driveway entrance. The 95th percentile queues would be accommodated within the garage and are not expected to occur on the street.



Source: Data compiled by Fehr & Peers in 2010

Cathedral Hill Campus—Garage Entrance Queues **Figure 4.5-19**

- **Cathedral Hill MOB Garage**—Both driveways into this garage would have one entry gate, with the Geary entry access gate located 225 feet from Geary Street, and the Cedar entry access gate located 100 feet from Cedar Street. The 95th percentile queue would be fewer than four vehicles at either entry.

- **1375 Sutter MOB Garage**—Both driveways into this garage would have one entry gate, with the Sutter and Franklin entry access gates located 20 feet from the street. The 95th percentile queues at both locations would be three vehicles. During the a.m. peak hour, the queue would extend onto Franklin Street; however, it would be accommodated within the red-curb with queuing space for two vehicles that is currently provided along Franklin Street upstream of the garage entrance.

Since the 95th percentile queue could be accommodated at all three Cathedral Hill Campus garages, **the traffic impact of spillback into adjacent traffic lanes from the garage operations would be less than significant**.

IMPACT TR-6 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would result in a significant impact at the intersection of Van Ness/Market. (Significant and Unavoidable)*

The Two-Way Post Street Variant would convert Post Street between Gough Street and Van Ness Avenue from one-way eastbound operation to two-way operation. The hospital driveway on Post Street would be reconfigured to allow full ingress and egress onto Post Street from both the eastbound and westbound directions.

Table 4.5-19, "Levels of Service at Cathedral Hill Campus Study Intersections for Project Access Variants—A.M. Peak-Hour Conditions" (page 4.5-103), and Table 4.5-20, "Levels of Service at Cathedral Hill Campus Study Intersections for Project Access Variant—P.M. Peak-Hour Conditions" (page 4.5-104), present the intersection LOS for the 26 study intersections under 2015 Modified Baseline plus Project conditions for the a.m. and p.m. peak hours, respectively.

- The Two-Way Post Street Variant would result in project-specific impacts at three study intersections that operate at LOS D or better under 2015 Modified Baseline conditions and would deteriorate to LOS E or LOS F under 2015 Modified Baseline plus Project conditions, or that operate at LOS E under 2015 Modified Baseline conditions and would deteriorate to LOS F under 2015 Modified Baseline plus Project conditions (Impacts TR-6 through TR-8).

- The Two-Way Post Street Variant would have less than significant contributions at five study intersections that operate at LOS E or LOS F under 2015 Modified Baseline conditions and would continue to operate at LOS E or LOS F under 2015 Modified Baseline plus Project conditions (Impact TR-9).

Table 4.5-19
Levels of Service at Cathedral Hill Campus Study Intersections for Project Access Variants—A.M. Peak-Hour Conditions

Intersection	Modified Baseline 2015						2030 Cumulative					
	2015 No Project		Two-Way Post Street Variant		MOB Access Variant		2030 No Project		Two-Way Post Street Variant		MOB Access Variant	
	Delay/v/c [1,2]	LOS	Delay/v/c	LOS	Delay/v/c	LOS	Delay/v/c	LOS	Delay/v/c	LOS	Delay/v/c	LOS
1. Gough/Geary	**>80/1.18**	**F**	**>80/1.21**	**F**	**>80/1.21**	**F**	**>80/1.23**	**F**	**>80/1.26**	**F**	**>80/1.26**	**F**
2. Gough/Post	10.9	B	18.7	B	11.5	B	12.4	B	27.1	C	13.1	B
3. Gough/Sutter	8.4	A	9.1	A	9.1	A	8.4	A	8.9	A	8.9	A
4. Franklin/O'Farrell	**>80/1.26**	**F**	**>80/1.31**	**F**	**>80/1.31**	**F**	**>80/1.33**	**F**	**>80/1.38**	**F**	**>80/1.38**	**F**
5. Franklin/Geary	9.1	A	9.2	A	9.2	A	10.5	B	11.0	B	11.1	B
6. Franklin/Post	13.4	B	16.6	B	14.9	B	16.3	B	20.9	C	18.4	B
7. Franklin/Sutter	13.9	B	13.9	B	13.6	B	19.8	B	19.8	C	19.3	C
8. Franklin/Bush	**78.3**	**E**	**>80/1.13**	**F**	**79.9**	**E**	**>80/1.15**	**F**	**>80/1.15**	**F**	**>80/1.15**	**F**
9. Franklin/Pine	13.4	B	13.5	B	13.5	B	14.7	B	14.8	B	14.7	B
10. Van Ness/Market	23.1	C	23.9	C	23.9	C	28.5	C	32.3	C	32.3	C
11. Van Ness/Fell	41.1	D	47.0	D	47.0	D	**63.0**	**E**	**70.5**	**E**	**70.5**	**E**
12. Van Ness/Hayes	19.4	B	19.3	B	19.3	B	19.7	B	19.7	B	19.7	B
13. Van Ness/O'Farrell	21.4	C	24.8	C	24.8	C	24.7	C	31.4	C	31.4	C
14. Van Ness/Geary	24.5	C	23.4	C	23.9	C	26.9	C	26.5	C	26.9	C
15.Van Ness/Post	15.0	B	12.3	B	15.2	B	15.9	B	16.2	B	16.1	B
16.Van Ness/Sutter	11.0	B	11.1	B	11.1	B	11.4	B	11.4	B	11.4	B
17.Van Ness/Bush	23.4	C	24.5	C	24.6	C	30.8	C	32.6	C	33.0	C
18.Van Ness/Pine	23.2	C	24.7	C	24.7	C	25.1	C	28.1	C	28.1	C
19.Van Ness/Broadway	34.4	C	34.9	C	35.1	C	45.5	D	46.8	D	46.8	D
20.Polk/O'Farrell	19.0	B	23.6	C	23.5	C	20.6	C	27.8	C	27.8	C
21.Polk/Geary	50.0	D	**57.4**	**E**	**57.4**	**E**	**59.1**	**E**	**66.0**	**E**	**66.0**	**E**
22.Polk/Cedar	14.7(eb)	C	15.5(eb)	C	16.2(eb)	C	14.7(eb)	C	15.5(eb)	C	16.2(eb)	C
23.Polk/Post	17.2	B	19.0	B	19.0	B	17.2	B	18.8	B	18.8	B
24.Polk/Sutter	23.8	C	31.3	C	31.3	C	22.5	C	28.9	C	28.9	C
25.Eighth/Market	**78.8**	**E**	**79.5**	**E**	**79.5**	**E**	**76.4**	**E**	**77.1**	**E**	**77.1**	**E**
26.Octavia/Market/U.S. 101	**>80/1.21**	**F**	**>80/1.20**	**F**	**>80/1.20**	**F**	**>80/1.31**	**F**	**>80/1.31**	**F**	**>80/1.31**	**F**

Notes:
1 Delay presented in seconds per vehicle. For unsignalized intersections, delay and LOS presented for worst approach. Worst approach indicated in ( ).
2 Intersections operating at LOS E or LOS F conditions highlighted in **bold,** and overall intersection volume-to-capacity (v/c) ratio is presented for LOS F conditions.
Source: Fehr & Peers 2010

Table 4.5-20
Levels of Service at Cathedral Hill Campus Study Intersections for Project Access Variants—P.M. Peak-Hour Conditions

Intersection	Modified Baseline 2015						2030 Cumulative					
	2015 No Project		Two-Way Post Street Variant		MOB Access Variant		2030 No Project		Two-Way Post St. Variant		MOB Access Variant	
	Delay/v/c [1,2]	LOS	Delay/v/c	LOS	Delay/v/c	LOS	Delay/v/c	LOS	Delay/v/c	LOS	Delay/v/c	LOS
1. Gough/Geary	36.2	D	45.1	D	41.0	D	46.9	D	**55.1**	**E**	51.7	D
2. Gough/Post	10.0	A	30.8	C	10.9	B	12.7	B	51.3	D	14.4	B
3. Gough/Sutter	15.5	B	19.6	C	19.6	C	20.8	C	26.2	C	26.2	C
4. Franklin/O'Farrell	34.1	C	33.5	C	33.5	C	46.7	D	45.9	D	45.9	D
5. Franklin/Geary	28.8	C	26.6	C	26.7	C	47.7	D	45.1	D	45.2	D
6. Franklin/Post	11.0	B	12.6	B	11.3	B	13.3	B	15.4	B	13.7	B
7. Franklin/Sutter	**57.0**	**E**	**59.4**	**E**	**56.4**	**E**	**66.1**	**E**	**68.5**	**E**	**65.5**	**E**
8. Franklin/Bush	10.1	A	10.3	A	10.2	B	10.4	A	10.7	A	10.6	B
9. Franklin/Pine	20.2	B	26.0	B	25.6	B	27.7	C	36.9	D	35.9	D
10. Van Ness/Market	54.9	D	**55.1**	**E**	**55.1**	**E**	**73.1**	**E**	**74.2**	**E**	**74.2**	**E**
11. Van Ness/Fell	25.1	C	25.0	C	25.0	C	35.2	D	35.1	D	35.1	D
12. Van Ness/Hayes	25.7	C	26.8	C	26.8	C	37.1	D	39.5	D	39.5	D
13. Van Ness/O'Farrell	26.5	C	26.7	C	26.7	C	33.2	C	33.4	C	33.4	C
14. Van Ness/Geary	40.2	D	33.0	C	35.9	D	**64.2**	**E**	54.0	D	**57.5**	**E**
15.Van Ness/Post	14.8	B	16.1	B	15.6	B	16.7	B	20.0	B	17.6	B
16.Van Ness/Sutter	17.4	B	17.6	B	17.6	B	24.9	C	25.2	C	25.2	C
17.Van Ness/Bush	28.7	C	35.0	C	36.7	C	39.3	D	47.8	D	49.5	D
18.Van Ness/Pine	33.7	C	39.8	C	40.5	C	54.6	D	**58.8**	**E**	**59.7**	**E**
19.Van Ness/Broadway	28.0	C	27.9	C	27.8	C	30.7	C	30.8	C	30.8	C
20.Polk/O'Farrell	20.0	B	28.7	B	28.7	C	21.1	C	30.4	C	30.4	C
21.Polk/Geary	34.4	C	**59.8**	**E**	**59.8**	**E**	54.8	D	**76.0**	**E**	**76.0**	**E**
22.Polk/Cedar	13.0(eb)	B	24.1(eb)	B	24.1(eb)	C	13.1(eb)	B	24.3(eb)	B	24.3(eb)	C
23.Polk/Post	16.1	B	16.9	B	16.9	B	17.9	B	19.1	B	19.1	B
24.Polk/Sutter	29.7	C	30.0	C	30.0	C	49.0	D	48.8	D	48.8	D
25.Eighth/Market	**>80/1.18**	**F**	**>80/1.19**	**F**	**>80/1.19**	**F**	**>80/1.28**	**F**	**>80/1.29**	**F**	**>80/1.29**	**F**
26.Octavia/Market/U.S. 101	49.3	D	49.8	D	49.8	D	**>80/1.02**	**F**	**>80/1.02**	**F**	**>80/1.02**	**F**

Notes:
[1] Delay presented in seconds per vehicle. For unsignalized intersections, delay and LOS presented for worst approach. Worst approach indicated in ( ).
[2] Intersections operating at LOS E or LOS F conditions highlighted in **bold,** and overall intersection volume-to-capacity (v/c) ratio is presented for LOS F conditions.
Source: Data compiled by Fehr & Peers in 2010

- The Two-Way Post Street Variant would have less-than-significant impacts at 18 study intersections that would operate at LOS D or better under 2015 Modified Baseline plus Project conditions (Impact TR-10).

Compared with the project, the two-way Post Street Variant would result in an impact at one additional intersection beyond those identified for the project. During the p.m. peak hour, the addition of the proposed Cathedral Hill Campus project trips with the Two-Way Post Street Variant would degrade operations at the signalized intersection of Van Ness/Market from LOS D under 2015 Modified Baseline No Project conditions, to LOS E under 2015 Modified Baseline plus Project conditions. **This would be considered a significant traffic impact.**

As discussed in Impact TR-1 above, no feasible mitigation measures have been identified to reduce the project impact at this intersection to a less-than-significant level. **Therefore, the Two-Way Post Street Variant-related traffic impact at the intersection of Van Ness/Market would remain significant and unavoidable.**

IMPACT TR-7

Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would result in a significant impact at the intersection of Polk/Geary. (Significant and Unavoidable)

Under 2015 Modified Baseline conditions with the Two-Way Post Street Variant, the addition of the proposed Cathedral Hill Campus project trips would degrade operations at the signalized intersection of Polk/Geary from LOS D under 2015 Modified Baseline No Project conditions, to LOS E under 2015 Modified Baseline plus Project conditions during the a.m. peak hour, and from LOS C under 2015 Modified Baseline No Project conditions to LOS E under 2015 Modified Baseline plus Project conditions during the p.m. peak hour. **This would be considered a significant traffic impact.**

As discussed in Impact TR-2 above, no feasible mitigation measures have been identified to reduce the project impact at this intersection to a less-than-significant level. Therefore, **the Two-Way Post Street Variant-related traffic impact at the intersection of Polk/Geary would remain significant and unavoidable**.

IMPACT TR-8

Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would result in a significant impact at the intersection of Franklin/Bush. (Significant and Unavoidable)

Under 2015 Modified Baseline conditions with the Two-Way Post Street Variant, the addition of the proposed Cathedral Hill Campus project trips would degrade operations at the signalized intersection of Franklin/Bush from

LOS E under 2015 Modified Baseline No Project conditions, to LOS F under 2015 Modified Baseline plus Project conditions during the a.m. peak hour. **This would be considered a significant traffic impact.**

No feasible mitigation measures have been identified to reduce the project impact at this intersection to a less-than-significant level. Therefore, **the Two-Way Post Street Variant-related traffic impact at the intersection of Franklin/Bush would remain significant and unavoidable**.

IMPACT TR-9 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would have a less-than-significant impact at five study intersections that would operate at LOS E or LOS F under 2015 Modified Baseline No Project conditions and 2015 Modified Baseline plus Project conditions. (Less than Significant)*

Under the Two-Way Post Street Variant conditions, the intersection LOS at five of the 26 study intersections would operate at LOS E or LOS F under 2015 Modified Baseline No Project conditions, and would continue to operate at the same LOS under 2015 Modified Baseline plus Project conditions. The five intersections include:

- Gough/Geary (LOS F during a.m. peak hour)
- Franklin/O’Farrell (LOS F during a.m. peak hour)
- Franklin/Sutter (LOS E during p.m. peak hour)
- 8th/Market (LOS E during a.m. peak hour, and LOS F during p.m. peak hour)
- Octavia/Market/U.S. 101 (LOS F during a.m. peak hour)

The increase in vehicle trips at these five intersections by the proposed Cathedral Hill Campus project was reviewed to determine whether the project’s increase would contribute considerably to critical movements operating at LOS E or LOS F at these intersections. Based on this examination, the project’s contributions at these intersections were determined to be less than significant. Because the proposed Cathedral Hill Campus project Two-Way Post Street Variant would not contribute significantly to the poor operating conditions at these intersections, the **Two-Way Post Street Variant–related traffic impact would be less than significant**.

IMPACT TR-10 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would have less-than-significant impacts at 18 study intersections that would operate at LOS D or better under 2015 Modified Baseline plus Project conditions. (Less than Significant)*

With implementation of the Two-Way Post Street Variant, the following 18 study intersections would continue to operate at LOS D or better during the a.m. and p.m. peak hours and, therefore, **traffic impacts at these locations would be less than significant:**

- Gough/Post
- Gough/Sutter
- Franklin/Geary
- Franklin/Post
- Franklin/Pine
- Van Ness/Fell
- Van Ness/Hayes
- Van Ness/O'Farrell
- Van Ness/Geary
- Van Ness/Post
- Van Ness/Sutter
- Van Ness/Bush
- Van Ness/Pine
- Van Ness/Broadway
- Polk/O'Farrell
- Polk/Cedar
- Polk/Post
- Polk/Sutter

IMPACT TR-11 *With implementation of the Two-Way Post Street Variant, the operation of the hospital parking garage at the Cathedral Hill campus would have less-than-significant impacts on traffic operations since inbound peak period queues would not spill back into adjacent travel lanes. (Less than Significant)*

The Two-Way Post Street Variant would convert Post Street between Gough Street and Van Ness Avenue from a one-way eastbound operation to a two-way operation, and access into the hospital driveway on Post Street would be possible from both the eastbound and westbound directions. The reconfiguration of Post Street would not substantially change the number of vehicles accessing the hospital via the Post Street driveway and, similar to the Cathedral Hill Campus project described in Impact TR-5, the 95th percentile queue would be accommodated. The Two-Way Post Street Variant would not affect the operations of the proposed Cathedral Hill MOB garage or the 1375 Sutter MOB garage.

Since the 95th percentile queue could be accommodated at all three proposed Cathedral Hill campus garages, **the potential traffic impact of spillback into adjacent traffic lanes from the garage operations would be less than significant**.

IMPACT TR-12 *Implementation of the Cathedral Hill Campus project MOB Access Variant would result in a significant impact at the intersection of Van Ness/Market. (Significant and Unavoidable)*

Under the MOB Access Variant, Cedar Street between Van Ness Avenue and Polk Street would remain one-way eastbound as under existing conditions. In addition, the MOB driveway on Geary Street would be reconfigured to allow full ingress and egress onto Geary Street. Table 4.5-19, "Levels of Service at Cathedral Hill Campus Study Intersections for Project Access Variants—A.M. Peak-Hour Conditions" (page 4.5-103), and Table 4.5-20, "Levels of Service at Cathedral Hill Campus Study Intersections for Project Access Variant—P.M. Peak-Hour Conditions" (page 4.5-104), present the intersection LOS for the 26 study intersections under 2015 Modified

Baseline plus Project conditions for the a.m. and p.m. peak hours, respectively. Under the MOB Access Variant, impacts at the study intersections would be the same as for the proposed Cathedral Hill Campus project.

- The MOB Access Variant would result in project-specific impacts at two study intersections that operate at LOS D or better under 2015 Modified Baseline conditions and would deteriorate to LOS E or LOS F under 2015 Modified Baseline plus Project conditions, or that operate at LOS E under 2015 Modified Baseline conditions and would deteriorate to LOS F under 2015 Modified Baseline plus Project conditions (Impacts TR-12 and TR-13).
- The MOB Access Variant would have less than significant contributions at six study intersections that operate at LOS E or LOS F under 2015 Modified Baseline conditions and would continue to operate at LOS E or LOS F under 2015 Modified Baseline plus Project conditions (Impact TR-14).
- The MOB Access Variant would have less-than-significant impacts at 18 study intersections that would operate at LOS D or better under 2015 Modified Baseline plus Project conditions (Impact TR-15).

Under the MOB Access Variant, the addition of the proposed LRDP project trips would degrade operations at the signalized intersection of Van Ness/Market from LOS D under 2015 Modified Baseline No Project conditions, to LOS E under 2015 Modified Baseline plus Project conditions in the p.m. peak hour. **This would be considered a significant traffic impact.**

As discussed in Impact TR-1 above, no feasible mitigation measures have been identified to reduce the project impact at this intersection to a less-than-significant level. **Therefore, the MOB Access Variant-related traffic impact at the intersection of Van Ness/Market would remain significant and unavoidable.**

IMPACT TR-13

Implementation of the Cathedral Hill Campus project MOB Access Variant would result in a significant impact at the intersection of Polk/Geary. (Significant and Unavoidable)

Under 2015 Modified Baseline conditions with the MOB Access Variant, the addition of the proposed Cathedral Hill Campus project trips would degrade operations at the signalized intersection of Polk/Geary from LOS D under 2015 Modified Baseline No Project conditions, to LOS E under 2015 Modified Baseline plus Project conditions during the a.m. peak hour. **This would be considered a significant traffic impact.**

As discussed in Impact TR-2 above, no feasible mitigation measures have been identified to reduce the project impact at this intersection to a less-than-significant level. Therefore, the **MOB Access Variant-related traffic impact at the intersection of Polk/Geary would remain significant and unavoidable**.

IMPACT TR-14 *Implementation of the Cathedral Hill Campus project MOB Access Variant would have a less than-significant impact at six study intersections that would operate at LOS E or LOS F under 2015 Modified Baseline No Project conditions and Modified Baseline plus Project conditions. (Less than Significant)*

Under the MOB Access Variant conditions, the intersection LOS at six of the 26 study intersections would operate at LOS E or LOS F under 2015 Modified Baseline No Project conditions, and would continue to operate at the same LOS under 2015 Modified Baseline plus Project conditions. The six intersections include:

- Gough/Geary (LOS F during a.m. peak hour)
- Franklin/O'Farrell (LOS F during a.m. peak hour)
- Franklin/Sutter (LOS E during p.m. peak hour)
- Franklin/Bush (LOS E during a.m. peak hour)
- 8th/Market (LOS E during a.m. peak hour, and LOS F during p.m. peak hour)
- Octavia/Market/U.S. 101 (LOS F during a.m. peak hour)

The increase in vehicle trips at these six intersections by the proposed Cathedral Hill Campus project was reviewed to determine whether the project's increase would contribute considerably to critical movements operating at LOS E or LOS F at these intersections. Based on this examination, the project's contributions at these intersections were determined to be less than significant. Because the proposed Cathedral Hill Campus project MOB Access Variant would not contribute significantly to the poor operating conditions at these intersections, the **MOB Access Variant-related traffic impact would be less than significant**.

IMPACT TR-15 *Implementation of the Cathedral Hill Campus project MOB Access Variant would have less-than-significant impacts at 18 study intersections that would operate at LOS D or better under 2015 Modified Baseline plus Project conditions. (Less than Significant)*

With implementation of the MOB Access Variant, the following 18 study intersections would continue to operate at LOS D or better during the a.m. and p.m. peak hours and, therefore, **traffic impacts at these locations would be less than significant:**

- Gough/Post
- Gough/Sutter
- Franklin/Geary
- Franklin/Post
- Franklin/Pine
- Van Ness/Fell
- Van Ness/Hayes
- Van Ness/O'Farrell
- Van Ness/Geary
- Van Ness/Post

- Van Ness/Sutter
- Van Ness/Bush
- Van Ness/Pine
- Van Ness/Broadway
- Polk/O'Farrell
- Polk/Cedar
- Polk/Post
- Polk/Sutter

IMPACT TR-16 *Implementation of the Cathedral Hill Campus parking garages with the MOB Access Variant would have a less-than-significant impact on traffic operations because inbound peak period queues would not spill back into adjacent travel lanes. (Less than Significant)*

Under the MOB Access Variant, Cedar Street between Van Ness Avenue and Polk Street would remain one-way eastbound. The MOB driveway on Geary Street would be reconfigured to allow full ingress and egress onto Geary Street.

Allowing Cedar Street to continue to operate one-way eastbound operations and allowing for egress onto Geary Street would not substantially change the number of vehicles accessing the MOB garage via either the Geary Street or Cedar Street driveway and, similar to the Cathedral Hill Campus project described in Impact TR-5, the 95th percentile queue at the two driveway accesses to the MOB garage would be accommodated. The MOB Access Variant would not affect the operations of the proposed Cathedral Hill Hospital garage or the 1375 Sutter MOB garage.

Because the 95th percentile queue at the proposed Cathedral Hill MOB garage would be accommodated, **the potential traffic impact of spillback into adjacent traffic lanes from the garage operations would be less than significant**.

IMPACT TR-17 *Implementation of the Cathedral Hill Campus project MOB Access Variant would result in a traffic hazard impact at the proposed MOB's driveway on Geary Street. (Significant and Unavoidable with Mitigation)*

As indicated above, the MOB Access Variant would reconfigure the Cathedral Hill MOB access driveway on Geary Street to permit both ingress and egress (the Cathedral Hill Campus project includes ingress-only from Geary Street). A traffic simulation model analysis was conducted for p.m. peak-hour conditions to evaluate the impact of the driveway operations on traffic and pedestrians. The simulation showed that permitting ingress and egress onto Geary Street would create traffic hazards for vehicles and pedestrians (refer to Impact TR-42 for discussion of pedestrian hazards).

The block of Geary Street adjacent to the proposed MOB, between Polk Street and Van Ness Avenue, is expected to experience increased congestion in the future, especially in the volume of vehicles turning right from Geary Street westbound onto Van Ness Avenue northbound. In addition, pedestrian volumes on Geary Street are expected to increase because of the proposed Cathedral Hill Campus project patients, visitors, and doctors, as well as growth in the Van Ness and Japantown neighborhoods. Because of the increase in vehicular and pedestrian traffic, not all right-turning vehicles would be served within the traffic signal cycle, and a queue of unserved vehicles would form in the right lane at the intersection of Geary and Van Ness. This queue is expected to stretch beyond the MOB garage entrance, and some drivers in queue may block the garage driveway. Vehicles attempting to exit the garage would have to force their way across the queue, entering the travel lanes with potentially limited visibility (particularly if there are large vehicles in the queue obstructing visibility), which would increase the likelihood of a collision. **Thus, the MOB Access Variant's impact related to traffic hazards would be considered significant.**

Mitigation Measure MM-TR-17

During peak periods of MOB garage activity (generally mid-morning to mid-afternoon), CPMC shall staff the garage exit with a traffic control attendant or provide equivalent measures to facilitate vehicular egress from the Geary Street driveway. CPMC shall incorporate signage into the garage that directs exiting drivers to use Cedar Street during peak periods of congestion on Geary Street, and shall incorporate traffic control mechanisms within the garage with the capability to close the Geary Street exit and redirect exiting vehicles intermittently to use Cedar Street (as determined by a traffic control attendant or equivalent measure). CPMC shall install and operate pedestrian warning devices, a stop sign, and a notice for drivers to yield the right-of-way to pedestrians at the Geary Street driveway. The pedestrian warning device shall have a flashing yellow light and an intermittent audible signal that will be activated when vehicles exit the garage and drive over the sidewalk.

With implementation of Mitigation Measure MM-TR-17, the project's impact related to traffic hazards would be reduced, however not to a less-than-significant level because the potential for hazardous traffic conditions would still exist. Measures that limit vehicular access onto Geary Street, such as those included as part of the proposed LRDP project (e.g., MOB garage egress onto Cedar Street only), would be required. Therefore, **the MOB Access Variant's impact related to traffic hazards would remain significant and unavoidable**.

IMPACT TR-18 *If the proposed Van Ness Avenue BRT and Geary Corridor BRT projects are implemented, the Cathedral Hill Campus project's contribution to the combined impact of the Cathedral Hill Campus and BRT projects at five of the BRT study intersections would be less than significant. (Less than Significant)*

As described above, SFMTA and SFCTA have proposed implementation of the Van Ness Avenue BRT and Geary Corridor BRT projects. These projects and alternatives are currently under environmental review, and are scheduled for completion of construction by 2014. The proposed BRT system on Van Ness Avenue would convert one travel lane in each direction into a bus-only lane dedicated for use by BRT buses. With implementation of the Van Ness Avenue BRT, the existing southbound bus stop at the approach to Geary Boulevard and the northbound bus stop at the approach to Cedar Street would be relocated to south of Geary Street. Adjacent to the project site, buses along Geary Street currently operate in a bus-only lane and implementation of the Geary Corridor BRT would not change this operation, however other improvements would be made to enhance the efficiency of the bus-only lane and passenger operations. With implementation of the Geary Corridor BRT, the existing westbound bus stop at the approach to Franklin Street would be relocated west of Franklin Street, and a curb right-turn only lane would be provided on Geary Boulevard.

While detailed information regarding BRT design and impacts on the transportation network is not currently available, both the Van Ness Avenue BRT and the Geary Corridor BRT are reasonably foreseeable projects, and therefore, a sensitivity analysis was conducted to assess the potential combined effects of the proposed Cathedral Hill Campus and BRT projects. This analysis was conducted at a limited number of intersections based on the following criteria:

- If an intersection is projected to operate at LOS E or LOS F under 2015 Modified Baseline plus Project conditions, the intersection was assumed to continue to operate at unacceptable levels regardless of the type of BRT service that is ultimately selected as the preferred alternative, although operations at intersections may worsen with implementation of BRT service, and operations at these intersections were not further assessed.
- For intersections that are projected to operate at LOS D under 2015 Modified Baseline plus Project, it was assumed that the combined effect could potentially result in LOS E or LOS F conditions and therefore, these intersections were selected for additional analysis. At these intersections, traffic volumes and roadway geometries were adjusted based on information provided by SFCTA to determine if the proposed Cathedral Hill Campus project, in combination with the BRT, would result in additional intersections operating at LOS E or LOS F. [30]
- Based on engineering judgment, the analysis also studied intersections that had the potential to be most impacted due to change in background travel patterns or reduction in intersection capacity.

When the results of the analysis indicated that an intersection would operate at LOS E or LOS F with both the Cathedral Hill Campus project and the BRT projects, the Cathedral Hill Campus project contributions to the critical movements were examined to determine whether the Cathedral Hill Campus project contributions would be considered significant. Finally, if the Cathedral Hill Campus resulted in a significant intersection impact

[30] Study intersection #26 (Octavia Boulevard/Market Street/US 101) is not located on the BRT corridors or on adjacent facilities that would be likely to experience increased traffic due to diversion. Therefore, it is not discussed further in this section.

(Impacts TR-1 and TR-2), it was assumed that it would continue to result in such an impact with implementation of the BRT.

In general, with implementation of the BRT service, intersection delay and LOS is expected to worsen along Van Ness Avenue due to the loss of the travel lanes required to exclusively accommodate the BRT service. Levels of service on nearby streets would also likely degrade, since some traffic would be expected to use parallel facilities (e.g., Gough Street, Franklin Street) instead of Van Ness Avenue.

Based on the criteria presented above, a total of four study intersections were analyzed for combined project and BRT impacts assessment (Gough/Geary, Van Ness/Fell, Van Ness/Geary, and Polk/Geary). In addition, the intersections of Van Ness/Hayes and Van Ness/Broadway were analyzed because the potential vehicle lane reductions proposed by the Van Ness Avenue BRT project could substantially affect intersections operations (these intersections are projected to operate at LOS C or better under 2015 Modified Baseline plus Project conditions).

The sensitivity analysis for the combined impact of the Cathedral Hill Campus project and the BRT projects indicated that two of the six intersections (Van Ness/Geary and Van Ness/Broadway) would operate at LOS D or better and four of the six intersections would operate at LOS E or LOS F conditions, including Gough/Geary, Van Ness/Fell, Van Ness/Hayes, and Polk/Geary. An examination of the proposed Cathedral Hill Campus project contributions to the critical movements at these four intersections indicated that the Cathedral Hill Campus project would have a less-than-significant project contribution at the intersections of Gough/Geary, Van Ness/Fell and Van Ness/Hayes**.** Therefore**, the project's traffic impact identified for the combined impact of the Cathedral Hill Campus project and the BRT projects at the five intersections of Gough/Geary, Van Ness/Fell, Van Ness/Hayes, Van Ness/Geary, and Van Ness/Broadway would be less than significant**.

IMPACT TR-19 *If the proposed Van Ness Avenue BRT and Geary Corridor BRT projects are implemented, the Cathedral Hill Campus project's contribution to the combined impact of the Cathedral Hill Campus and BRT projects would be significant at the intersection of Polk/Geary. (Significant and Unavoidable)*

Based on the sensitivity analysis conducted for future conditions with BRT and an examination of the proposed Cathedral Hill project contributions to intersections (as described above in Impact TR-18), the project contributions to the critical movements at the intersection of Polk/Geary, which would operate at LOS E under 2015 Modified Baseline plus Project with the proposed BRT during both the a.m. and p.m. peak hours, were determined to be less than significant. However, because this intersection was identified in Impact TR-2 as a significant and unavoidable impact, this impact determination would also apply to the sensitivity analysis. As discussed under Impact TR-2, no feasible mitigation measures have been identified. Therefore**, the Cathedral Hill Campus project's contribution to the traffic impact identified for the combined Cathedral Hill Campus and BRT projects at the intersection of Polk/Geary would be significant and unavoidable**.

IMPACT TR-20 *If the proposed Van Ness Avenue BRT and Geary Corridor BRT projects are implemented, the Cathedral Hill Campus project's contribution to the combined impact of the Cathedral Hill Campus and BRT projects would be significant at the intersection of Van Ness/Market. (Significant and Unavoidable)*

As determined in Impact TR-1, the Cathedral Hill Campus project would result in a significant and unavoidable impact at the intersection of Van Ness/Market under 2015 Modified Baseline plus Project conditions. As discussed under Impact TR-1, no feasible mitigation measures have been identified. Therefore, **the project's contribution to the traffic impact identified for the combined impact of the Cathedral Hill Campus and BRT projects at the intersection of Van Ness/Market would be significant and unavoidable.**

IMPACT TR-21 *For the Two-Way Post Street Variant, if the proposed Van Ness Avenue BRT and Geary Corridor BRT projects are implemented, the Cathedral Hill Campus project's contribution to the combined impact of the Cathedral Hill Campus and BRT projects at five of the BRT study intersections would be less than significant. (Less than Significant)*

For the Two-Way Post Street Variant, a similar sensitivity analysis was conducted as described for the Cathedral Hill Campus project in Impact TR-18. The sensitivity analysis for the combined impact of the Cathedral Hill Campus project Two-Way Post Street Variant and the BRT projects indicated that two of the six intersections (Van Ness/Geary and Van Ness/Broadway) would operate at LOS D or better and four of the six intersections analyzed for the sensitivity analysis would operate at LOS E or LOS F conditions, including Gough/Geary, Van Ness/Fell, Van Ness/Hayes, and Polk/Geary. An examination of the proposed Cathedral Hill Campus project contributions to the critical movements at these intersections indicated that under the Two-Way Post Street Variant, the Cathedral Hill Campus project would have less-than-significant project contributions at the intersections of Gough/Geary, Van Ness/Fell and Van Ness/Hayes**.** Therefore**, the traffic impact identified for the combined impact of the Cathedral Hill Campus project Two-Way Post Street Variant and the BRT projects at the five intersections of Gough/Geary, Van Ness/Fell, Van Ness/Hayes, Van Ness/Geary, and Van Ness/Broadway would be less than significant**.

IMPACT TR-22 *For the Two-Way Post Street Variant, if the proposed Van Ness Avenue BRT and Geary Corridor BRT projects are implemented, the Cathedral Hill Campus project's contribution to the combined impact of the Cathedral Hill Campus and BRT projects would be significant at the intersection of Polk/Geary. (Significant and Unavoidable)*

Based on the sensitivity analysis conducted for the Two-Way Post Street Variant with future conditions with BRT and an examination of the proposed Cathedral Hill Campus project contributions to intersections (as described above in Impact TR-18), the Cathedral Hill Campus project contributions to the critical movements at the intersection of Polk/Geary, which would operate at LOS E under 2015 Modified Baseline plus Project with the proposed BRT during both the a.m. and p.m. peak hours, were determined to be less than significant. However, because this intersection was identified in Impact TR-7 as a significant and unavoidable project impact, this impact determination would also apply to the sensitivity analysis. No feasible mitigation measures have been identified to reduce the project impact to less-than-significant level. Therefore**, the contribution to the traffic impact identified for the combined impact of the Cathedral Hill Campus project Two-Way Post Street Variant and the BRT projects at the intersection of Polk/Geary would be significant and unavoidable.**

IMPACT TR-23 *For the Two-Way Post Street Variant, if the proposed Van Ness Avenue BRT and Geary Corridor BRT projects are implemented, the Cathedral Hill Campus project's contribution to the combined impact of the Cathedral Hill Campus and BRT projects would be significant at the intersection of Van Ness/Market. (Significant and Unavoidable)*

As determined in Impact TR-6, the Cathedral Hill Campus project Two-Way Post Street Variant would result in a significant and unavoidable impact at the intersection of Van Ness/Market under 2015 Modified Baseline plus Project conditions. No feasible mitigation measures have been identified to reduce the project impact to less-than-significant level. Therefore, **the contribution to the traffic impact identified for the combined impact of the Cathedral Hill Campus project Two-Way Post Street Variant and the BRT projects at the intersection of Van Ness/Market would be significant and unavoidable**.

IMPACT TR-24 *For the MOB Access Variant, if the proposed Van Ness Avenue BRT and Geary Corridor BRT projects are implemented, the Cathedral Hill Campus project's contribution to the combined impact of the Cathedral Hill Campus and BRT projects at five of the BRT study intersections would be less than significant. (Less than Significant)*

For the MOB Access Variant, a similar sensitivity analysis was conducted as described for the Cathedral Hill Campus project in Impact TR-18. The sensitivity analysis for the combined impact of the Cathedral Hill Campus project MOB Access Variant and the BRT projects indicated that two of the six intersections (Van Ness/Geary and Van Ness/Broadway) would operate at LOS D or better and four of the six study intersections would operate at LOS E or LOS F conditions, including Gough/Geary, Van Ness/Fell, Van Ness/Hayes, and Polk/Geary. An examination of the proposed Cathedral Hill Campus project contributions to the critical movements at these intersections indicated that under the MOB Access Variant, the Cathedral Hill Campus project would have less-than-significant project contributions at the intersections of Gough/Geary, Van Ness/Fell and Van Ness/Hayes**.** Therefore**, the traffic impact identified for the combined impact of the Cathedral Hill Campus project MOB Access Variant and the BRT projects at the three intersections of Gough/Geary, Van Ness/Fell, Van Ness/Hayes, Van Ness/Geary, and Van Ness/Broadway would be less than significant.**

IMPACT TR-25 *For the MOB Access Variant, if the proposed Van Ness Avenue BRT and Geary Corridor BRT projects are implemented, the Cathedral Hill Campus project's contribution to the combined impact of the Cathedral Hill Campus and BRT projects would be significant at the intersection of Polk/Geary. (Significant and Unavoidable)*

Based on the sensitivity analysis conducted for the MOB Access Variant with future conditions with BRT and an examination of the proposed Cathedral Hill project contributions to intersections (as described in Impact TR-18), the project contributions to the critical movements at the intersection of Polk/Geary, which would operate at LOS E under 2015 Modified Baseline plus Project with the proposed BRT during both the a.m. and p.m. peak hours, were determined to be less than significant. However, because this intersection was identified in Impact TR-13 as a significant and unavoidable impact, this impact determination would also apply to the sensitivity analysis. No feasible mitigation measures have been identified to reduce the project impact to less-than-significant level. Therefore**, the contribution to the traffic impact identified for the combined impact of the Cathedral Hill Campus project MOB Access Variant and the BRT projects at the intersection of Polk/Geary would be significant and unavoidable**.

IMPACT TR-26 *For the MOB Access Variant, if the proposed Van Ness Avenue BRT and Geary Corridor BRT projects are implemented, the Cathedral Hill Campus project's contribution to the combined impact of the Cathedral Hill Campus and BRT projects would be significant at the intersection of Van Ness/Market. (Significant and Unavoidable)*

As determined in Impact TR-12, the Cathedral Hill Campus project MOB Access Variant would result in a significant and unavoidable impact at the intersection of Van Ness/Market under 2015 Modified Baseline plus Project conditions. No feasible mitigation measures have been identified to reduce the project impact to less-than-significant level. Therefore, **the contribution to the traffic impact identified for the combined impact of the**

Cathedral Hill Campus project MOB Access Variant and the BRT projects at the intersection of Van Ness/Market would be significant and unavoidable.

Overview of Project Transit Impacts at the proposed Cathedral Hill Campus

The proposed Cathedral Hill Campus project would generate new transit riders. Muni would have sufficient capacity to accommodate all the project-generated riders while maintaining its capacity utilization standard of 85 percent or less. The Two-Way Post Street Variant and the MOB Access Variant would not change the number of transit trips generated by the proposed project and, therefore, would result in similar less-than-significant capacity utilization impacts.

The proposed Cathedral Hill Campus project would add vehicles to the street network and riders to the Muni lines. The increased congestion and ridership would cause operational delays to Muni lines 49-Van Ness-Mission (a.m. and p.m. peak hours), 38/38L-Geary (a.m. and p.m. peak hours), and 19-Polk (p.m. peak hour), requiring additional vehicles to maintain proposed levels of service. To mitigate the impact on transit, CPMC would financially compensate SFMTA for the cost of providing the additional services. Although the mitigation measure would reduce the impacts to a less-than-significant level, the ability of SFMTA to provide additional service for the project is uncertain. Therefore, the impact on transit would remain significant and unavoidable. The Two-Way Post Street Variant and the MOB Access Variant would result in the same transit delay impacts as the proposed project except for the 19-Polk bus line. Under the MOB Access Variant, the transit delay impact on the 19-Polk would be less than significant. The same mitigation measures identified for the proposed project would apply to both variants.

The CPMC LRDP project was determined to have a significant impact on transit operations if it would result in an increase in transit vehicle travel times such that additional vehicles would be required to maintain headways. The need for additional transit vehicles was determined by comparing the project's travel time increase on a particular route to the headway anticipated under the TEP, which is reasonably expected to be implemented by Modified Baseline 2015. An impact was identified if the travel time increases were greater than half of the proposed TEP headway or if the number of required vehicles estimated using SFMTA's cost/scheduling model increased by one or more vehicles with the addition of project travel demand. However, even if the TEP is not implemented, the CPMC LRDP would result in similar less-than-significant capacity utilization impacts and similar significant transit delay impacts as identified for the project, the Two-Way Post Street and MOB Access variants.

With implementation of the Van Ness BRT, the 47-Van Ness and the 49-Van Ness-Mission would operate in bus only lanes. Therefore, any increase in vehicular caused delay would be expected to have minimal impact on transit travel times. Passenger boarding delay associated with the proposed Cathedral Hill Campus project would be reduced with the Van Ness BRT.[31] Accordingly, transit impact on the 49-Van Ness-Mission would be reduced with implementation of the Van Ness BRT. Impacts on all other transit lines serving the Cathedral Hill Campus area would remain the same irrespective of whether the Van Ness BRT is implemented.

IMPACT TR-27 *Implementation of the Cathedral Hill Campus project would not cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity. (Less than Significant)*

The Cathedral Hill Campus project would generate 586 new transit trips during the a.m. peak hour and 551 transit trips during the p.m. peak hour, as shown in Table 4.5-11 (page 4.5-77). Transit trips to and from the Cathedral Hill Campus would utilize the nearby Muni bus lines, and may include transfers to other Muni bus and light rail lines, or other regional transit providers. Table 4.5-21, "Muni Corridor Analysis—Cathedral Hill, St. Luke's, and California Campuses" (page 4.5-119), summarizes the corridor capacity utilization analysis for the 14 Muni routes serving the Cathedral Hill Campus vicinity. The additional transit demand could be accommodated during the a.m. and p.m. peak hours, and all four corridors would continue to operate at less than Muni's 85 percent capacity utilization standards. Therefore, **the proposed Cathedral Hill Campus project's impact on transit capacity at the study area corridors would be less than significant. Impacts of the Two-Way Post Street Variant and the MOB Access Variant on capacity utilization also would be less than significant as these two variants would not change the number of transit riders generated by the proposed Cathedral Hill Campus project.**

IMPACT TR-28 *Implementation of the Cathedral Hill Campus project's shuttle operation would be accommodated within the proposed shuttle loading zone and would not impact adjacent transit service. (Less than Significant)*

The CPMC shuttle to the Cathedral Hill Campus would use the proposed 100-foot long shuttle loading zone on the south side of Post Street at the approach to Van Ness Avenue. The shuttle loading area would be recessed into the sidewalk and would accommodate up to four CPMC shuttles at any one time. Therefore, it is not anticipated that shuttle stop activities would conflict with the Muni operations within the eastbound bus-only lane on Post Street. **Impacts of CPMC's shuttle service on nearby transit lines would be less than significant. Shuttle impacts of the two variants would be the same as identified above, because the variants would not change the configuration of the shuttle loading zone proposed under the Cathedral Hill Campus project.**

[31] Passenger dwell time for the Van Ness BRT (about 0.5 seconds) is less than for other buses.

Table 4.5-21
Muni Corridor Analysis—Cathedral Hill, St. Luke's, and California Campuses

	Existing		Modified Baseline 2015 No Project		Modified Baseline 2015 Project		Cumulative 2030 No Project		Cumulative 2030 Project	
	Ridership	Capacity Utilization	Ridership	Capacity Utilization	Ridership	Capacity Utilization	Ridership	Capacity Utilization	Ridership	Capacity Utilization
Cathedral Hill—A.M. Peak Hour										
Northbound	1,377	63%	1,415	64%	1,569	71%	1,458	66%	1,612	73%
Southbound	1,242	57%	1,373	62%	1,445	66%	1,521	69%	1,593	72%
Eastbound	3,687	64%	3,722	65%	3,926	69%	3,761	66%	3,965	69%
Westbound	2,111	45%	2,510	51%	2,559	51%	2,964	60%	3,013	61%
Cathedral Hill—P.M. Peak Hour										
Northbound	1,307	60%	1,397	56%	1,464	58%	1,702	68%	1,769	70%
Southbound	1,176	54%	1,198	48%	1,366	54%	1,267	50%	1,435	57%
Eastbound	2,408	52%	2,599	52%	2,645	53%	3,345	65%	3,288	66%
Westbound	3,926	68%	3,975	69%	4,192	73%	4,249	72%	4,360	76%
St. Luke's Campus—P.M. Peak Hour										
Northbound	1,553	46%	1,690	44%	1,717	45%	2,054	54%	2,081	55%
Southbound	2,157	56%	2,163	57%	2,186	57%	2,181	57%	2,204	58%
Eastbound	442	70%	460	73%	471	75%	500	79%	511	81%
Westbound	318	50%	319	51%	325	52%	321	51%	327	52%
California Campus—P.M. Peak Hour										
Northbound	382	38%	387	32%	387	32%	393	32%	393	32%
Southbound	1,421	74%	1,421	61%	1,452	62%	1,421	61%	1,452	62%
Eastbound	3,122	34%	3,543	35%	3,609	36%	3,839	38%	3,905	39%
Westbound	7,380	81%	7,750	77%	7,765	77%	8,073	80%	8,088	80%

Notes: Capacity utilization calculations reflect capacity changes associated with the TEP project. Service changes resulting in capacity increases are proposed for the 5-Fulton, 12-Folsom-Pacific, 19-Polk, 21-Hayes, 22-Fillmore, 24-Divisadero, 27-Bryant, 31-Balboa, 38L-Geary Limited, 44-O'Shaughnessy, 47-Van Ness, 49-Van Ness-Mission, F-Market & Wharves, J-Church, L-Taraval, and N-Judah. Service changes resulting in decreases in capacity are proposed to occur on the 1BX-California Express, 2-Clement, 16AX/BX-Noriega Expresses, 38BX-Geary Express, 48-Quintara-24th Street, and M-Ocean View. Source: Data Compiled by Fehr & Peers in 2010.

IMPACT TR-29 *Implementation of the Cathedral Hill Campus project would increase congestion and ridership along Van Ness Avenue, which would increase travel times and impact operations of the 49-Van Ness-Mission bus route. (Significant and Unavoidable with Mitigation)*

The Cathedral Hill Campus project was determined to have a significant impact on transit operations if it would result in an increase in transit vehicle travel times such that additional vehicles would be required to maintain the proposed headways. The need for additional transit vehicles was determined by comparing the project's travel time increases on a particular route to the proposed headway. An impact was identified if the travel time increases were greater than half of the proposed headway, or if the number of required vehicles estimated using SFMTA's cost/scheduling model increased by one or more vehicles with the addition of project travel demand. Table 4.5-22, "Transit Corridor Delay Analysis—Cathedral Hill Campus" (page 4.5-121), presents a comparison of the travel time increases to the proposed headways for the transit routes in the immediate vicinity of the Cathedral Hill Campus. The results of the analysis using SFMTA's cost/scheduling model, in terms of additional buses needed to serve the project, are summarized in Table 4.5-23, "Additional Muni Transit Vehicle Requirements—A.M. and P.M. Peak Hours" (page 4.5-122).

Under 2015 Modified Baseline plus Project conditions, the proposed Cathedral Hill Campus project would result in an increase in travel time on the northbound 49-Van Ness-Mission by about 4 minutes during the a.m. peak hour. This increase would be more than half of the proposed headway of 7½ minutes. In addition, as indicated in Table 4.5-23 (page 4.5-122), the results of SFMTA's cost/scheduling model indicated that, as a result of the proposed project, an additional bus would be needed during the a.m. and p.m. peak hours. Therefore, **project-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on the operation of the 49-Van Ness-Mission bus route during the a.m. and p.m. peak hours would result in a significant transit operational impact.**

To determine the appropriate mitigation for this impact, SFMTA considers the additional service level delay occurring as a direct result of the proposed project's increase in traffic levels and increase in transit demand. The SFMTA determines whether the additional delay can be absorbed by service on that line, and if not, what appropriate fee would be required to mitigate the proposed project's impact to transit, with the goal of maintaining proposed levels of service. The fee accounts for operating costs of new buses, including labor and maintenance, over an approximately 45-year period.

Table 4.5-22
Transit Corridor Delay Analysis—Cathedral Hill Campus

Route	Headway (min:sec)[1]	Cathedral Hill Campus Project Increases in Travel Time between No Project and Plus Project Conditions (minutes:seconds)			
		2015 Modified Baseline		2030 Cumulative	
		Northbound/ Eastbound	Southbound/ Westbound	Northbound/ Eastbound	Southbound/ Westbound
2-Clement					
a.m.	12:00	0:20	0:15	0:20	0:15
p.m.	12:00	0:16	0:21	0:16	0:21
3-Jackson					
a.m.	10:00	0:20	0:15	0:20	0:15
p.m.	10:00	0:16	0:21	0:16	0:21
19-Polk					
a.m.	10:00	0:31	2:05	0:31	1:53
p.m.	10:00	0:28	**8:22**[2]	0:28	**8:18**
38-Geary					
a.m.	7:30	0:51	0:27	0:51	0:27
p.m.	6:00	0:27	1:34	0:27	0:54
38L-Geary Limited[3]					
a.m.	5:00	1:22	0:16	1:22	0:16
p.m.	5:00	0:12	2:07	0:12	1:28
47-Van Ness[3]					
a.m.	7:30	1:34	1:29	1:58	1:38
p.m.	7:30	2:20	0:55	2:37	0:49
49-Van Ness-Mission					
a.m.	7:30	**3:56**	0:40	**4:21**	0:49
p.m.	7:30	1:14	3:39	1:31	3:32

Notes:

[1] TEP proposed headway. Does not account for BRT service on Van Ness Avenue.

[2] Location where additional delay exceeds half the proposed headway is highlighted in **bold.**

[3] Although the proposed project would not result in a delay that would amount to half of a proposed headway on the 3-Jackon, 38/38L Geary, and 47-Van Ness, as shown in Table 4.5-23, the delay would be large enough to necessitate the provision of additional buses to maintain the proposed headways.

Source: Data compiled by Fehr & Peers in 2010

Table 4.5-23
Additional Muni Transit Vehicle Requirements—
2015 Modified Baseline—Weekday A.M. and P.M. Peak Hours

Route	Project		Two-Way Post Street Variant		MOB Access Variant	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
2-Clement	0	0	0	0	0	0
3-Jackson	0	0	0	0	0	0
19-Polk	0	0	0	0	0	0
38/38L-Geary	**1**	**2**	**1**	**2**	**1**	**2**
47-Van Ness	0	0	0	0	0	0
49-Van Ness-Mission	**1**	**1**	**1**	**1**	**1**	**1**
2030 Cumulative Conditions—Weekday A.M. and P.M. Peak Hours						
Route	Project		Two-Way Post Street Variant		MOB Access Variant	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
2-Clement	0	0	0	0	0	0
3-Jackson	0	**1**	0	**1**	0	**1**
19-Polk	0	**1**	0	**1**	0	**1**
38/38L-Geary	**1**	**2**	**1**	**2**	**1**	**2**
47-Van Ness	0	**1**	0	**1**	0	**1**
49-Van Ness-Mission	**1**	**1**	**1**	**1**	**1**	**1**

Source: Data provided by San Francisco Municipal Transportation Agency in 2010

Mitigation Measure MM-TR-29

CPMC shall ensure that the transit delay impact related to the Cathedral Hill Campus project on the 49-Van Ness-Mission is reduced to a less-than-significant level by financially compensating the SFMTA for the cost of providing the service needed to accommodate the project at proposed levels of service. The financial contribution shall be calculated and applied in a manner that is consistent with the SFMTA cost/scheduling model. The amount and schedule for payment and commitment to application of service needs shall be set forth in a Transit Mitigation Agreement between CPMC and SFMTA.

The payment of the fee identified in Mitigation Measure MM-TR-29 would reduce the project's impact on the operation of the 49-Van Ness-Mission bus route to a level of insignificance. However, because the ability of SFMTA to provide the additional service on this line needed to accommodate this project is uncertain, the feasibility of the mitigation measure is unknown. Therefore, **the proposed project's impacts on the operation of the 49-Van Ness-Mission bus route would remain significant and unavoidable**.

IMPACT TR-30 *Implementation of the Cathedral Hill Campus project would increase congestion and ridership along Geary Street, which would increase travel times and impact operations of the 38/38L-Geary bus routes. (Significant and Unavoidable with Mitigation)*

As indicated in Table 4.5-23 (page 4.5-122), assessment conducted by SFMTA of the Cathedral Hill Campus project impact on the 38/38L-Geary using the SFMTA's cost/scheduling model identified that an additional bus would be required to maintain peak period headways during the a.m. peak hour and two additional buses during the p.m. peak hour. Therefore, **project-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 38/38L-Geary during the a.m. and p.m. peak hours would result in a significant transit operational impact.**

Mitigation Measure MM-TR-30

CPMC shall ensure that the transit delay impact related to the Cathedral Hill Campus project on the 38/38L-Geary is reduced to a less-than-significant level by financially compensating the SFMTA for the cost of providing the service needed to accommodate the project at proposed levels of service. The financial contribution shall be calculated and applied in a manner that is consistent with the SFMTA cost/scheduling model. The amount and schedule for payment and commitment to application of service needs shall be set forth in a Transit Mitigation Agreement between CPMC and SFMTA.

The payment of the fee identified in Mitigation Measure MM-TR-30 would reduce the project's impact on the operation of the 38/38L-Geary bus routes to a level of insignificance. However, because the ability of SFMTA to provide the additional service on this line needed to accommodate this project is uncertain, the feasibility of the mitigation measure is unknown. Therefore, **the proposed project's impacts on the operation of the 38/38L-Geary bus routes would remain significant and unavoidable.**

IMPACT TR-31 *Implementation of the Cathedral Hill Campus project would increase congestion and ridership along Polk Street, which would increase travel times and impact operations of the 19-Polk bus route. (Significant and Unavoidable with Mitigation)*

As indicated in Table 4.5-22 (page 4.5-121), under 2015 Modified Baseline plus Project conditions, the proposed Cathedral Hill Campus project would result in increase in travel time on the southbound 19-Polk bus route by about 8 minutes during the p.m. peak hour. This increase would be more than half of the proposed headway of 10 minutes. A new bus would be required to maintain peak period headways during the P.M. peak hour; therefore, **project-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 19-Polk bus route during the p.m. peak hour would result in a significant transit operational impact.**

Mitigation Measure MM-TR-31

CPMC shall ensure that the transit delay impact related to the Cathedral Hill Campus project on the 19-Polk is reduced to a less-than-significant level by financially compensating the SFMTA for the cost of providing the service needed to accommodate the project at proposed levels of service. The financial contribution shall be calculated and applied in a manner that is consistent with the SFMTA cost/scheduling model. The amount and schedule for payment and commitment to application of service needs shall be set forth in a Transit Mitigation Agreement between CPMC and SFMTA.

The payment of the fee identified in Mitigation Measure MM-TR-31 would reduce the project's impact on the operation of the 19-Polk bus route to a level of insignificance. However, because the ability of SFMTA to provide the additional service on this line needed to accommodate this project is uncertain, the feasibility of the mitigation measure is unknown. Therefore, **the proposed project's impacts on the operation of the 19-Polk bus route would remain significant and unavoidable**.

IMPACT TR-32

Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would increase congestion and ridership along Van Ness Avenue, which would increase travel times and impact operations of the 49-Van Ness-Mission bus route. (Significant and Unavoidable with Mitigation)

The Two-Way Post Street Variant would convert Post Street between Gough Street and Van Ness Avenue from a one-way eastbound operation to a two-way operation. The hospital driveway on Post Street would be reconfigured to allow full ingress and egress onto Post Street from both the eastbound and westbound directions. Table 4.5-24, "Transit Corridor Delay Analysis—Cathedral Hill Campus Two-Way Post Street Variant and MOB Access Variant Conditions" (page 4.5-125), presents a comparison of the travel time increases to the proposed headways for the transit routes in the immediate vicinity of the Cathedral Hill Campus for conditions with the Two-Way Post Street Variant. Table 4.5-23, "Additional Muni Transit Vehicle Requirements—2015 Modified Baseline and 2030 Cumulative Conditions—Weekday A.M. and P.M. Peak Hours" (page 4.5-122), presents the results of SFMTA's cost/scheduling model analysis that was conducted to identify the need for additional buses.

Under 2015 Modified Baseline plus Two-Way Post Street Variant conditions, the proposed Cathedral Hill Campus project would result in an increase in travel time on the northbound 49-Van Ness-Mission bus route by about 4 minutes during the a.m. peak hour. This increase would be more than half of the proposed headway of 7½ minutes. In addition, as indicated in Table 4.5-23 (page 4.5-122), the results of SFMTA's cost/scheduling model indicated that an additional bus would be needed during the a.m. and p.m. peak hours. Therefore, the **Two-Way Post Street Variant-related transit delays resulting from congestion on study area roadways and passenger**

Table 4.5-24
Transit Corridor Delay Analysis—Cathedral Hill Campus
Two-Way Post Street Variant and MOB Access Variant Conditions

Route	Headway (min:sec)[1]	Two-Way Post Street Variant Increases in Travel Time between No Project and Plus Project Conditions (minutes:seconds)				MOB Access Variant Increases in Travel Time between No Project and Plus Project Conditions (minutes:seconds)			
		2015 Modified Baseline		2030 Cumulative		2015 Modified Baseline		2030 Cumulative	
		Northbound/ Eastbound	Southbound/ Westbound	Northbound/ Eastbound	Southbound/ Westbound	Northbound/ Eastbound	Southbound/ Westbound	Northbound/ Eastbound	Southbound/ Westbound
2-Clement									
a.m.	12:00	0:20	0:15	0:20	0:15	0:20	0:15	0:20	0:15
p.m.	12:00	0:16	0:21	0:16	0:21	0:16	0:21	0:16	0:21
3-Jackson									
a.m.	10:00	0:20	0:15	0:20	0:15	0:20	0:15	0:20	0:15
p.m.	10:00	0:16	0:21	0:16	0:21	0:16	0:21	0:16	0:21
19-Polk									
a.m.	10:00	0:31	2:05	0:31	2:05	0:31	2:00	0:31	1:44
p.m.	10:00	0:28	**8:22**[2]	0:28	**8:22**	0:27	2:58	0:28	3:47
38-Geary									
a.m.	7:30	0:51	0:27	0:51	0:27	0:51	0:27	0:51	0:27
p.m.	6:00	0:27	1:34	0:27	0:54	0:27	1:34	0:27	0:54
38L-Geary Limited									
a.m.	5:00	1:22	0:16	1:22	0:16	1:22	0:16	1:22	0:16
p.m.	5:00	0:12	2:08	0:12	1:28	0:12	2:07	0:12	1:28
47-Van Ness									
a.m.	7:30	1:30	1:28	1:30	1:28	1:34	1:29	1:58	1:39
p.m.	7:30	2:13	0:49	2:13	0:49	2:20	0:55	2:37	0:49
49-Van Ness-Mission									
a.m.	7:30	**3:53**	0:38	**3:53**	0:38	**3:56**	0:40	**4:21**	0:49
p.m.	7:30	1:07	3:33	1:07	3:33	1:14	3:40	1:31	3:33

Notes:
[1] TEP proposed headway. Does not account for Bus Rapid Transit service on Van Ness Avenue.
[2] Location where additional delay exceeds half the proposed headway is highlighted in **bold.**
Source: Data compiled by Fehr & Peers in 2010

loading delays associated with increased ridership on operation of the 49-Van Ness-Mission bus route during the a.m. and p.m. peak hours would result in a significant transit operational impact.

Mitigation Measure MM-TR-29 would reduce the transit delay impact related to the Cathedral Hill Campus project Two-Way Post Street Variant on the 49-Van Ness-Mission bus route to a less-than-significant level. However, because the ability of SFMTA to provide the additional service on this line needed to accommodate this project is uncertain, the feasibility of the mitigation measure is unknown. Therefore, **the proposed project's Two-Way Post Street Variant-related impact on the operation of the 49-Van Ness-Mission bus route would remain significant and unavoidable**.

IMPACT TR-33 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would increase congestion and ridership along Geary Street, which would increase travel times and impact operations of the 38/38L-Geary bus routes. (Significant and Unavoidable with Mitigation)*

As indicated in Table 4.5-23 (page 4.5-122), assessment conducted by SFMTA of the Cathedral Hill Campus project Two-Way Post Street Variant impact on the 38/38L-Geary using the SFMTA's cost/scheduling model identified that an additional bus would be required to maintain peak period headways during the a.m. peak hour, and two additional buses during the p.m. peak hour. Therefore, **project-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 38/38L-Geary during the a.m. and p.m. peak hours would result in a significant transit operational impact**.

Mitigation Measure MM-TR-30 would reduce the transit delay impacts related to the Cathedral Hill Campus project Two-Way Post Street Variant on the 38/38L-Geary to a less-than-significant level. However, because the ability of SFMTA to provide the additional service on this line needed to accommodate this project is uncertain, the feasibility of the mitigation measure is unknown. Therefore, **the Two-Way Post Street Variant-related impact on the operation of the 38/38L-Geary would remain significant and unavoidable.**

IMPACT TR-34 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would increase congestion and ridership along Polk Street, which would increase travel times and impact operations of the 19-Polk bus route. (Significant and Unavoidable with Mitigation)*

As indicated in Table 4.5-24 (page 4.5-125), under 2015 Modified Baseline plus Two-Way Post Street Variant conditions, the proposed Cathedral Hill Campus project would result in an increase in travel time on the southbound 19-Polk bus route by about 8 minutes during the p.m. peak hour. This increase would be more than half of the proposed headway of 10 minutes. A new bus would be required to maintain peak period headways during the P.M. peak hour. Therefore, **project-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 19-Polk bus route during the p.m. peak hour would result in a significant transit operational impact.**

Mitigation Measure MM-TR-31 would reduce the transit delay impacts related to the Cathedral Hill Campus project Two-Way Post Street Variant on the 19-Polk to a less-than-significant level. However, because the ability of SFMTA to provide the additional service on this line needed to accommodate this project is uncertain, the feasibility of the mitigation measure is unknown. Therefore, **the Two-Way Post Street Variant-related impact on the operation of the 19-Polk bus route would remain significant and unavoidable.**

IMPACT TR-35 *Implementation of the Cathedral Hill Campus project MOB Access Variant would increase congestion and ridership along Van Ness Avenue, which would increase travel times and impact operations of the 49-Van Ness-Mission bus route. (Significant and Unavoidable with Mitigation)*

Under the MOB Access Variant, Cedar Street between Van Ness Avenue and Polk Street would remain one-way eastbound as under existing conditions. In addition, the MOB driveway on Geary Street would be reconfigured to allow full ingress and egress onto Geary Street.

Table 4.5-24 (page 4.5-125) presents a comparison of the travel time increases to the proposed headways for the transit routes in the immediate vicinity of the Cathedral Hill Campus for conditions with the MOB Access Variant. Under 2015 Modified Baseline plus MOB Variant conditions, the proposed Cathedral Hill Campus project MOB Access Variant would result in an increase in travel time on the northbound 49-Van Ness-Mission bus route by about 4 minutes during the a.m. peak hour. This increase would be more than half of the proposed headway of 7½ minutes. In addition, as indicated in Table 4.5-23 (page 4.5-122), the results of SFMTA's cost/scheduling model indicated that an additional bus would be needed during the a.m. and p.m. peak hours. Therefore, **the MOB Access Variant-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 49-Van Ness-Mission bus route during the a.m. and p.m. peak hours would result in a significant transit operational impact**.

Mitigation Measure MM-TR-29 would reduce the transit delay impacts related to the Cathedral Hill Campus project MOB Access Variant on the 49-Van Ness-Mission to a less-than-significant level. However, because the ability of SFMTA to provide the additional service on this line needed to accommodate this project is uncertain, the feasibility of the mitigation measure is unknown. Therefore, **the MOB Access Variant-related impact on the operation of the 49-Van Ness-Mission bus route would remain significant and unavoidable**.

IMPACT TR-36 *Implementation of the Cathedral Hill Campus project MOB Access Variant would increase congestion and ridership along Geary Street, which would increase travel times and impact operations of the 38/38L-Geary bus routes. (Significant and Unavoidable with Mitigation)*

Assessment conducted by SFMTA of the Cathedral Hill Campus project MOB Access Variant impacts on the 38/38L-Geary using the SFMTA's cost/scheduling model indicated that an additional bus would be required to maintain a.m. peak hour and two buses during the p.m. peak hour headways. Therefore, **the project's impact on project-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 38/38L-Geary during the a.m. and p.m. peak hours would result in a significant transit operational impact**.

Mitigation Measure MM-TR-30 would reduce the transit delay impacts related to the Cathedral Hill Campus project MOB Access Variant on the 38/38L-Geary to a less-than-significant level. However, because the ability of SFMTA to provide the additional service on this line needed to accommodate this project is uncertain, the feasibility of the mitigation measure is unknown. Therefore, **the MOB Access Variant-related transit impact on the operation of the 38/38L-Geary would remain significant and unavoidable**.

IMPACT TR-37 *Implementation of the Cathedral Hill Campus project would not create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the project site and adjoining areas. (Less than Significant)*

The San Francisco Planning Code (Planning Code) requires that the proposed Cathedral Hill Campus project provide bicycle parking as well as showers and locker facilities. It is anticipated that the proposed Cathedral Hill project would provide 150 bicycle parking spaces at the hospital and 62 spaces at the MOB, which would exceed the Planning Code requirements and result in an increase over existing conditions in the number of bicycle parking spaces.

As part of the San Francisco Bicycle Plan, the City plans to construct a new contra-flow bicycle lane along Polk Street between Market Street and Grove Street. This new bicycle lane is expected to improve northbound bicycle circulation by connecting the existing bicycle lanes on Market Street and Polk Street along a one-way southbound segment of Polk Street. The Cathedral Hill Campus project would not interfere with implementation of the elements of the Bicycle Plan on Polk Street.

The new Cathedral Hill MOB would have a parking garage exit onto Cedar Street between Van Ness Avenue and Polk Street, which could increase conflicts between vehicles exiting the MOB parking garage and accessing Polk Street, and bicyclists traveling southbound on Polk Street. The project would include the removal of one on-street parking space on the west side of Polk Street immediately north of Cedar Street and construction of a curb extension (bulbout) at this location to ensure visibility for drivers and bicyclists at the intersection of Polk/Cedar. This project feature would ensure that potential vehicular-bicycle conflicts at this location would be minimized.

A portion of the 54 a.m. peak-hour and 49 p.m. peak-hour "other" trips identified in Table 4.5-11 (page 4.5-77) would be expected to be by bicycle. Although the Cathedral Hill Campus project would result in an increase in the number of vehicles in the vicinity of the project site, these new trips would not affect bicycle travel in the area, and therefore, **the project's impact on bicyclists would be less than significant**.

IMPACT TR-38 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would not create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the project site and adjoining areas. (Less than Significant)*

Under the Two-Way Post Street Variant, bicycle conditions would be the same as under the proposed LRDP described in Impact TR-37. As described in the impact discussion above, although the proposed Cathedral Hill Campus project would result in an increase in the number of vehicles in the vicinity of the project site, these new trips would not affect bicycle travel in the area and, therefore, **the Two-Way Post Street Variant's impact on bicyclists would be less than significant**.

IMPACT TR-39 *Implementation of the Cathedral Hill Campus project MOB Access Variant would not create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the project site and adjoining areas. (Less than Significant)*

Under the MOB Access Variant, bicycle conditions would be similar to the proposed LRDP project described in Impact TR-37, with the exception of conditions on Polk Street between Cedar Street and Geary Street. The proposed Cathedral Hill MOB would have a parking garage exit onto Cedar Street between Van Ness Avenue and Polk Street and, under the MOB Access Variant, an additional exit would be provided onto Geary Street. Providing two exits from the MOB garage would reduce the number of vehicles exiting via Cedar Street and accessing Polk Street, and would minimize the increased potential for conflicts between vehicles and bicyclists at the intersection of Cedar/Polk. As under the proposed LRDP, the MOB Access Variant would include the removal of one on-street parking space on the west side of Polk Street immediately north of Cedar Street and construction of a curb extension (bulbout) at this location to ensure visibility for drivers and bicyclists at the intersection of Polk/Cedar. This project feature would ensure that potential vehicular-bicycle conflicts at this location would be minimized. Thus, although the MOB Access Variant would result in an increase in the number of vehicles in the vicinity of the project site, these new trips would not affect bicycle travel in the area and, therefore, **the MOB Access Variant's impact on bicyclists would be less than significant**.

IMPACT TR-40 *Implementation of the Cathedral Hill Campus project would not result in substantial overcrowding on public sidewalks, create hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the project site or adjoining areas. (Less than Significant)*

Figure 4.5-20, "Pedestrian Circulation at the Cathedral Hill Campus" (page 4.5-104), illustrates the pedestrian entrances to the proposed Cathedral Hill Hospital and MOB, and the proposed improvements to the sidewalks network. The proposed Cathedral Hill Hospital would have a primary pedestrian entrance on Van Ness Avenue north of Geary Street. The proposed Cathedral Hill MOB would have a primary entrance on Van Ness Avenue, north of Geary Street, and a secondary entrance on Cedar Street, where the proposed passenger drop-off and loading zone would be located. At the 1375 Sutter MOB, pedestrian entrances would remain on Franklin Street and Sutter Street.

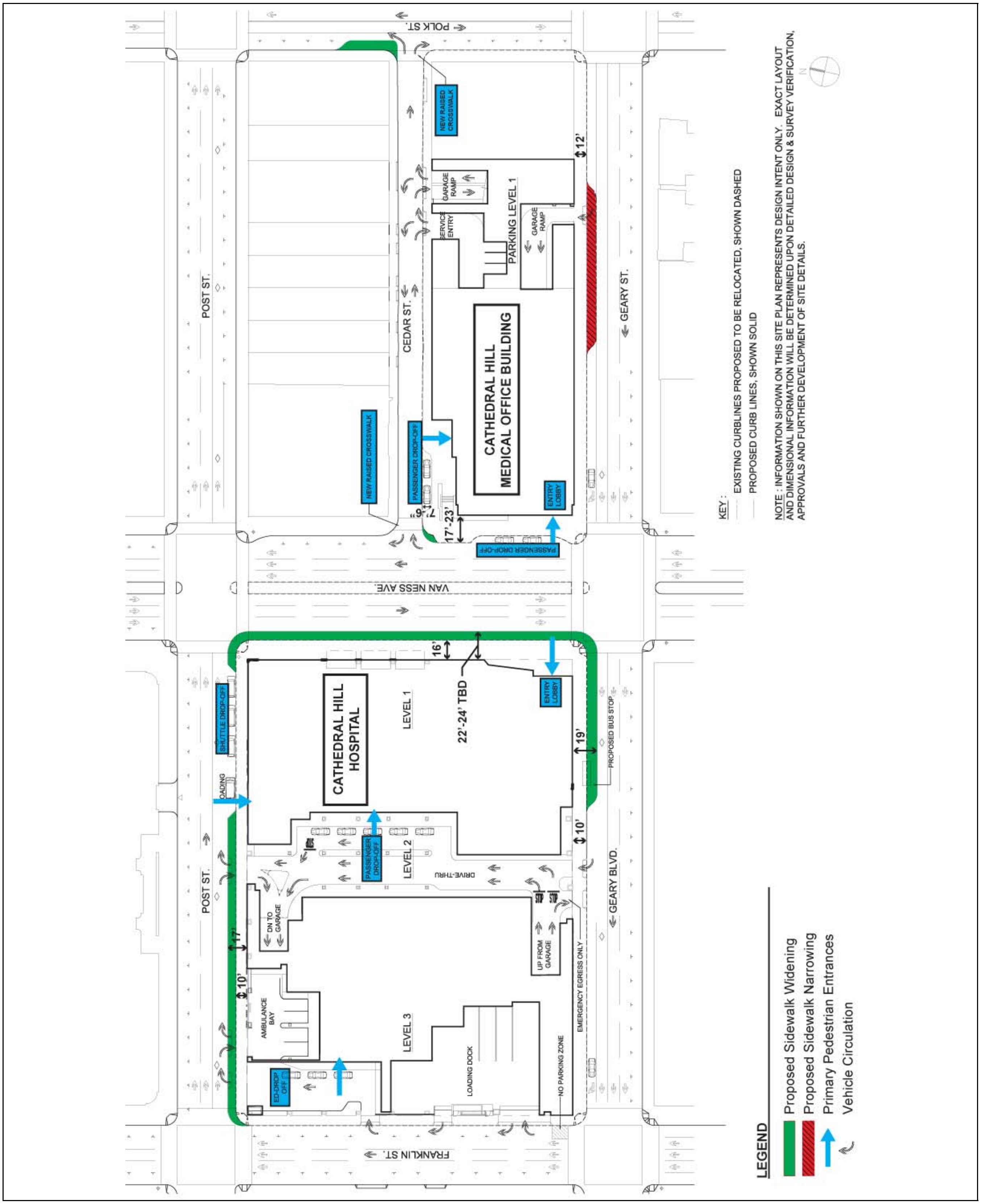
Existing sidewalks along Van Ness Avenue at the entrances to the proposed Cathedral Hill Hospital and Cathedral Hill MOB are currently approximately 16 feet wide, while sidewalks along Geary Street are approximately 10 to 12 feet wide. The Cathedral Hill Campus project would widen sidewalks adjacent to the project site along Van Ness Avenue, Geary Street, and Post Street.

The following sidewalks are proposed to be widened (see Figure 4.5-20, page 4.5-131):

- Along Van Ness Avenue, sidewalks would be widened into the adjacent parking lane. On the west side of Van Ness Avenue sidewalks would be widened from 16 feet to between 22 feet and 24 feet in width.

- Along Geary Street between Van Ness Avenue and Franklin Street, sidewalks would be widened into the adjacent parking lane to 19 feet in width for approximately 130 feet west of the Geary and Van Ness intersection. This would accommodate the proposed bus stop.

- Along Geary Street between Van Ness Avenue and Polk Street, sidewalks would be widened into the parking lane to 12 feet because the existing midblock bus stop would be removed and the sidewalk on this portion of Geary Street would be a uniform 12 feet in width.



Source: Data compiled by Fehr & Peers in 2010

Pedestrian Circulation at the Cathedral Hill Campus **Figure 4.5-20**

- Sidewalk widening along Post Street between Franklin Street and Van Ness Avenue would be widened into the adjacent parking lane, and would be widened from 10 feet to 17 feet in width.

In addition to the sidewalk widening, the Cathedral Hill Campus project would include crosswalk improvements at the intersection of Cedar Street with Van Ness Avenue and with Polk Street. At these locations, a raised crosswalk, creating a level street crossing, would be provided to facilitate pedestrian crossings, increase driver visibility of pedestrians, and reduce vehicle speeds across the crosswalk.

The Cathedral Hill Campus project would result in an increase in pedestrian activity in the vicinity of the campus, including walk trips to and from the new uses, plus walk trips to and from Muni bus stops. In addition, there would be pedestrian activity associated with trips between buildings on the campus. During the a.m. peak hour, the project would add about 694 new pedestrian trips (an increase of 108 walk trips, and 586 trips that account for walk trips to and from the Muni transit stops) to the surrounding streets, while during the p.m. peak hour, the project would add about 660 new pedestrian trips (an increase of 107 walk trips and 553 walk trips to transit). In addition to these walk and transit trips to and from the project site, the Cathedral Hill Campus project would generate trips between buildings on the campus, including about 125 intracampus pedestrian trips during the a.m. peak hour, and 159 intracampus pedestrian trips during the p.m. peak hour.

The new pedestrian trips generated by the Cathedral Hill Campus project could be accommodated on nearby sidewalks without significantly affecting pedestrian conditions. As indicated above, sidewalks in the project vicinity are 12 to 15 feet in width, and would be widened as part of the Cathedral Hill Campus project. Current peak period pedestrian volumes are low to moderate (50 to 200 pedestrians per hour) and pedestrian flows operate at acceptable levels of service.

Intracampus trips between the proposed Cathedral Hill Hospital and Cathedral Hill MOB would be able to use the proposed tunnel under Van Ness Avenue as well as surface streets pedestrian crossings, most likely at the intersections of Van Ness/Geary and Van Ness/Post. At these intersections, pedestrian countdown signals are provided. The proposed tunnel would provide a direct underground connection between the two buildings, and would eliminate the need for employees, patients, and visitors to exit the buildings to make deliveries or visit various departments on the campus (e.g., a doctor's office in the MOB and a diagnostic room in the hospital).

A pedestrian crosswalk analysis was conducted for the crosswalks adjacent to the Cathedral Hill Campus for Midday and p.m. peak-hour conditions. The new pedestrian trips, including intra-campus pedestrian trips, were distributed to the street network based on the transit lines that would be used, and projected origins and destinations. Table 4.5-25, "Pedestrian Crosswalk LOS Analysis for the Proposed Cathedral Hill Campus—Midday Peak Hour Conditions" (page 4.5-133), and Table 4.5-26, "Pedestrian Crosswalk LOS Analysis for the Proposed Cathedral Hill Campus—P.M. Peak-Hour Conditions" (page 4.5-134), present the results of the Existing

Table 4.5-25
Pedestrian Crosswalk LOS Analysis for the Proposed Cathedral Hill Campus—Midday Peak-Hour Conditions

Intersection/ Crosswalk	Existing			Existing plus Project		
	Pedestrian Volume	Square feet per pedestrian	LOS	Pedestrian Volume	Square feet per pedestrian	LOS
Franklin/Geary						
North	34	>60	A	48	>60	A
South	37	>60	A	50	>60	A
East	72	>60	A	78	>60	A
West	40	>60	A	46	>60	A
Franklin/Post						
North	130	52	B	154	44	B
South	118	58	B	142	48	B
East	101	>60	A	104	>60	A
West	97	>60	A	115	>60	A
Van Ness/O'Farrell						
North	118	>60	A	124	>60	A
South	144	>60	A	154	>60	A
East	358	30	C	373	29	C
West	211	52	B	244	45	B
Van Ness/Geary						
North	117	>60	A	259	>60	A
South	79	>60	A	98	>60	A
East	511	24	C	563	22	D
West	294	43	B	513	24	C
Van Ness/Post						
North	147	>60	A	177	>60	A
South	109	>60	A	204	>60	A
East	371	29	C	387	28	C
West	239	47	B	297	38	C
Van Ness/Sutter						
North	256	>60	A	274	>60	A
South	304	60	B	323	56	B
East	110	>60	A	123	>60	A
West	99	>60	A	144	45	B

Source: Data compiled by Fehr & Peers in 2010

Table 4.5-26
Pedestrian Crosswalk LOS Analysis for the Proposed Cathedral Hill Campus—
P.M. Peak-Hour Conditions

Intersection/ Crosswalk	Existing			Existing plus Project		
	Pedestrian Volume	Square feet per pedestrian	LOS	Pedestrian Volume	Square feet per pedestrian	LOS
Franklin/Post						
North	135	51	B	157	44	B
South	96	>60	A	118	58	B
East	64	>60	A	67	>60	A
West	90	>60	A	107	>60	A
Van Ness/Geary						
North	258	>60	A	387	45	B
South	109	>60	A	126	>60	A
East	485	26	C	532	23	D
West	425	29	C	625	20	D
Van Ness/Post						
North	194	>60	A	221	>60	A
South	212	>60	A	298	52	B
East	480	22	D	494	21	D
West	302	37	C	355	31	C

Source: Data compiled by Fehr & Peers in 2010

and Existing plus Cathedral Hill Campus project conditions for the Midday and p.m. peak hours, respectively. During the Midday and p.m. peak hours, all study crosswalks in the Cathedral Hill Campus vicinity would continue to operate at acceptable levels of service (LOS D or better).

Since the new pedestrian trips would not result in substantial overcrowding on the sidewalks and crosswalks, or result in hazardous conditions, **the project's impact on pedestrians would be less than significant**.

While the impact on pedestrians would be less than significant, implementation of Improvement Measure I-TR-40 below would further reduce the less-than-significant impact by requiring pedestrian countdown signals at intersections in the immediate vicinity of the campus. Two of the eight intersections adjacent to the project blocks currently have pedestrian countdown signals (Van Ness/Geary and Polk/Geary).

Improvement Measure I-TR-40 Install Pedestrian Countdown Signals

As an improvement measure to facilitate pedestrian movements, SFMTA should install pedestrian countdown signals for all directions at the signalized intersections of Franklin/Sutter, Franklin/Post, Franklin/Geary, Van Ness/Sutter, Van Ness/Post, and Polk/Post.

IMPACT TR-41 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would not result in substantial overcrowding on public sidewalks, create hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the project site or adjoining areas. (Less than Significant)*

Under the Two-Way Post Street Variant, pedestrian conditions would be the same as under the proposed LRDP described in Impact TR-40. The project would include widened sidewalks (as illustrated on Figure 4.5-20 on page 4.5-131), and the new pedestrian trips generated by the proposed Cathedral Hill Campus would not result in substantial overcrowding on the sidewalks and crosswalks, or result in hazardous conditions. Therefore, **the Two-Way Post Street Variant's impact on pedestrians would be less than significant**.

Although the impact on pedestrians would be less than significant, implementation of Improvement Measure I-TR-40 would further reduce the less-than-significant impact by providing pedestrian countdown signals at six intersections in the immediate vicinity of the campus.

IMPACT TR-42 *Implementation of the Cathedral Hill Campus project MOB Access Variant would result in a pedestrian hazard impact at the proposed MOB's driveway on Geary Street. (Significant and Unavoidable with Mitigation)*

Under the MOB Access Variant, pedestrian conditions would be similar to the proposed LRDP project described in Impact TR-40, with the exception of pedestrian conditions on Geary Street between Van Ness Avenue and Polk Street. The MOB Access Variant would reconfigure the proposed Cathedral Hill MOB access driveway on Geary Street to permit both ingress and egress (the LRDP project would include ingress-only from Geary Street). Analysis of the project driveway conducted for p.m. peak-hour conditions indicated that permitting ingress and egress onto Geary Street would create traffic hazards for vehicles and pedestrians.

The block of Geary Street adjacent to the proposed Cathedral Hill MOB, between Polk Street and Van Ness Avenue, is expected to experience increased congestion in the future, especially in the volume of vehicles turning right from Geary Street westbound onto Van Ness Avenue northbound. In addition, pedestrian volumes on Geary Street are expected to increase because of the patients, visitors, and doctors destined to the proposed Cathedral Hill Campus, as well as expected growth in the Van Ness and Japantown neighborhoods. Vehicular congestion on Geary Street would require vehicles exiting the garage to execute aggressive and potentially unsafe maneuvers to enter the vehicle queue, which could potentially endanger pedestrians on the sidewalk. During congested conditions, vehicles attempting to exit the garage would likely block the sidewalk, as they forced their way into the queue. This would result in hazardous conditions for pedestrians and could interfere with pedestrian accessibility, particularly for vulnerable pedestrians such as the elderly and disabled who could be expected to visit a medical campus. **Thus, the MOB Access Variant's impact related to pedestrian hazards would be considered significant.**

Mitigation Measure MM-TR-17 described on page 4.5-111 would include pedestrian warning devices, a stop sign, and a notice for drivers exiting the garage to yield the right-of-way to pedestrians. In addition, during peak periods of MOB activity, a traffic control attendant would be positioned in the vicinity of the driveway to help minimize pedestrian-vehicle conflicts on the driveway. With implementation of Mitigation Measure MM-TR-17, impacts related to pedestrian hazards would be reduced, however not to a less-than-significant level. Measures that limit vehicular access onto Geary Street, such as those included as part of the proposed LRDP project (e.g., MOB garage egress onto Cedar Street only), would be required to fully mitigate the impact. Therefore, **the MOB Access Variant's impact on traffic hazards would remain significant and unavoidable**.

IMPACT TR-43 *Implementation of the Cathedral Hill Campus project would not result in a loading demand during the peak hours of loading activities that could not be accommodated within the proposed loading supply, or within on-street loading zones. (Less than Significant)*

At buildout of the proposed Cathedral Hill Campus, a total of 20 on-site loading spaces would be provided, including 18 spaces at the proposed Cathedral Hill Hospital (one space for trucks up to 55 feet in length, three spaces for trucks up to 45 feet in length, and 14 spaces for vans and smaller vehicles 20 feet long or shorter) and two at the Cathedral Hill MOB. The proposed 1375 Sutter MOB would not contain any off-street loading spaces, and would rely on the existing on-street commercial vehicle loading/unloading spaces located on Sutter Street. Deliveries for the Cathedral Hill MOB and the 1375 Sutter MOB that occur at the Cathedral Hill Hospital loading dock off of Franklin Street would be transported either through the proposed tunnel or by smaller trucks or vans between the buildings.

The CPMC LRDP includes a proposed Truck Management Plan for the Cathedral Hill Campus to efficiently manage the loading facilities to ensure that the daytime loading demand is accommodated. The plan would include the following measures:

- Extend dock operating hours to 24-hours/day to accommodate the demand which is currently confined between 7 a.m. and 7 p.m. at the Pacific and California campuses.

- Actively manage loading areas 24-hours/day to ensure that trucks park efficiently and do not dwell in loading spaces.

- Deliveries from the West Bay Distribution Center (the centralized-CPMC delivery center) would be scheduled to occur between 7:00 p.m. and 7:00 a.m. to minimize conflicts with non-CPMC couriers.

- Deliveries, such as laundry services, medical supplies, linen processors, and trash haulers, would be scheduled before 7 a.m. or after 7 p.m. to minimize conflicts with other couriers.

- Vehicles longer than 55 feet would be prohibited from entering the loading dock at the hospital.

- Various waste pick-up would be scheduled and dock space would be dedicated to minimize the impact of truck visits during peak traffic hours (e.g., would occur between 4 and 5 a.m.). The Cathedral Hill MOB would have a dedicated trash room that would be accessed via the service driveway on Cedar Street.

Table 4.5-27, "Summary of Service Vehicle and Truck Loading/Unloading Space Supply and Demand by Campus," presents a comparison of the proposed loading supply to the loading demand for the proposed Cathedral Hill Campus buildings. During the peak hour of loading activity, the Cathedral Hill Hospital would have a loading demand for 19 spaces, which, compared to a loading supply of 18 spaces, would result in a shortfall of one space. This shortfall would be managed through scheduling of deliveries such that the loading demand does not exceed the 18-space supply.

Table 4.5-27
Summary of Service Vehicle and Truck Loading/Unloading Space Supply and Demand by Campus

	Loading Space Supply	Loading Space Demand	Surplus/(Shortfall)
Cathedral Hill Campus			
Cathedral Hill Hospital	18	19	(1)
Cathedral Hill MOB	2	4	(2)
1375 Sutter	0	1	(1)
Total	20	24	(4)
Pacific Campus			
Buildout	9	9	0
Davies Campus			
Buildout	4	8	(4)
St. Luke's Campus			
Buildout	5	5	0

Source: Data compiled by Fehr & Peers in 2010

At the Cathedral Hill MOB, during the peak hour of loading activity there would be a loading demand for four spaces, which, compared to the loading supply of two spaces would result in a shortfall of two spaces. This shortfall would be managed through scheduling of deliveries. The shortfall could also be accommodated in the on-street loading spaces in the vicinity of the proposed Cathedral Hill MOB.

The conversion of the 1375 Sutter Street, Pacific Plaza Office Building into the 1375 Sutter MOB would not require new construction and would involve conversion of an existing building that has an existing loading space deficiency, and according to the San Francisco Planning Code, this lawful existing deficiency could be carried forward and the proposed 1375 Sutter MOB would not be required to provide any off-street loading space. The loading demand of one space during the peak hour of loading operations would be accommodated, similar to existing conditions, at the existing commercial vehicle loading/unloading zone along Sutter Street. Garbage pickups for this building would occur from Daniel Burnham Court located on the south side of the building. **The project's impact related to loading operations at the hospital, MOB, and at 1375 Sutter Street would be less than significant**.

IMPACT TR-44 *Implementation of the Cathedral Hill Campus project and subsequent operation of the Cathedral Hill Hospital off-street loading facility could result in potentially hazardous conditions on Franklin Street. (Less than Significant with Mitigation)*

The Cathedral Hill Campus would have a centralized on-site loading dock located within the Cathedral Hill Hospital. The main entrance to this loading dock would be from separate entrance and exit driveways on Franklin Street. The service dock in this portion of the hospital can accommodate six large trucks at separate loading bays, including two separate trash loading docks. Additional loading spaces would be located within the garage on the first below grade level, and would accommodate smaller delivery and service vehicles such as vans (e.g., flower deliveries). Access by smaller trucks to below-grade levels would occur from Post Street and Geary Boulevard. Of the 19 total trucks expected during the peak period at the Cathedral Hill Hospital, approximately eight would be over 20 feet long.

The on-site loading area would be large enough for trucks up to 55 feet in length to enter front-first from Franklin Street into the loading space within the building. Prior to entering the loading area, the truck would need to come to a stop in the second travel lane. An attendant would need to temporarily stop on-coming traffic on Franklin Street while the truck maneuvered into the dock. Once inside the loading area, a truck up to 55-feet long could maneuver into the loading spaces. To exit, trucks would pull out of the loading area front-first onto Franklin Street.

Because Franklin Street is a major arterial street with large platoons of vehicles during significant portions of the day, stopping these vehicles, even if only briefly, may cause vehicle queues to form and extend into upstream intersections (e.g., Franklin Street/Geary Street) and interrupt intersection operations. It may result in a safety issue if vehicles stuck at an intersection decide to maneuver around other vehicles to move out of oncoming cross traffic. Therefore, **the project's impact related to loading operations at the off-street loading facility on Franklin Street would be a significant impact**.

Mitigation Measure MM-TR-44 Loading Dock Restrictions and Attendant

> To minimize the potential disruptions to intersections operations and safety, CPMC shall schedule delivery trucks longer than 46 feet in length to only arrive and depart between 10 p.m. and 5 a.m., when traffic volumes on Franklin Street are lower and when there would be a less likely chance that queues would form behind the truck and extend into adjacent intersections. Because some disruption may still occur between 10 p.m. and midnight, CPMC shall monitor and document truck deliveries occurring between 10 p.m. and midnight for a period of 6 months following full building occupancy/program implementation, recording truck size, number of lanes blocked by delivery trucks and for how long, and whether operations at the intersection of Franklin/Geary are temporarily affected and for how long. CPMC shall submit the truck loading report to the Planning Department and SFMTA. Based on the truck loading report and review, the deliveries by trucks longer than 46 feet in length may be modified. An attendant at the loading dock shall also be present to stop on-coming traffic while delivery trucks maneuver into the service loading area.

Implementation of this mitigation measure would reduce the impacts related to loading operations for trucks 46-feet or longer and, therefore, **the project impact of the Cathedral Hill Hospital's loading facility to create hazardous conditions on Franklin Street traffic operations would be less than significant with mitigation**.

IMPACT TR-45 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would not result in a loading demand during the peak hours of loading activities that could not be accommodated within the proposed loading supply, or within on-street loading zones. (Less than Significant)*

Under the Two-Way Post Street Variant, which would change Post Street between Gough Street and Van Ness Avenue from one-way eastbound to two-way operations, loading supply and demand would be the same as for the proposed Cathedral Hill Campus Project, and loading impacts would be the same as identified for the project in Impact TR-43. For the proposed hospital, MOB, and 1375 Sutter Street facilities, loading demand would be accommodated within the proposed supply, or within existing on-street commercial vehicle loading/unloading zones. **The Two-Way Post Street Variant impact related to loading operations at the proposed hospital, MOB, and at 1375 Sutter Street would be less than significant.**

IMPACT TR-46 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant and subsequent operation of the Cathedral Hill Hospital off-street loading facility could result in potentially hazardous conditions on Franklin Street. (Less than Significant with Mitigation)*

Under the Two-Way Post Street Variant, the off-street loading dock located within the proposed Cathedral Hill Hospital would remain the same as for the proposed Cathedral Hill Campus project and, therefore, the impact related to the off-street loading facility operations would be the same as described in Impact TR-44.

As noted above, large trucks accessing the loading dock would need to maneuver into adjacent travel lanes, which might cause vehicle queues to form and extend into upstream intersections and interrupt operations at the intersection of Franklin/Geary. Therefore, **the Two-Way Post Street Variant impact related to loading operations at the off-street loading facility on Franklin Street would be a significant impact**.

Implementation of Mitigation Measure MM-TR-44 (Loading Dock Restrictions and Attendant) would reduce the impacts related to loading operations for trucks that are 46 feet or longer and, therefore, **the Two-Way Post Street Variant impact of the Cathedral Hill Hospital's loading facility to create hazardous traffic conditions on Franklin Street would be less than significant with mitigation**.

IMPACT TR-47 *Implementation of the Cathedral Hill Campus project MOB Access Variant would not result in a loading demand during the peak hours of loading activities that could not be accommodated within the proposed loading supply, or within on-street loading zones. (Less than Significant)*

Under the MOB Access Variant, which would reconfigure Cedar Street between Van Ness Avenue and the MOB garage driveway from two-way to one-way eastbound operations and would permit both ingress and egress via the Geary Street driveway, loading supply and demand would be the same as for the proposed Cathedral Hill Campus Project, and loading impacts would be the same as identified for the project in Impact TR-43. For the proposed hospital, MOB, and 1375 Sutter Street facilities, the loading demand would be accommodated within the proposed supply or existing on-street commercial vehicle loading/unloading zones. **The MOB Access Variant's impact related to loading operations at the proposed hospital, MOB, and 1375 Sutter Street facilities would be less than significant.**

IMPACT TR-48 *Implementation of the Cathedral Hill Campus project MOB Access Variant and subsequent operation of the Cathedral Hill Hospital off-street loading facility could result in potentially hazardous conditions on Franklin Street. (Less than Significant with Mitigation)*

Under the MOB Access Variant, the off-street loading dock located adjacent to the proposed Cathedral Hill Hospital would remain the same as for the proposed Cathedral Hill Campus project and, therefore, the impact related to the off-street loading facility operations would be the same as described in Impact TR-44.

As noted above, large trucks accessing the loading dock would need to maneuver into adjacent travel lanes, which might cause vehicle queues to form and extend into upstream intersections and interrupt operations at the intersection of Franklin/Geary. Therefore, **the MOB Access Variant impact related to loading operations at the off-street loading facility on Franklin Street would be a significant impact**.

Implementation of Mitigation Measure MM-TR-44 (Loading Dock Restrictions and Attendant) would reduce the impacts related to loading operations for trucks that are 46 feet or longer and, therefore, **the Two-Way Post Street Variant impact of the Cathedral Hill Hospital's loading facility to create hazardous traffic conditions on Franklin Street would be less than significant with mitigation**.

IMPACT TR-49 *Implementation of the Cathedral Hill Campus project relevant to the passenger loading/unloading demand would be accommodated within the proposed passenger loading/unloading zones, and would not create potentially hazardous conditions. (Less than Significant)*

Figure 4.5-21, "Cathedral Hill Campus—Proposed Passenger Zones" (page 4.5-143), presents the passenger loading/unloading areas for the Cathedral Hill Hospital and the Cathedral Hill MOB. Table 4.5-28, "Summary of Passenger Loading/Unloading Zone Supply and Demand by Campus" (page 4.5-144), presents a comparison of the proposed passenger loading/unloading supply to the demand.

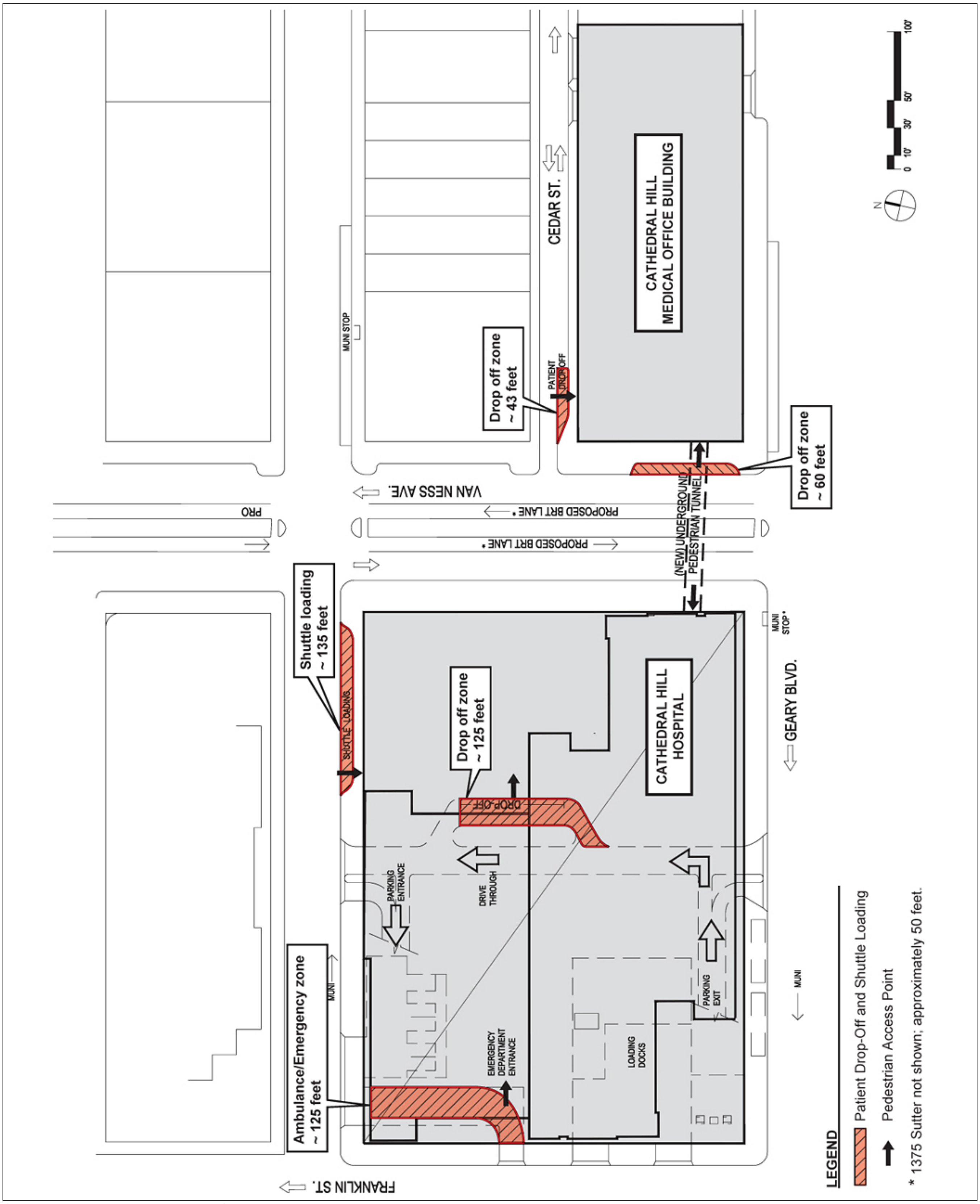
The proposed Cathedral Hill Hospital would have an interior passenger loading/unloading zone, approximately 125 in length, which would be accessible from Geary Street and Post Street. This passenger zone could accommodate approximately five vehicles at one time. There would be a separate travel lane to allow for passenger cars to bypass stopped vehicles. The emergency room would have a separate passenger loading/unloading zone accessible from Franklin Street, which would contain 125 feet each along two aisles, for approximately 250 feet of effective passenger loading/unloading. Together, these two areas would provide 375 feet of loading/unloading space that could accommodate approximately 15 vehicles. As indicated in Table 4.5-28, during both the a.m. and p.m. peak hours, the hospital passenger loading demand would be accommodated within the proposed supply.

Therefore, **the proposed project's impact related to passenger loading/unloading activities would be less than significant**.

The proposed Cathedral Hill MOB would have a recessed on-street passenger loading/unloading zone on Cedar Street that would provide approximately 43 feet in length, and a passenger loading/unloading zone on Van Ness Avenue of about 60 feet in length.[32] This zone could accommodate approximately four vehicles at one time. As indicated in Table 4.5-28, the MOB is expected to have a peak loading demand of 114 feet in the a.m. peak hour and 253 feet in the p.m. peak hour, and the estimated demand would exceed the proposed supply. CPMC plans to actively manage the passenger loading/unloading zones to direct drivers to leave the passenger zone and enter the parking garage, if there is additional demand that needs to be accommodated at the curb. The time-limited passenger loading/unloading zone within the MOB garage would accommodate four vehicles. Because the on-street passenger loading/unloading activities on Cedar Street and Van Ness Avenue would be actively monitored, and since additional passenger loading/unloading would be provided within the Cathedral Hill MOB parking garage, **the proposed Cathedral Hill MOB's impacts related to passenger loading/unloading activities would be less than significant**.

The 1375 Sutter MOB would have an exterior passenger loading area of approximately 50 feet, as it does today, that can approximate two vehicles. The MOB is expected to have a peak loading demand for between 80 and 88 feet, which would exceed the supply. CPMC would actively manage the passenger loading/unloading zone and, if the passenger loading demand was greater than the curbside capacity, CPMC personnel would direct drivers to leave the passenger zone and enter the parking garage. Therefore, **the proposed 1375 Sutter MOB impacts related to passenger loading/unloading activities would be less than significant**.

[32] The proposed 60-foot passenger zone would displace two existing on-street loading spaces.



Source: Data compiled by Fehr & Peers in 2010

Cathedral Hill Campus—Proposed Passenger Zones **Figure 4.5-21**

Table 4.5-28
Summary of Passenger Loading/Unloading Zone Supply and Demand by Campus—P.M. Peak Hour

	Length in Feet of Loading Supply	Length in Feet of Loading Demand	Surplus or Shortfall (in feet)
Cathedral Hill Campus [1]			
Cathedral Hill Hospital	375	(60) 75	(+315)+300
Cathedral Hill MOB	103	(114) 253	(-11)-150
1375 Sutter	50	(40) 88	(+10)-38
Pacific Campus [3]			
Buildout Conditions [2]	620	625	-5
Davies Campus [4]			
Buildout Conditions [2]	497	218	+279
St. Luke's Campus [5]			
Buildout Conditions [2]	350	253	+97

Notes:
1 For the Cathedral Hill Campus, a.m. peak-hour conditions are presented in parentheses.
2 Buildout conditions represent activity associated with new facilities and existing uses that would remain.
3 Pacific Campus passenger loading/unloading facilities include curbside loading zones totaling 500 feet in length within existing on-street passenger loading/unloading zones on Webster, Buchanan, and Sacramento Streets, as well as a new loading area in the proposed North-of-Clay Aboveground Parking Garage and 120 feet of additional on-street passenger loading/unloading on Buchanan Street.
4 Davies Campus passenger loading/unloading facilities include curbside loading zones totaling 377 feet in length located along the existing campus driveways, plus six short-term parking spaces dedicated to passenger loading/unloading activities located in the lower surface parking lot near the proposed Neuroscience Institute building.
5 St. Luke's Campus passenger loading/unloading facilities include curbside loading zones totaling about 350 feet in length on Cesar Chavez Street, 27th Street, Valencia Street, and at the proposed MOB/Expansion Building.
Source: Data compiled by Fehr & Peers in 2010

IMPACT TR-50

Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant relevant to passenger loading/unloading demands would be accommodated within the proposed passenger loading/unloading zones and would not create potentially hazardous conditions. (Less than Significant)

For the Two-Way Post Street Variant, the impacts associated with passenger loading/unloading demand would be the same as under the proposed LRDP described in Impact TR-49. Passenger loading/unloading demands would be accommodated within the proposed and existing passenger loading zones and, therefore, **the Two-Way Post Street Variant impacts related to passenger loading/unloading activities at the proposed Cathedral Hill Campus would be less than significant**.

IMPACT TR-51 *Implementation of the Cathedral Hill Campus project MOB Access Variant relevant to passenger loading/unloading demands would be accommodated within the proposed passenger loading/unloading zones, and would not create potentially hazardous conditions. (Less than Significant)*

For the MOB Access Variant, the impacts associated with passenger loading/unloading demand would be similar to the proposed LRDP project described in Impact TR-49. The exception would be the location of passenger loading/unloading facilities at the proposed Cathedral Hill MOB. Similar to the proposed LRDP, a passenger loading/unloading zone on Van Ness Avenue would also be provided. Under the MOB Access Variant, Cedar Street would remain one-way eastbound and a 125-foot-long passenger loading/unloading zone would be provided (as compared with a 43-foot-long zone under the proposed LRDP). Similar to the proposed LRDP project, the on-street passenger loading/unloading activities on Cedar Street and Van Ness Avenue would be actively monitored. Under the MOB Access Variant, the passenger loading/unloading demand would be accommodated within the proposed and existing passenger loading zones and, therefore, **the MOB Access Variant impacts related to passenger loading/unloading activities at the proposed Cathedral Hill Campus would be less than significant**.

IMPACT TR-52 *Implementation of the Cathedral Hill Campus project would not result in a significant emergency vehicle access impact. (Less than Significant)*

With implementation of the CPMC LRDP, the proposed emergency room at Cathedral Hill Hospital would replace the existing emergency rooms at CPMC's California and Pacific Campuses. The proposed Cathedral Hill Hospital would have a separate designated entrance for the Emergency Department and emergency vehicles. The Cathedral Hill Campus is expected to receive between 8,400 and 9,600 emergency calls, or about half of all emergency patients within the CPMC system, per year.[33]

Patients in emergency transport are typically delivered to the nearest emergency room with available space and capability to address a patient's need for medical care (for example, not all hospitals can treat trauma, neurological or stroke patients). The proposed Cathedral Hill Hospital would be slightly less than 1 mile from the existing Pacific Campus and is centrally located along major routes to many neighborhoods. Likely routes to the Cathedral Hill Hospital, as described in the TransOptions report include:

[33] TransOptions. 2009 (July 17). City of San Francisco Fire Department 911 Emergent Transports to CPMC Campuses: 2004, 2008, 2015. El Cajon, CA.

- Geary Boulevard/Street
- Franklin Street
- Gough Street
- Van Ness Avenue
- Turk Street
- Bush Street
- Oak Street

These streets are multi-lane arterial roadways that allow the emergency vehicles to travel at higher speeds and permit other traffic to maneuver out of the path of the emergency vehicle.[34] Because Franklin Street, Van Ness Avenue, Post Street, and Bush Street have multiple lanes, vehicles would be able to yield to emergency vehicles destined to the proposed Cathedral Hill Campus. Given the above, **the proposed Cathedral Hill Campus project emergency vehicle access impact would be less than significant**.

IMPACT TR-53 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would not result in a significant emergency vehicle access impact. (Less than Significant)*

The Two-Way Post Street Variant would convert Post Street between Van Ness Avenue and Gough Street from one-way eastbound operations to two-way operations. Post Street is currently a two-way operation west of Gough Street, and one-way eastbound east of Gough Street. Under the Two-Way Post Street Variant, the hospital driveway on Post Street would be reconfigured to allow full ingress and egress onto Post Street from both the eastbound and westbound directions. Converting Post Street to a two-way operation would increase accessibility to the Emergency Department from Van Ness Avenue. In particular, ambulances traveling southbound on Van Ness Avenue would be able to turn right onto Post Street westbound to access the dedicated off-street ambulance parking area (instead of continuing south on Van Ness Avenue to Geary Boulevard, west on Geary Boulevard to Franklin Street, north on Franklin Street to Post Street, and turning right onto Post Street eastbound). Ambulances would also be able to access the parking area from Franklin Street and Gough Street via Post Street.

Converting Post Street to a two-way operation would not affect access to the Emergency Department from either Franklin Street or Post Street, and would improve access from Van Ness Avenue; therefore, **the proposed project's impact on emergency vehicle access would be less than significant**.

IMPACT TR-54 *Implementation of the Cathedral Hill Campus project MOB Access Variant would not result in a significant emergency vehicle access impact. (Less than Significant)*

Under the MOB Access Variant, the proposed Cathedral Hill Hospital Emergency Department would remain the same as under the proposed LRDP and, therefore, the impact related to emergency vehicle access would be the same as described in Impact TR-52. Reconfiguring Cedar Street to a one-way eastbound operation and permitting

[34] Per the California Vehicle Code, Section 21806, all vehicles must yield right-of-way to emergency vehicles, and remained stopped until the emergency vehicle has passed.

ingress and egress from the MOB garage onto Geary Street would not affect access to the Emergency Department from either Franklin Street or Post Street and, therefore, **the MOB Access Variant's impact on emergency vehicle access would be less than significant**.

IMPACT TR-55 *Implementation of the Cathedral Hill Campus project would result in a transportation impact in the project vicinity resulting from construction vehicle traffic and construction activities that would affect the transportation network. (Significant and Unavoidable with Mitigation)*

The proposed Cathedral Hill Hospital and Cathedral Hill MOB would be constructed over approximately 54 months. Construction activities would take place generally between 7 a.m. and midnight on weekdays and between 7 a.m. and 5 p.m. on Saturdays, depending on the phase of construction, and whether after-hour construction permits, when required for work after 8 p.m., are approved by the City. The proposed underground tunnel between the Cathedral Hill hospital and MOB would be located under Van Ness Avenue between Post Street and Geary Street, approximately 50 feet north of Geary Street. Construction staging for the hospital and MOB would occur on site, with some materials and equipment stored at off-site facilities outside of the City of San Francisco. Preliminary construction information for the Cathedral Hill Campus was prepared by Herrero Boldt.

Figure 4.5-22, "Cathedral Hill Campus—Construction Activity Summary" (page 4.5-149), illustrates the lane closures, sidewalk closures, construction gates, and truck routes that are expected to occur at the construction site. In general, lane and sidewalk closures as a part of construction activity must meet the City's *Regulations for Working in San Francisco Streets* (SFMTA Blue Book) and are subject to review and approval by the Department of Public Works (DPW) and the City's Interdepartmental Staff Committee on Traffic and Transportation (ISCOTT). In addition, since Van Ness Avenue is part of U.S. 101, construction activities affecting Van Ness Avenue would also be subject to Caltrans review and approval.

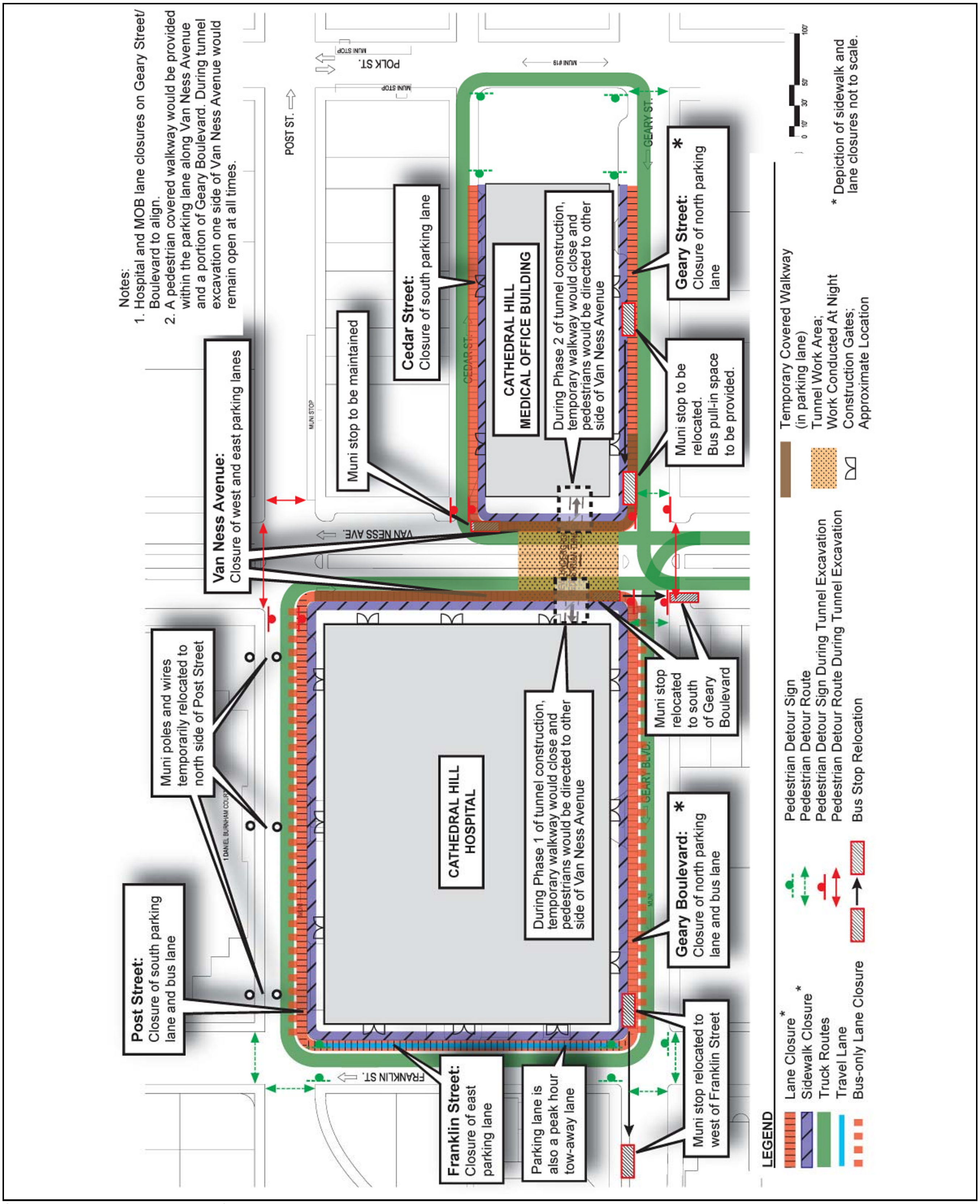
Construction Workers by Shift—During construction of the Cathedral Hill Campus the maximum worker population would range between 80 (during demolition) and 735 workers (during interior finishing). A majority of these workers (about 80 percent) would be working on the Cathedral Hill Hospital. Work shifts would occur 7 a.m. to 4 p.m. and 4 p.m. to midnight on weekdays, and between 7 a.m. and 5 p.m. on Saturdays.

Table 4.5-29, "Cathedral Hill Campus—Worker Population by Construction Phase" (page 4.5-150), summarizes the average and maximum number of construction workers per shift per construction phase, their shift hours, construction worker parking demand, and anticipated parking locations. During construction activities, CPMC would encourage all staff and construction workers to use public transit services and ridesharing. Workers who drive would be provided assigned parking spaces in the 855 Geary Garage (about 200 spaces), other leased lots, and existing CPMC garages as well as in the Cathedral Hill Campus parking garages, as they are completed. Workers parking in off-site lots would be shuttled to the worksite via CPMC shuttles dedicated for use by construction workers. Shuttle service would start 1 hour before each shift begins and ends; and run for approximately 2 hours. Limited shuttle service would be available to workers during work hours. Up to five shuttles would be used for this specific shuttle service, each with a capacity of 30 to 40 passengers.

Workers would have dedicated drop-off and pick-up zones at the construction site. The location of these zones, as well as the overall construction traffic management plan would be coordinated with Caltrans and the SFMTA, as appropriate, prior to each phase of construction to ensure City and State requirements are met. Drop-off and pick-up would be staggered so that only one shuttle is present at a time. In case of unanticipated congestion, both the hospital and MOB construction sites would have room to accommodate up to five queued vehicles, if needed.

Construction Truck Delivery Schedule—Table 4.5-30, “Cathedral Hill Campus—Average Trucks per Day and per Shift by Construction Phase” (page 4.5-151), summarizes the average number of trucks needed to haul excavated materials and for equipment and materials deliveries to the Cathedral Hill Campus during construction. Trucks would only arrive at the campus during construction shifts. As indicated in Table 4.5-30, between 100 and 320 trucks would travel to the Cathedral Hill site per day, with the greatest number of trucks arriving during the excavation and foundation phases.

Local Intersection Operations during Construction—Due to the scale of the Cathedral Hill Campus project, additional construction-related traffic may temporarily increase driver delay at intersections near the construction site. To estimate intersection operations during the construction project, intersection level of service was calculated for the a.m. and p.m. peak hour during the excavation phase of construction—the phase that would experience the greatest number of truck trips. The excavation phase is expected to occur over a 6-month period for the new hospital, and over a 7-month period for the new MOB, and would overlap during a 4-month period. Traffic increases due to construction workers going to and from the site was not included in this analysis since most construction shifts would begin and end before the peak hour. Table 4.5-31, “Cathedral Hill Campus Truck Generation—Excavation Phase,” summarizes the total number of trucks arriving at the construction site during the peak hours.



Source: Data compiled by Fehr & Peers in 2010

Cathedral Hill Campus—Construction Activity Summary **Figure 4.5-22**

Table 4.5-29
Cathedral Hill Campus—Worker Population by Construction Phase

Building	Demolition	Excavation	Foundation	Structure	Exterior	Interior
Cathedral Hill Hospital						
Average # of Workers per Shift	37	42	64	165	61	487
Maximum # of Workers per Shift	72	69	64	236	84	601
Shift Hours	7 a.m.–4 p.m.; 4 p.m.–midnight; 7 a.m.–5 p.m. (Sat)	7 a.m.–4 p.m.; 4 p.m.–midnight; 7 a.m.–5 p.m. (Sat)	7 a.m.–4 p.m.; 4 p.m.–midnight; 7 a.m.–5 p.m. (Sat)	7 a.m.–4 p.m.; 4 p.m.–midnight; 7 a.m.–5 p.m. (Sat)	7a.m.–5 p.m.; 7 a.m.–5 p.m. (Sat)	7 a.m.–4 p.m.; 4 p.m.–midnight; 7 a.m.–5 p.m. (Sat)
Worker Parking Locations	1375 Sutter; 855 Geary; 1600 Geary	1375 Sutter; 855 Geary; 1600 Geary	1375 Sutter; 855 Geary; 1600 Geary	1375 Sutter; 855 Geary; 1600 Geary; CH MOB	1375 Sutter; 855 Geary; 1600 Geary; CH MOB	1375 Sutter; 855 Geary; 1600 Geary; CH MOB
# of Parking Spaces[1]	54	52	48	177	63	451
Cathedral Hill MOB						
Average # of Workers per Shift	9	15	25	46	53	91
Maximum # of Workers per Shift	11	20	30	97	82	134
Shift Hours	7 a.m.–5 p.m.; 7 a.m.–5 p.m. (Sat)	7 a.m.–5 p.m.; 7 a.m.–5 p.m. (Sat)	7 a.m.–5 p.m.; 5 p.m.–midnight; 7 a.m.–5 p.m. (Sat)	7 a.m.–5 p.m.; 5 p.m.–midnight; 7 a.m.–5 p.m. (Sat)	7 a.m.–5 p.m.; 7 a.m.–5 p.m. (Sat)	7 a.m.–5 p.m.; 7 a.m.–5 p.m. (Sat)
Worker Parking Locations	1375 Sutter; 855 Geary; 1600 Geary	1375 Sutter; 855 Geary; 1600 Geary	1375 Sutter; 855 Geary; 1600 Geary	1375 Sutter; 855 Geary; 1600 Geary; CH MOB	1375 Sutter; 855 Geary; 1600 Geary; CH MOB	1375 Sutter; 855 Geary; 1600 Geary; CH MOB
# of Parking Spaces[1]	9	16	24	78	66	107

Notes:
[1] Worker parking demand was estimated using mode split assumptions developed from the Bay Area Transportation State of the System, 2006, the Metropolitan Transportation Commission, 2007, and Caltrans, 2007. CPMC would lease dedicated parking spaces for these workers to ensure that demand could be met.
Source: Data compiled by Herrero Boldt in 2010

Table 4.5-30
Cathedral Hill Campus—Average Trucks per Day and per Shift by Construction Phase

Building	Demolition	Excavation	Foundation	Structure	Exterior	Interior
Cathedral Hill Hospital						
Trucks per Shift	35	135	15	35	15	15
Trucks per Day	55	220	152	110	25	25
Cathedral Hill MOB						
Trucks per Shift	25	50	10	12	15	10
Trucks per Day	40	100	160	130	25	15

Source: Data compiled by Herrero Boldt in 2010

Table 4.5-31
Cathedral Hill Campus Truck Generation—Excavation Phase

Building	Average # of Trucks per Shift[1]	% of Arriving in Peak Hour[2]	# of Trucks during the Peak Hour	PCE per Peak Hour[3,4]
Cathedral Hill Hospital	135	15%	20	55
Cathedral Hill MOB	50	15%	8	20
Total	**185**	**–**	**28**	**75**

Notes:
1 Herrero Boldt 2009.
2 Assumed to be distributed evenly throughout the day, with a break for lunch and at 3 p.m.
3 PCE rate = 2.7 [from *Sacramento Recycling and Transfer Station EIR* (Fehr & Peers for the City of Sacramento 1998, 2006) and *Turk Island Consolidation Traffic Impact Analysis* (Fehr & Peers, 2009)]
4 60 percent inbound/ 40 percent outbound during the a.m. peak hour; 40 percent inbound/60 percent outbound during the p.m. peak hour. MOB construction shifts only generate trucks during the a.m. peak hour.
Source: Data compiled by Fehr & Peers in 2010

Approximately 185 trucks per shift would arrive at the construction site during the excavation phase, and assuming that 15 percent of these trucks would arrive during the peak hours, a total of 28 trucks would arrive during the peak a.m. and p.m. peak hours. Since a significant portion of the construction vehicle trips would be via large and heavy vehicles, the number of vehicles added to the intersection analysis was adjusted to reflect the impact of larger trucks on roadway capacity. Trucks were converted into passenger car equivalents (PCEs) based on the size and carrying capacity of vehicles. According to the Transportation Research Board's Special Report, 223 heavy-vehicles range from 1.5 to 3.7 PCEs with a PCE rate of 2.7 was applied for earthmoving vehicles/dump trucks/haulers for this study.

Trucks were assumed to arrive at the construction site at regular intervals throughout work shifts, i.e., there would be no peak hour of truck arrivals because truck arrivals would be consistent throughout the day. By applying the

PCE rate to the estimated number of trucks during the peak hour, the proposed construction plan would generate approximately 75 PCE during the peak hour during the excavation phase.

Truck Access Routes to and from the Cathedral Hill Campus Site—As part of the City's SFMTA Blue Book, CPMC would be required to identify truck routes to and from the Cathedral Hill Campus prior to construction for City review and approval. Truck routing around the construction site are shown in Figure 4.5-22 (page 4.5-149).

Trucks would travel to the construction site from various parts of the Bay Area, depending on the type of material being hauled and the size of the truck. During the excavation phase, disposal material would be transported to Brisbane, Half Moon Bay, Oakland, Richmond, and South San Francisco. In general, trucks traveling to the hospital construction site would use U.S. 101 or I-80 to the 8th Street (from the east) or 9th Street (from the south) exits in San Francisco. Within San Francisco, trucks would travel on 9th Street to Hayes Street to northbound Van Ness Avenue. From Van Ness Avenue, trucks would make a left onto Geary Street. Trucks would then enter the site at one of twelve gates around the hospital site, either on Geary Street, Franklin Street or Post Street. Trucks traveling to the MOB site would use a similar route; however, those trucks would enter the MOB site from Cedar Street or would travel around the block to enter from Geary Street.

Trucks leaving the Cathedral Hill Hospital site would exit from one of the twelve gates around the site, make an eastbound right from Post Street to Van Ness Avenue, and continue southbound to the U.S. 101 on-ramp at South Van Ness/13thStreet. Trucks leaving the MOB site would exit either from the Cedar Street gate or the Geary Street gate and make a westbound left from Geary Street onto Van Ness Avenue, and continue southbound to the U.S. 101 on-ramp at South Van Ness/13th Street.

In the case of heavy traffic, road closures or other off-site delays that may cause trucks to enter the construction site when other trucks are present, the Cathedral Hill Hospital site would have room for eight trucks to queue on the site. If trucks begin to stack, other trucks would be advised to return to their construction yard by the contractor's logistics superintendent.

Lane Closures during Construction—Construction activities would likely require sidewalk, parking lane, and bus-only lane closures during construction, as shown in Figure 4.5-22 (page 4.5-149). The location of sidewalk and lane closures is preliminary and would be subject to City review and approval prior to construction. Parking lanes would be closed throughout the construction period. These lane closures would provide a buffer between the construction site, pedestrians, and nonconstruction vehicular traffic; however, they would impact traffic and transit operations. The following lane closures would likely be required during construction:

- Van Ness Avenue, between Post Street and Geary Street (parking lane; approximately three parking spaces displaced);

- Van Ness Avenue, between Cedar Street and Geary Street (loading zone; two loading spaces displaced);

- Geary Boulevard, between Van Ness Avenue and Franklin Street (parking lane, bus-only lane, and loading zone; six parking spaces and two loading spaces displaced);

- Geary Street, between Van Ness Avenue and 300 feet east towards Polk Street (parking lane; approximately two parking spaces displaced)

- Franklin Street, between Post Street and Geary Street (parking lane; approximately 12 parking spaces displaced);

- Post Street, between Van Ness Avenue and Franklin Street (parking lane and tow-away lane, bus-only lane, passenger loading zone; approximately five parking spaces and five loading spaces displaced); and

- Cedar Street, between Van Ness Avenue and Polk Street (parking lane; approximately 10 parking spaces displaced)

Intersection Operating Conditions—Intersection level of service analysis was conducted for a.m. and p.m. peak-hour conditions, assuming the travel lane closures and construction vehicle trips during the excavation phase, when the number of construction vehicle trips would be the greatest. The excavation phases for the Cathedral Hill Hospital and the Cathedral Hill MOB is projected to occur over a 9-month period, with a 4-month overlap.

- During the a.m. peak hour, the addition of the construction vehicle trips would increase average delay per vehicle at most intersections. The intersections of Gough/Geary, Franklin/O'Farrell, Eighth/Market, and Octavia/Market/U.S. 101 would continue to operate at LOS F, and the intersection of Franklin/Bush would continue to operate at LOS E. Construction vehicle traffic would cause the intersection of Franklin/Post to deteriorate from LOS B to LOS F. Other intersections that would experience substantially greater delays due to construction vehicle traffic but that would continue to operate at LOS D or better during the a.m. peak hour include: Franklin/Geary, Van Ness/Fell, and Van Ness/Geary.

- During the p.m. peak hour, with the addition of construction vehicle trips, the intersection of Franklin/Sutter would continue to operate at LOS E. Construction vehicle traffic would cause the intersection of Franklin/Post to deteriorate from LOS B to LOS F, the intersection of Van Ness/Geary to deteriorate from LOS C to LOS E, and the intersection of 8th/Market Streets to deteriorate from LOS E to LOS F. Construction vehicle trips would not substantially affect other study intersection that would operate at LOS D or better during the p.m. peak hour.

Therefore, for a 4-month period when there is overlap in excavation between the proposed Cathedral Hill Hospital and MOB, level of service would be LOS E or LOS F at up to nine of the study intersections. Thus, **the project's construction impact on intersection operations at these nine study intersections would be significant**.

Sidewalk Closures during Construction—Construction activities would require temporary sidewalks closures adjacent to the proposed Cathedral Hill Hospital and MOB sites. Along Van Ness Avenue and Geary Street temporary (covered and lit) pedestrian walkways would be provided within the parking lane. The sidewalks on Franklin Street, Post Street, and Cedar Street would be closed, and pedestrians would be directed through signage to use the opposite side of the street. The following sidewalks adjacent to the project sites would be affected:

- Van Ness Avenue, between Post Street and Geary Street—pedestrian access maintained;
- Van Ness Avenue, between Cedar Street and Geary Street—pedestrian access maintained;
- Geary Street, between Van Ness Avenue and Franklin Street—pedestrian access restricted, pedestrians directed to use south side of Geary Street;
- Geary Street, between Van Ness Avenue and 100 feet east towards Polk Street—pedestrian access maintained to provide access and waiting area for the westbound bus stop. From approximately 100 feet and 300 feet east of Van Ness Avenue, the sidewalk would be closed and pedestrians would be directed to use the south side of Geary Street. Advance pedestrian detour signs would be provided at Van Ness Avenue and Polk Street;
- Franklin Street, between Post Street and Geary Street—pedestrian access restricted, pedestrians directed to use the west side of the street;
- Post Street, between Van Ness Avenue and Franklin Street—pedestrian access restricted, pedestrians directed to use the north side of the street; and
- Cedar Street, between Van Ness Avenue and 300 feet east towards Polk Street—pedestrian access restricted, pedestrians directed to use opposite side of the street.

Excavation for the proposed pedestrian tunnel under Van Ness Avenue would temporarily close the temporary walkways on Van Ness Avenue. When the tunnel is being excavated on the west side of Van Ness Avenue, the temporary walkway in the western parking lane would be closed during the evening construction hours and signage at Post Street and Geary Street would direct pedestrians to use the eastern side of Van Ness Avenue. During excavation under the east side of Van Ness Avenue, the temporary walkway in the eastern parking lane would close and signage at Post Street and Geary Street would direct pedestrians to use the western side of Van

Ness Avenue. Signage would also be placed on Cedar Street to direct pedestrians to use the north side of Cedar Street or use Polk Street or the opposite side of Van Ness Avenue.

Because of the number of temporary closures of sidewalks adjacent to the project sites necessitating pedestrian detours, **the proposed project would result in a significant impact on pedestrians during construction**.

Transit during Construction—In addition to the temporary closure of bus-only lanes along Geary Street and Post Street noted above, three Muni bus stops would need to be temporarily relocated:

- The existing westbound Geary Street bus stop on the northeast corner of Geary Street at Franklin Street would be relocated to the northwest corner of the intersection, requiring the temporary removal of one handicap parking space and a passenger loading/unloading zone.
- The existing southbound Van Ness Avenue bus stop on the northwest corner of Van Ness Avenue at Geary Street would be relocated to the southwest corner of the intersection, requiring the temporary removal of two parking and potentially a passenger loading/unloading zone.
- The existing westbound Geary Street bus stop located midblock between Van Ness Avenue and Polk Street would be relocated approximately 200 feet to the west within a temporary covered pedestrian walkway. As part of the project, this bus stop would be relocated west of Van Ness Avenue. The timing of relocation, whether as part of construction activities or following completion of hospital construction, would be determined by SFMTA.

The existing northbound Van Ness Avenue Muni and Golden Gate Transit stop at the approach to Cedar Street would be maintained within the temporary covered pedestrian walkway.

The bus-only lanes on eastbound Post Street between Franklin Street and Van Ness Avenue and on westbound Geary Street between Polk Street and Franklin Street would be closed during construction. During these times, Muni buses would need to merge into the mixed-flow traffic lanes for the one-block segment on Post Street, and the two-block segment on Geary Street. **Operation of buses in mixed-flow traffic at these locations would be considered a significant impact on Muni operations.**

Since the sidewalk on Post Street adjacent to the proposed Cathedral Hill Hospital site would be closed for construction activities, the existing Muni electric trolley line poles and overhead wires would need to be relocated to the north side of the street. CPMC and the construction contractor would work with SFMTA to develop a relocation plan for these Muni utilities.

Van Ness Avenue Tunnel Construction

The pedestrian tunnel between the proposed hospital and MOB would be constructed over an 18-month period, with only 10 months of work affecting Van Ness Avenue. To minimize impacts on traffic, transit, and pedestrians along Van Ness Avenue, construction activities during these 10 months would likely be limited to 7 p.m. to 5 a.m., when Van Ness Avenue is less congested. Work on the interior of the tunnel can be completed during typical construction hours (7 a.m. to 5 p.m.) because workers would not need to interrupt traffic along Van Ness Avenue. Construction activities across Van Ness Avenue would be subject to City and Caltrans review and approval.

Travel Lane Closures—At the proposed tunnel construction site, Van Ness Avenue has three travel lanes and a parking lane in each direction. Construction of the proposed tunnel would require sequential closures of two lanes of Van Ness Avenue at a time in 100-foot long segments. During the 10 months of construction affecting street operations, at least one travel lane in each direction would always be open during construction to minimize diversion of vehicles to other streets in the area. For example, initial construction would close the two western-most southbound lanes of Van Ness Avenue, leaving the left-most southbound lane open to through traffic; during this time, all northbound lanes would remain open. As work progresses from west to east across Van Ness Avenue, no more than two travel lanes would be closed at any one time.

Van Ness Avenue Operation—The effect of the lane closures during tunnel construction would be most acute at the intersections immediately upstream of the construction site; at the intersections of Van Ness/Post and Van Ness/Geary. Intersection operations would worsen upstream from the construction site, as drivers begin to position themselves to prepare for the lane closures.

To assess the impact of the lane closures on Van Ness Avenue during tunnel construction, adjacent intersections operations were analyzed for the hours between 7 p.m. and 5 a.m. Existing traffic volumes during the 7 p.m. to 5 a.m. period are greatest between 7 p.m. and 8 p.m. This is reasonable since traffic typically increases during the p.m. peak hour (5 p.m. to 6 p.m.) and slowly decreases until the next morning. Table 4.5-32, "Average Midweek Traffic Volumes on Van Ness Avenue" below, summarizes traffic volumes between 5 p.m. and 5 a.m. As shown, traffic volumes on Van Ness Avenue are greatest during the 5 to 6 p.m. peak hour, and incrementally decrease through the night and early morning hours.

Table 4.5-33, "Van Ness Avenue Tunnel Construction—Intersection LOS during Evening and Overnight Work Hours," summarizes the intersection LOS analysis reflecting the tunnel construction travel lane closures. This analysis utilizes existing traffic volumes, and does not account for additional construction truck traffic.

Table 4.5-32
Average Midweek Traffic Volumes on Van Ness Avenue[1]

Hour	Northbound	Southbound	Total	% of Peak Hour
5 p.m. to 6 p.m.	987	1,188	2,175	100%
6 p.m. to 7 p.m.	908	1,104	2,013	93%
7 p.m. to 8 p.m.[2]	852	1,016	1,868	86%
8 p.m. to 9 p.m.	708	853	1,561	72%
9 p.m. to 10 p.m.	576	751	1,327	61%
10 p.m. to 11 p.m.	542	707	1,249	57%
11 p.m. to midnight	419	530	949	44%
Midnight to 1 a.m.	291	352	643	30%
1 a.m. to 2 a.m.	213	273	486	22%
2 a.m. to 3 a.m.	188	221	409	19%
3 a.m. to 4 a.m.	122	128	250	11%
4 a.m. to 5 a.m.	120	108	228	10%

Notes:
1 Average midweek traffic volumes, September 2009.
2 Hour used in analysis.
Source: California Pacific Medical Center. 2009 (September 29). 2006 and 2009 Traffic Count Comparisons for Select Intersections and Weekday/Weekend Peak Hour for the California Pacific Medical Center (CPMC) Master Plan EIR. San Francisco, CA.
Prepared by Fehr & Peers, San Francisco, CA.

As shown in Table 4.5-33, when the southbound traffic flow on Van Ness Avenue is restricted to one travel lane, the intersection of Van Ness/Geary would operate at LOS E or LOS F between 7 p.m. and midnight. Between 7 and 8 p.m. the upstream intersection of Van Ness/Post would operate at LOS E, and between 8 p.m. and midnight it would operate at LOS C or better. Since traffic volumes are generally lower in the northbound direction than the southbound direction (see Table 4.5-32), impacts of northbound travel lane closures would be less than described for the southbound lane closures. When the northbound traffic flow on Van Ness Avenue is restricted to one travel lane, the intersection of Van/Ness Geary would operate at LOS F between 7 and 9 p.m. Between 7 and 8 p.m. the upstream intersection of Van Ness/O'Farrell would also operate at LOS F, and between 8 and 9 p.m. it would operate at LOS D. **The closure of lanes on Van Ness Avenue during tunnel construction would be considered a significant impact on the intersections of Van Ness/Geary, Van Ness/Post, and Van Ness/O'Farrell.**

Table 4.5-33
Van Ness Avenue Tunnel Construction—Intersection LOS during Evening and Overnight Work Hours[1]

Intersection	Analysis Hour									
	7 p.m.	8 p.m.	9 p.m.	10 p.m.	11 p.m.	Midnight	1 a.m.	2 a.m.	3 a.m.	4 a.m.
Northbound[2]										
Van Ness/Post	B	B	B	B	A	A	A	A	A	A
Van Ness/Geary	**F**	**F**	D	D	C	B	B	B	B	B
Van Ness/O'Farrell	**F**	D	C	B	B	B	B	B	B	B
Southbound[2]										
Van Ness /Bush	B	B	B	B	B	B	B	B	B	B
Van Ness/Sutter	B	B	B	B	B	A	A	A	A	A
Van Ness/Post	**E**	C	B	B	B	A	A	A	A	A
Van Ness/Geary	**F**	**F**	**F**	**F**	**E**	B	B	B	B	B

Notes:
1 LOS E or LOS F conditions are highlighted in **bold**.
2 Reflects closure of two lanes. Since construction would proceed consecutively across Van Ness Avenue, and only two travel lanes would be closed at any one time, impacts would occur in either the northbound or southbound direction.
Source: Data compiled by Fehr & Peers in 2010

In summary, tunnel excavation would cause intersections near the tunnel construction site to operate unacceptably for a brief period when traffic is generally lighter when compared to daytime hours. This impact would occur for approximately 10 months and is not expected to cause substantial shifts in traffic to adjacent streets. Gough Street and Franklin Street may experience increases in traffic as drivers find alternative routes through the construction zone; however, similar to Van Ness Avenue, traffic along those streets is generally lighter between 7 p.m. and 5 a.m. and any increases in traffic would be short-term. Once tunnel construction is completed, Van Ness Avenue operations would return to normal.

As noted above, construction of the pedestrian tunnel under Van Ness Avenue would require closure of the temporary walkways during the evening and overnight hours on Van Ness Avenue. Since tunnel construction would only affect one side of Van Ness Avenue at any given time, detour routes would need to be established to direct pedestrians to the opposite side of the street. **Closure of the Van Ness Avenue sidewalks during this time would be considered a significant impact on pedestrians.**

Conclusion

Because of the extent of construction activities and duration, construction-related impact on traffic, transit, and pedestrians would be considered significant. Implementation of Mitigation Measure MM-TR-55 below, which would require CPMC and construction contractor to prepare a Construction Transportation Management Plan would reduce some of the impacts, however **the proposed project's construction impact would remain significant and unavoidable**.

Mitigation Measure TR-55

CPMC shall develop and implement a Construction Transportation Management Plan (TMP) to anticipate and minimize impacts of various construction activities associated with the Proposed Project.

The Plan would disseminate appropriate information to contractors and affected agencies with respect to coordinating construction activities to minimize overall disruptions and ensure that overall circulation is maintained to the extent possible, with particular focus on ensuring pedestrian, transit, and bicycle connectivity. The program would supplement and expand, rather than modify or supersede, any manual, regulations, or provisions set forth by Caltrans, SFMTA, DPW, or other City departments and agencies.

Specifically, the plan should:

- Identify construction traffic management best practices in San Francisco, as well as others that, although not being implemented in the City, could provide valuable information for the project. Management practices include, but are not limited to
  - Identifying ways to reduce construction worker vehicle trips through transportation demand management programs and methods to manage construction work parking demands.
  - Identifying best practices for accommodating pedestrians, such as temporary pedestrian wayfinding signage or temporary walkways.
  - Identifying ways to accommodate transit stops located at sidewalks slated for closure during construction. This may include identifying locations for temporary bus stops, as well as signage directing riders to those temporary stops.
  - Identifying ways to consolidate truck delivery trips, including a plan to consolidate deliveries from a centralized construction material and equipment storage facility.
  - Identifying best practices for managing traffic flows on Van Ness Avenue during the nighttime hours for the period when tunnel construction would involve surface construction activities. This may include coordination with Caltrans on appropriate traffic management practices and lane closure procedures.
- Describe procedures required by different departments and/or agencies in the city for implementation of a Construction TMP, such as reviewing agencies, approval processes, and estimated timelines. For example,
  - CPMC shall coordinate temporary and permanent changes to the transportation network within the City of San Francisco, including traffic, street and parking changes and lane closures, with the SFMTA. Any permanent changes may require meeting with the SFMTA Board of Directors or one of its sub-Committees. This may require a public hearing. Temporary traffic and transportation

changes must be coordinated through the SFMTA's Interdepartmental Staff Committee on Traffic and Transportation (ISCOTT) and would require a public meeting. As part of this process, the Construction Plan may be reviewed by SFMTA's Transportation Advisory Committee (TASC) to resolve internal differences between different transportation modes.

- Caltrans Deputy Directive 60 (DD-60) requires TMP and contingency plans for all state highway activities. These plans should be part of the normal project development process and must be considered during the planning stage to allow for the proper cost, scope and scheduling of the TMP activities on Caltrans right-of-way. These plans should adhere to Caltrans standards and guidelines for stage construction, construction signage, traffic handling, lane and ramp closures and TMP documentation for all work within Caltrans right-of-way.

- Require consultation with other Agencies, including Muni/SFMTA and property owners on Cedar Street, to assist coordination of construction traffic management strategies as they relate to bus-only lanes and service delivery on Cedar Street. CPMC should proactively coordinate with these groups prior to developing their Plan to ensure the needs of the other users on the Islands addressed within the construction TMP for the project.

- Identify construction traffic management strategies and other elements for the project, and present a cohesive program of operational and demand management strategies designed to maintain acceptable levels of traffic flow during periods of construction activities. These include, but are not limited to, construction strategies, demand management activities, alternative route strategies, and public information strategies.

- Develop a public information plan to provide adjacent residents and businesses with regularly-updated information regarding project construction, including construction activities, peak construction vehicle activities (e.g., concrete pours), travel lane closures, and other lane closures.

The Construction Transportation Management Plan shall be submitted to SFMTA, SFDPW, and the Planning Department for review and approval.

Implementation of Mitigation Measure MM-TR-55 would help reduce the Project's contribution to construction-related traffic, transit, and pedestrian impacts; however, given the magnitude of the proposed project and the duration of the construction period, **the project's construction impact would remain significant and unavoidable**.

IMPACT TR-56 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would result in a significant transportation impact in the project vicinity resulting from construction vehicle traffic and construction activities. (Significant and Unavoidable with Mitigation)*

For the Two-Way Post Street Variant, transportation impacts associated with construction activities would be the same as under the proposed LRDP, as described in Impact TR-55. Because of the extent of construction activities and expected duration, construction-related impacts on traffic, transit, and pedestrians would be considered significant. Implementation of Mitigation Measure MM-TR-55 (a Construction Management Plan) would help reduce the project's contribution to construction-related traffic, transit, and pedestrian impacts; however, given the magnitude of the proposed project and the expected duration of the construction period, **the Two-Way Post Street Variant's construction impact would remain significant and unavoidable.**

IMPACT TR-57 *Implementation of the Cathedral Hill Campus project MOB Access Variant would result in a significant transportation impact in the project vicinity from construction vehicle traffic and construction activities. (Significant and Unavoidable with Mitigation)*

For the MOB Access Variant, transportation impacts associated with construction activities would be the same as under the proposed LRDP, as described in Impact TR-55. Because of the extent of construction activities and expected duration, construction-related impacts on traffic, transit, and pedestrians would be considered significant. Implementation of Mitigation Measure MM-TR-55 (a Construction Management Plan) would help reduce the project's contribution to construction-related traffic, transit, and pedestrian impacts; however, given the magnitude of the proposed project and the expected duration of the construction period, **the MOB Access Variant's construction impact would remain significant and unavoidable**.

IMPACT TR-58 *Implementation of the Cathedral Hill Campus project No Van Ness Avenue Pedestrian Tunnel Variant would result in a significant transportation impact in the project vicinity resulting from construction vehicle traffic and construction activities. (Significant and Unavoidable with Mitigation)*

For the No Van Ness Avenue Pedestrian Tunnel Variant, transportation impacts associated with construction activities would be similar to those under the proposed LRDP project. With the No Van Ness Avenue Pedestrian Tunnel Variant, construction impacts associated with the Van Ness Avenue Tunnel construction, as described in Impact TR-55, would not occur and, therefore, construction impacts would be less than under the proposed LRDP. However, because of the overall extent of construction activities and expected duration, construction-related impacts traffic, transit, and pedestrians would be considered significant. Implementation of Mitigation Measure MM-TR-55 (a Construction Management Plan) would help reduce the project's contribution to construction-related traffic, transit, and pedestrian impacts; however, given the magnitude of the proposed project and the expected duration of the construction period, **the proposed project's construction impact would remain significant and unavoidable**.

Parking Discussion

San Francisco does not consider parking supply as part of the permanent physical environment and, therefore, does not consider changes in parking conditions to be environmental impacts as defined by CEQA. The San Francisco Planning Department acknowledges, however, that parking conditions may be of interest to the public and the decision-makers. Therefore, a parking analysis and discussion for the proposed LRDP is presented for information purposes.

Parking conditions are not static, as parking supply and demand varies from day to day, from day to night, from month to month, etc. Hence, the availability of parking spaces (or lack thereof) is not a permanent physical condition, but changes over time as people change their modes and patterns of travel. Parking deficits are considered to be social effects, rather than impacts on the physical environment as defined by CEQA. Under CEQA, a project’s social impacts need not be treated as significant impacts on the environment. Environmental documents should, however, address the secondary physical impacts that could be triggered by a social impact (State CEQA Guidelines, Section 15131[a]). The social inconvenience of parking deficits, such as having to hunt for scarce parking spaces, is not an environmental impact, but there may be secondary physical environmental impacts, such as increased traffic congestion at intersections, air quality impacts, safety impacts, or noise impacts caused by congestion. In the experience of San Francisco transportation planners, however, the absence of a ready supply of parking spaces, combined with available alternatives to auto travel (e.g., transit service, taxis, bicycles or travel by foot) and a relatively dense pattern of urban development, induces many drivers to seek and find alternative parking facilities, shift to other modes of travel, or change their overall travel habits. Any such resulting shifts to transit service in particular, would be in keeping with the City’s “Transit-First” policy. The City’s Transit-First Policy, established in the City’s Charter Article 8A, Section 8A.115, provides that “parking policies for areas well served by public transit shall be designed to encourage travel by public transportation and alternative transportation.”

The transportation analysis accounts for potential secondary effects, such as cars circling and looking for a parking space in areas of limited parking supply, by assuming that all drivers would attempt to find parking at or near the project site and then seek parking farther away if convenient parking is unavailable. Moreover, the secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to others who are aware of constrained parking conditions in a given area. Hence, any secondary environmental impacts which may result from a shortfall in parking in the vicinity of the proposed project would be minor, and the traffic assignments used in the transportation analysis, as well as in the associated air quality, noise and pedestrian safety analyses, reasonably addresses potential secondary effects.

In summary, changes in parking conditions are considered to be social impacts rather than impacts on the physical environment. Accordingly, the following parking analysis is presented for informational purposes only.

With implementation of the CPMC LRDP, the Cathedral Hill Campus would provide a total of 1,227 parking spaces, including 513 spaces at the Cathedral Hill Hospital, 542 spaces at the Cathedral Hill MOB, and 172 spaces at the 1375 Sutter MOB. The proposed project would be required to meet Planning Code requirements for the number of spaces, as well as the number of handicapped-accessible parking spaces, bicycle parking spaces, and car share spaces.

Table 4.5-34, “Summary of Parking Supply and Demand by Campus” (page 4.5-164), presents a comparison of the proposed supply to the estimated parking demand by population, including physicians, employees, as well as patients and visitors. At buildout, there would be a peak parking demand of about 1,389 spaces, compared with a total supply of 1,227 spaces. As indicated in Table 4.5-34, there would be an overall parking shortfall of 162 spaces, including a parking shortfall of 212 spaces for employees and an overall surplus of 50 spaces for patients and visitors (which includes a parking shortfall at the proposed 1375 Sutter MOB). It is anticipated that short-term visitors to the 1375 Sutter MOB that are unable to find parking within the building would likely park at the Cathedral Hill MOB and walk to the 1375 Sutter MOB, or park in any available on-street parking space around the campus, although some visitors may also choose to take transit, bicycle, or walk instead of driving. Employees unable to park at the campus could take transit, bicycle or walk to the campus, or park off-site at the Japan Center Garage. Employees who chose to park at the Japan Center Garage may increase the demand for CPMC shuttle services.

Proposed sidewalk widening and other pedestrian improvements would result in the displacement of 26 standard metered spaces, one handicapped-accessible space, and ten commercial vehicle loading/unloading spaces.

- On Franklin Street between Post Street and Geary Boulevard, the new loading dock driveways and the Emergency Department drop-off would result in the displacement of four metered parking spaces and one handicapped-accessible space.

  On Post Street between Franklin Street and Van Ness Avenue, the proposed sidewalk widening would result in the displacement of five metered parking spaces, five metered commercial vehicle loading/unloading spaces, and a passenger loading zone. On the eastern portion of the block, a shuttle stop recessed into the sidewalk would be provided, which would also accommodate one of the five displaced commercial vehicle loading/unloading spaces.

- On the west side of Van Ness Avenue between Post Street and Geary Boulevard, the proposed sidewalk widening would displace three metered parking spaces. The existing driveways into the Cathedral Hill Hotel garage would be eliminated, and there would not be any curb cuts adjacent to the project site on the west side of Van Ness Avenue.

Table 4.5-34
Summary of Parking Supply and Demand by Campus

	Parking Supply				Parking Demand				Supply less Demand			
	Physicians	Employees	Visitors/ Patients	Total	Physicians	Employees	Visitors/ Patients	Total	Physicians	Employee s	Visitors/ Patients	Total
Cathedral Hill Campus												
Hospital	107	161	245	513	107	415	242	764	0	-254	3	-251
MOB	114	113	315	542	114	107	244	465	0	6	71	77
1375 Sutter	39	73	60	172	39	37	84	160	0	36	-24	12
Total	**260**	**347**	**620**	**1,227**	**260**	**559**	**570**	**1,389**	**0**	**-212**	**50**	**-162**
Pacific Campus	260	721	606	1,587	260	708	609	1,577	0	10	0	10
Davies Campus	105	307	218	630	105	478	250	833	0	-171	-32	-203
St. Luke's Campus	98	165	187	450	98	337	324	759	0	-172	-137	-309
Off-Campus 1	0	623	0	623	0	0	0	0	0	623	0	623
Total LRDP	***739***	***2,163***	***1,612***	***4,514***	***723***	***2,082***	***1,753***	***4,558***	***0***	***78***	***-119***	***-41***

Note:
[1] Off-campus parking supply of 623 spaces includes 400 spaces at the Japan Center Garage, 180 spaces at 855 Geary Street Garage, and 43 spaces at garage within 2015 Steiner Street.

Source: Data compiled by CHS Consulting Group and Fehr & Peers in 2010

- On the east side of Van Ness Avenue between Cedar Street and Geary Street, the proposed passenger loading/unloading zone would displace two metered commercial vehicle loading/unloading spaces.
- On Cedar Street between Van Ness Avenue and Polk Street, the proposed passenger loading/unloading zone, two-way operations, and driveways into the project site would displace ten metered parking spaces.
- On Geary Boulevard between Franklin Street and Van Ness Avenue, the proposed sidewalk widening would displace six on-street parking spaces and two commercial vehicle loading/unloading spaces. A driveway into the Cathedral Hill Hospital drive-through would be provided to the west of the sidewalk widening.
- On Geary Street between Van Ness Avenue and Polk Street, the new MOB garage entrance would require the relocation of the existing midblock bus stop and would displace one metered parking space and one commercial vehicle loading/unloading space.
- On the east side of Polk Street immediately north of Cedar Street, improvements to enhance driver sight distance would displace one metered parking space.

All of the on-street parking and commercial vehicle loading/unloading spaces that would be displaced are metered, with the exception of two commercial vehicle spaces on Geary Boulevard and one handicapped-accessible parking space on Franklin Street. The occupancy of the existing on-street parking spaces adjacent to the project sites varies throughout the day, and ranges between 57 percent in the mid-afternoon to about 77 percent at 8 p.m. The parking demand associated with the permanent displacement of about 36 parking spaces would be accommodated on other streets in the study area, and would result in increased parking occupancies. Some residents and visitors to the area would have to walk further between their parking space and destination, or switch to transit or other modes.

As presented above, improvements associated with the proposed Cathedral Hill Campus project would displace on-street commercial vehicle loading/unloading spaces directly adjacent to project sites on Post Street (four spaces), Van Ness Avenue (two spaces), Geary Boulevard between Franklin Street and Van Ness Avenue (two spaces), and Geary Street between Van Ness Avenue and Polk Street (one space), for a total of nine spaces. These on-street spaces generally serve uses on the project blocks that would be displaced with the project. Loading demand associated with the proposed Cathedral Hill Campus uses would be accommodated on-site, within off-street loading facilities, and at existing commercial vehicle loading/unloading spaces on Sutter Street. As described in Impact TR-43, any shortfall in loading supply would be managed through scheduling of deliveries.

With the Two-Way Post Street Variant, the number and location of parking spaces to be displaced would be the same as under the proposed LRDP. With the MOB Access Variant, the number and location of parking spaces to be displaced would be the same as under the proposed LRDP, except on Cedar Street, where four metered on-street parking spaces would be maintained.

As noted above, in San Francisco, parking supply is not considered a permanent physical condition, and changes in the parking supply would not be a significant environmental impact under CEQA, but rather a social effect. The loss of parking may cause potential social effects, which would include cars circling and looking for a parking space in neighboring streets. The secondary effect of drivers searching for parking is typically offset by a reduction in vehicle trips due to some drivers, who are aware of the constrained parking conditions in a given area, shifting to other modes.

◆ Pacific Campus

PROPOSED PROJECT AT PACIFIC CAMPUS

After completion of the proposed Cathedral Hill Hospital, all of the inpatient acute-care and Emergency Department functions at the Pacific Campus's existing 2333 Buchanan Street Hospital would be decommissioned and transferred to the Cathedral Hill Hospital (Table 2-2, "CPMC Existing and Proposed LRDP Licensed Hospital Bed Uses," page 2-10). This transfer of services would permit the interior renovation and conversion of the existing 2333 Buchanan Street Hospital into the Ambulatory Care Center (ACC).

The Stanford Building and the 2324 Sacramento Clinic would be demolished to accommodate the proposed Webster Street/Sacramento Street Underground Parking Garage and ACC Addition by 2020 (Figure 2-40, "Pacific Campus—Proposed Site Plan," page 2-123). A total of 715 new structured and surface parking spaces (Webster Street/Sacramento Street Underground Parking Garage and North-of-Clay Aboveground Parking Garage combined, 688 spaces; Buchanan Street surface parking lot, 27 spaces)[35] would be provided by the year 2020. This would bring the parking total at the Pacific Campus to 1,587 spaces by 2020, 648 parking more spaces than existing conditions.

PACIFIC CAMPUS PROPOSED SITE ACCESS

Several new or relocated access points are proposed for the Pacific Campus's existing and new buildings and parking garages via California, Buchanan, Sacramento, Webster, and Clay Streets (Figure 2-40, page 2-123). The main pedestrian entry to both the proposed ACC and the proposed ACC Addition would be located at the north end of the proposed Campus Drive near Clay Street. The main entry to the former 2333 Buchanan Street Hospital would be converted into a secondary entrance to the ACC.

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[35] The existing Clay Street/Webster Street Parking Garage and the other surface parking spaces that would be retained at 2300 California Street (41 spaces) would not change.

Vehicular traffic serving the ACC and ACC Addition would be routed onto Clay Street east of Webster Street. The entry/exit for the North-of-Clay Aboveground Parking Garage and for the Webster Street/Sacramento Street Underground Parking Garage would be located on Clay Street and Campus Drive, respectively. Other passenger drop-off areas would be located on Webster Street south of Clay Street near the Pacific Professional Building, and on Buchanan Street near the north end of the ACC building (Figure 2-40, page 2-123). The ambulance entrance would remain on the north side of Sacramento Street (at the south end of the ACC building) near Buchanan Street. Four off-street loading docks would be located on Campus Drive near the loading entrance/exit on Sacramento Street.

The Pacific Campus would continue to operate as the hub of the existing CPMC intercampus shuttle system in the near term until the acute-care and Emergency Department functions at the Pacific Campus are transferred to the proposed Cathedral Hill Campus (i.e., the end of 2014). The CPMC shuttle stop, currently located on Buchanan Street, would be relocated to the drop-off area located within the proposed North-of-Clay Aboveground Parking Garage (Figure 2-40, page 2-123), which would be closer to the new main entry at the new Campus Drive near Clay Street.

The impacts associated with implementation of the Pacific Campus component of the CPMC LRDP are evaluated assuming a program level analysis. When the Pacific Campus final design is completed, project level analysis would be performed to determine if final design changes revise any assumptions used in the impact analysis.

Implementation of the Pacific Campus project would include the following changes to the street network:

- A new CPMC shuttle stop would be provided on Sacramento Street near the proposed Campus Drive (approximately midblock between Webster Street and Buchanan Street). This shuttle stop would require the removal of about three on-street parking spaces on Sacramento Street.

- The new Campus Drive would require a new driveway onto Sacramento Street, which would require the removal of three on-street parking spaces.

- A new curb cut would be provided on Buchanan Street for the new North of Clay parking garage, which would require the removal of three on-street parking spaces.

Impacts associated with the project proposed at Pacific Campus are presented below. The following are the topics addressed and the impacts analyzed for those topics:

- *Traffic:* Impact TR-59
- *Transit:* Impact TR-60
- *Bicycle:* Impact TR-61

- *Pedestrian:* Impact TR-62
- *Loading:* Impacts TR-63 and TR-64
- *Emergency vehicle access:* Impact TR-65
- *Construction:* Impact TR-66

IMPACT TR-59 *Implementation of the Pacific Campus project would not cause an increase in traffic at the study intersections that would cause the LOS to deteriorate from LOS D or better to LOS E or LOS F, or from LOS E to LOS F. (Less than Significant)*

The Pacific Campus project would result in a net increase of 71 vehicle trips during the p.m. peak hour (12 net-new inbound and 59 net-new outbound trips). Table 4.5-35, "Levels of Service at Pacific Campus Study Intersections—P.M. Peak-Hour Conditions" (page 4.5-169) summarizes the intersection LOS conditions for 2020 Modified Baseline No Project and Modified Baseline plus Project conditions. With the addition of the new vehicle trips, the 16 study intersections would continue to operate at acceptable levels of service and, therefore, the Pacific Campus project would result in a less-than-significant impacts during the 2020 Modified Baseline plus Project conditions. Figure 4.5-23, "2020 Modified Baseline plus Project Conditions—Intersection Level of Service, P.M. Peak Hour" (page 4.5-122), presents the LOS conditions at the study intersections for 2020 Modified Baseline plus Project conditions for the p.m. peak hour. Since all Pacific Campus study intersections would continue to operate at acceptable levels of LOS D or better, **the Pacific Campus project traffic impact would be less than significant**.

IMPACT TR-60 *Implementation of the Pacific Campus project would not cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity, resulting in unacceptable levels of transit service. (Less than Significant)*

The Pacific Campus project would generate 37 net-new transit trips, as shown in Table 4.5-11 (page 4.5-77), 1 inbound and 36 outbound). Transit trips to and from the Pacific Campus would utilize nearby Muni bus lines, and may include transfers to other Muni bus and light rail lines, or other regional transit providers.

Table 4.5-36, "Muni Corridor Analysis—Pacific and Davies Campuses—P.M. Peak-Hour Conditions" (page 4.5-172), summarizes the corridor capacity utilization analysis for the routes serving the Pacific Campus vicinity. The additional transit demand could be accommodated during the p.m. peak hour, and all four corridors would continue to operate at less than Muni's 85 percent capacity utilization standards. Therefore, **Pacific Campus project impact on transit capacity at the study area corridors would be less than significant**.

Table 4.5-35
Levels of Service at Pacific Campus Study Intersections—P.M. Peak-Hour Conditions

	Existing		Modified Baseline 2020				Cumulative			
			2020 No Project		2020 Project		2030 No Project		2030 Project	
	Delay [1,2]	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
26. Octavia/Market	38.7	D	50.9	D	51.8	D	**>80/1.02**	**F**	**>80/1.02**	**F**
28. Fillmore/California	16.8	B	17.4	B	17.4	B	17.7	B	17.7	B
29. Fillmore/Sacramento	17.2	B	19.4	B	20.2	C	27.0	C	29.5	C
30. Fillmore/Clay	10.6(nb)	B	11.1(nb)	B	11.1(nb)	B	11.5(nb)	B	11.5(nb)	B
31. Fillmore/Washington	9.0(sb)	A	9.2(sb)	A	9.3(sb)	A	9.4(sb)	A	9.5(sb)	A
32. Webster/California	20.2	C	20.3	C	20.9	C	20.3	C	20.8	C
33. Webster/Sacramento	14.6(sb)	B	18.8(sb)	C	19.8(sb)	C	26.8(sb)	D	29.1(sb)	D
34. Webster/Clay	10.8(nb)	A	11.2(nb)	B	11.4(nb)	B	11.5(nb)	B	11.7(nb)	B
35. Webster/Washington	8.5(nb/sb)	A	8.9(nb/sb)	A	9.0(nb/sb)	A	9.3(nb/sb)	A	9.4(nb)	A
36. Buchanan/California	11.2	B	11.2	B	11.2	B	11.2	B	11.3	B
37. Buchanan/Sacramento	10.1(sb)	A	10.8(sb)	B	11.1(sb)	B	11.7(sb)	B	12.1(sb)	B
38. Buchanan/Clay	8.5(sb)	A	8.6(sb)	A	8.7(sb)	A	8.6(sb)	A	8.7(sb)	A
39. Buchanan/Washington	8.7(sb)	A	9.0(sb)	A	9.0 (sb)	A	9.1 (sb)	A	9.1(sb)	A
40. Laguna/California	14.6	B	14.7	B	14.7	B	14.6	B	14.6	B
41. Laguna/Sacramento	11.5(sb)	B	12.8(sb)	B	13.1(sb)	B	14.8(wb)	B	15.4 (wb)	C
42. Laguna/Washington	10.1(sb)	A	10.5(sb)	A	10.6(sb)	A	10.8(sb)	A	10.9(sb)	B

Notes:
1 Delay presented in seconds per vehicle. For unsignalized intersections, delay and LOS presented for worst approach. Worst approach indicated in ( ).
2 Intersections operating at LOS E or LOS F conditions highlighted in bold, and overall intersection volume-to-capacity (v/c) ratio is presented for intersections operating at LOS F.
Source: Data compiled by Fehr & Peers in 2010

Source: Data compiled by Fehr & Peers in 2010

2020 Modified Baseline plus Project Conditions—Intersection Level of Service, P.M. Peak Hour

Figure 4.5-23

The existing passenger loading/unloading zone on Webster Street near the intersection of Clay Street, and on Buchanan Street near Clay Street, would provide adequate room for the CPMC shuttle vehicles to maneuver and stop at the curb for loading and unloading of passengers. In addition, a new shuttle stop would be provided on Sacramento Street near the proposed Campus Drive. The scheduled headway for the shuttles is estimated to be approximately 5 minutes between shuttles, with each shuttle dwelling for no longer than 1 minute, and it would not be likely for more than one shuttle to be loading at the same time. Since the Clay Street and Buchanan Street shuttle stops would not be on streets with Muni bus routes, shuttle stop activities would not conflict with Muni operations. On Sacramento Street, the new shuttle stop would be at the curb and would be within a dedicated shuttle zone not used for passenger loading/unloading activities. Therefore, **impact of shuttle service on nearby transit lines would be less than significant**.

IMPACT TR-61 *Implementation of the Pacific Campus project would not create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the project site and adjoining areas. (Less than Significant)*

The Planning Code requires that the Pacific Campus project provide bicycle parking as well as showers and locker facilities. It is anticipated that the proposed project at Pacific Campus would meet the Planning Code requirements which would result in an increase over existing conditions in the number of bicycle parking spaces.

During the p.m. peak hour, a portion of the 20 “other” trips identified in Table 4.5-11 (page 4.5-77) would be expected to be made by bicycle, including on the nearby Route 10 on Webster and Clay Streets and Route 45 on Steiner Street. Although the Pacific Campus project would result in an increase in the number of vehicles and bicyclists in the vicinity of the project site, these new trips would be incremental and would not affect bicycle travel in the area and, therefore, **the project’s impact on bicyclists would be less than significant**.

IMPACT TR-62 *Implementation of the Pacific Campus project would not result in substantial overcrowding on public sidewalks, create hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the project site or adjoining areas. (Less than Significant)*

The Pacific Campus project would result in an increase in pedestrian activity in the vicinity of the campus, including walk trips to and from the new uses, plus walk trips to and from Muni bus stops. Overall, during the p.m. peak hour, the Pacific Campus project would add about 64 net-new pedestrian trips (an increase of 27 walk trips, and 37 net-new trips that account for walk trips to and from the Muni bus stops) to the surrounding streets during the p.m. peak hour, as shown in Table 4.5-11 (page 4.5-77).

Table 4.5-36
Muni Corridor Analysis—Pacific and Davies Campuses—P.M. Peak-Hour Conditions

	Existing		Modified Baseline 2020 No Project		Modified Baseline 2020 Project		Cumulative 2030 No Project		Cumulative 2030 Project	
	Passengers	Capacity Utilization	Passengers	Capacity Utilization	Passengers	Capacity Utilization	Passengers	Capacity Utilization	Passengers	Capacity Utilization
Pacific Campus										
Northbound	472	49%	514	45%	542	48%	549	48%	577	51%
Southbound	550	57%	550	49%	586	52%	550	49%	586	52%
Eastbound	1,964	55%	2,417	66%	2,490	68%	2,764	76%	2,837	78%
Westbound	2,751	77%	2,871	79%	2,924	80%	2,969	81%	3,022	83%
Davies Campus										
Northbound	812	42%	908	39%	934	40%	988	43%	1,014	44%
Southbound	1,421	74%	1,421	61%	1,452	62%	1,421	61%	1,452	62%
Eastbound	3,122	34%	3,543	35%	3,609	36%	3,839	38%	3,905	39%
Westbound	7,380	81%	7,750	77%	7,765	77%	8,073	80%	8,088	80%

Notes:
Capacity utilization calculations reflect capacity changes associated with the TEP project. Service changes resulting in capacity increases are proposed for the 5-Fulton, 12-Folsom-Pacific, 19-Polk, 21-Hayes, 22-Fillmore, 24-Divisadero, 27-Bryant, 31-Balboa, 38L-Geary Limited, 44-O'Shaughnessy, 47-Van Ness, 49-Van Ness-Mission, F-Market & Wharves, J-Church, L-Taraval, and N-Judah.
Service changes resulting in decreases in capacity are proposed to occur on the 1BX-California Express, 2-Clement, 16AX/BX-Noriega Expresses, 38BX-Geary Express, 48-Quintara-24th Street, and M-Ocean View
Source: Data compiled by Fehr & Peers in 2010

The new pedestrian trips generated by the Pacific Campus project could be accommodated on nearby sidewalks without significantly affecting pedestrian conditions. A new pedestrian access to the main entrance of the ACC would be provided on the new Campus Drive entrance. Existing pedestrian conditions on sidewalks and crosswalks were observed to be acceptable, with adequate space to accommodate additional pedestrians. The net-new pedestrian trips would not result in substantial overcrowding on the sidewalks or hazardous conditions. Therefore, **the Pacific Campus project's impact on pedestrian conditions would be less than significant**.

IMPACT TR-63 *Implementation of the Pacific Campus project would not result in a loading demand during the peak hours of loading activities that could not be accommodated within the proposed loading supply or within on-street loading zones, and would not create potentially hazardous conditions. (Less than Significant)*

At buildout of the Pacific Campus, a total of four on-site loading spaces would be provided within a designated loading area off of the new Campus Drive south of the Main ACC entrance. Two of the four spaces would accommodate large trucks. In addition, similar to existing conditions, it is anticipated that loading/unloading activities by small trucks and vans would occur on the portion of the Clay Street alley internal to the project site (two spaces) and on-street on Webster Street at the yellow commercial vehicle loading/unloading zone (three spaces). At this time it is not known if loading/unloading activities would be permitted along Campus Drive. In total, there would be nine on-site and on-street loading spaces available for Pacific Campus loading/unloading activities, including two large truck loading spaces.

Trucks accessing the loading dock area would enter from either Clay Street and turn onto Campus Drive or access Campus Drive directly from Sacramento Street, and would back into the loading dock space from Campus Drive. Campus Drive is currently designed to be 24-feet wide and thus, a 35-foot long truck would have sufficient turning radius to back into a large truck loading space, provided it can use both lanes of Campus Drive. This maneuver would briefly interrupt traffic flow on Campus Drive. However, it is not likely that stopped traffic on Campus Drive would impact circulation on-site or on Sacramento Street. Larger trucks (e.g., 50 feet in length), would not be accommodated within the loading dock, and instead would be accommodated off-street along the Clay Street stub or Campus Drive. The number of larger truck deliveries (primarily linens) at the Pacific Campus would decrease as part of the project because these deliveries would be redirected to the proposed Cathedral Hill Campus.

As indicated in Table 4.5-27 (page 4.5-137), the proposed project would generate a demand for nine service vehicle and truck loading/unloading spaces during the peak hour of loading activities. With implementation of the truck management plan that would be proposed as part of the CPMC LRDP, large trucks would no longer load/unload at the Pacific Campus. Since there would be a total of nine on-site and off-street loading/unloading spaces, the peak loading demand would be accommodated, and **loading impacts would be less than significant**.

While the loading impact would be less than significant, implementation of Improvement Measures I-TR-63.1 and I-TR-63.2 below would further reduce the less-than-significant loading/unloading impact and the potential for vehicles to double-park on Webster Street by requiring an additional on-site loading space. Implementation of Improvement Measure I-TR-63.2 would further reduce the less-than-significant loading impact by ensuring that an attendant would be on duty between 7 a.m. and 5 p.m. to manage the Clay Street alley and Campus Drive loading spaces.

Improvement Measure I-TR-63.1 Provide Additional On-site Loading Spaces

CPMC shall design Campus Drive between 2100 Webster Street and the ACC Addition to provide for at least one 8-foot-wide loading lane, to provide for one additional on-site loading space. Although detailed plans are not available at this time, and the Pacific Campus project would be a long term project under the CPMC LRDP, the preliminary proposed width of 24 feet of Campus Drive (too narrow to accommodate two travel lanes and a loading lane) could be widened as part of further design efforts. The clearance width between the 2100 Webster Building and the ACC Annex is approximately 48 feet, which could potentially allow for an 8-foot-wide loading lane, 10-foot-wide sidewalk, 6-foot-wide landscaping and planting area, in addition to two 12-foot wide travel lanes.

Improvement Measure I-TR-63.2 Provide Loading Attendant

CPMC shall provide for an attendant to manage the Clay Street alley and the Campus Drive loading areas between 7 a.m. and 5 p.m. to direct arriving trucks to available spaces and monitor loading/unloading activities and duration to ensure turnover.

IMPACT TR-64 *Implementation of the Pacific Campus project would not result in a passenger loading/unloading demand that could not be accommodated within the existing and proposed passenger loading/unloading zones, and would not create potentially hazardous conditions. (Less than Significant)*

The Pacific Campus project would provide about a 150 feet passenger loading/unloading zone in the proposed North-of-Clay Garage that would be built as part of the demolition and construction of buildings in the area. In addition, six on-street parking spaces currently located on Buchanan Street would be converted to a time-limited (e.g., between 8 a.m. and 6 p.m.) curb-side passenger loading and unloading zone. These zones would be in addition to the 350 feet of existing passenger loading/unloading zones on Buchanan, Sacramento, and Webster Streets. The additional loading/unloading zone was incorporated into the project design to minimize the incidence of double-parking and blocking of crosswalks that currently occur at the Webster Street passenger loading/unloading zone.

As indicated in Table 4.5-28 (page 4.5-144), the projected peak demand for about 625 feet of passenger loading/unloading activity would be generally accommodated within the proposed supply. Therefore, **the Pacific Campus project impact related to passenger loading/unloading activity would be less than significant**.

IMPACT TR-65 *Implementation of the Pacific Campus project would not result in a significant emergency vehicle access impact. (Less than Significant)*

With implementation of the LRDP, the 2333 Buchanan Street Hospital functions would be relocated to the new Cathedral Hill Campus and the Pacific Campus would no longer serve emergency ambulance vehicles at the campus. The existing ambulance/emergency room loading area on Sacramento Street west of Buchanan Street would be repurposed to serve as patient and visitor loading. This area would also be available to emergency vehicles (fire, police, ambulances, etc.) in the event of an emergency, as would the passenger loading/unloading zones on Buchanan Street, Webster Street, Clay Street alley, and Campus Drive and, therefore, emergency vehicle access to the Pacific Campus would be retained. Therefore, **the impact related to emergency vehicle access would be less than significant**.

IMPACT TR-66 *Implementation of Pacific Campus project construction-related activities would not cause an impact that would be considered significant because of their temporary and limited duration. (Less than Significant)*

The Pacific Campus project would be constructed over multiple years between approximately 2015 and 2019, starting with the conversion of the 2333 Buchanan Street Hospital to ACC space between 2015 and 2016. At completion of the 2333 Buchanan Street ACC, the uses within 2351 Clay Street, 2340-2360 Clay Street, 2324 Sacramento Street and 2200 Webster Street would be relocated to the new building, and these buildings, as well as the Clay Street tunnel, would be demolished in 2017. Construction of the ACC Addition, parking facilities, and other projects would begin after 2016, and are anticipated to be completed by 2020.

A more detailed construction plan for the proposed project components including staging areas, worker parking, and temporary closures would be developed for project-level environmental review. Generally, construction of the project would be staged on the Pacific Campus as much as possible. After the Buchanan Street Hospital and other medical office and treatment uses in the Pacific Campus fully transfer to the proposed Cathedral Hill Campus, the buildings to be renovated, demolished, or modified would be fully vacated. This would allow construction staging and construction worker parking to occupy existing parking lots and loading areas in the Pacific Campus.

Much of the proposed demolition and construction would affect buildings located on both sides of the Clay Street alley within the Pacific Campus. The Clay Street alley would likely be closed during construction for the exclusive use of construction loading activities. The conversion of the Buchanan Street Hospital to ACC space would be primarily interior and would require little staging of heavy vehicles around the perimeter. The 2200 Webster Street building and the 2324 Sacramento Street buildings are the only buildings to be demolished that front on streets external to the Pacific Campus. Up to 24 on-street parking spaces would likely be temporarily displaced on Sacramento Street and Webster Street for the duration of construction to accommodate construction staging and activities. A portion or all of the sidewalks along these streets could similarly be closed, and pedestrian circulation would be limited to a portion of the sidewalk, rerouted to temporary walkways within the parking lane, or detoured to the other side of the street.

The poles supporting the overhead wire system for the 1-California bus line on Sacramento Street would need to be maintained. No overhead wires are currently attached to the existing Pacific Campus building, but rather are attached to poles that are located on the sidewalk and would not likely be impacted by the project construction.

It is not anticipated that any travel lane closures would be required; however, any street closures, parking restrictions, bus stop relocations, and/or temporary sidewalk closures necessary for construction activities would be reviewed and coordinated with SFMTA. The City's Traffic Advisory Staff Committee (TASC) reviews project traffic control plans, including proposed lane and sidewalk closures, prior to the project receiving a building permit. TASC, which consists of representatives from the Fire Department, Police Department, SFMTA Traffic Engineering Division, and the Department of Public Works, provides recommendations on construction projects that would impact the public right-of-way. Overall, the proposed Pacific Campus project construction would not substantially affect traffic, transit, pedestrian, or bicycle circulation, and any potential impacts would not be considered significant due to their temporary and limited duration. Therefore, **the construction impact associated with the Pacific Campus project would be less than significant**.

Parking Discussion

San Francisco does not consider parking supply as part of the permanent physical environment and, therefore, does not consider changes in parking conditions to be environmental impacts as defined by CEQA. The San Francisco Planning Department acknowledges, however, that parking conditions may be of interest to the public and the decision-makers. Therefore, a parking analysis and discussion for the proposed LRDP is presented for information purposes.

Parking conditions are not static because parking supply and demand vary from day to day, from day to night, and from month to month. The availability or lack of parking spaces is not a permanent physical condition but changes over time whenever people change their modes and patterns of travel. Parking deficits are considered to be social effects, rather than impacts on the physical environment as defined by CEQA. Under CEQA, a project's social impacts need not be treated as significant impacts on the environment. Environmental documents should, however, address the secondary physical impacts that could be triggered by a social impact (State CEQA Guidelines, Section 15131[a]).

The social inconvenience of parking deficits, such as having to hunt for scarce parking spaces, is not an environmental impact, but there may be secondary physical environmental impacts, such as increased traffic congestion at intersections, air quality impacts, safety impacts, or noise impacts caused by congestion. In the experience of San Francisco transportation planners, however, the absence of a ready supply of parking spaces, combined with available alternatives to auto travel (e.g., transit service, taxis, bicycles, or travel by foot) and a relatively dense pattern of urban development, induces many drivers to seek and find alternative parking facilities, shift to other modes of travel, or change their overall travel habits. Any such resulting shifts to transit service, in particular, would be in keeping with the City's Transit-First Policy (Charter Article 8A, Section 8A.115). This policy provides that: "parking policies for areas well served by public transit shall be designed to encourage travel by public transportation and alternative transportation."

The transportation analysis accounted for potential secondary effects, such as cars circling and looking for a parking space in areas of limited parking supply, assuming that all drivers would attempt to find parking at or near the project site and then seek parking farther away if more convenient parking was unavailable. Moreover, the analysis took into account that the secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to others who are aware of constrained parking conditions in a given area. Any secondary environmental impacts that might result from a shortfall in parking in the vicinity of the proposed project would be minor, and the traffic assignments used in the transportation analysis, as well as in the associated air quality, noise, and pedestrian safety analyses, reasonably addresses potential secondary effects.

In summary, changes in parking conditions are considered to be social impacts rather than impacts on the physical environment. Accordingly, the following parking analysis is presented for informational purposes only.

The Pacific Campus currently contains 939 off-street parking spaces, 847 in structured parking and 92 in surface lots. With implementation of the CPMC LRDP, approximately 811 spaces in the existing 2100 Webster Street and 2405 Clay Street garages would be retained, and a new parking structure north of Clay Street and an underground facility at Webster Street and Sacramento Street would be constructed. At buildout of the Pacific Campus, a total of 1,587 parking spaces would be provided, including about 1,510 spaces in structured parking and 77 spaces in surface lots. The project would be required to meet Planning Code requirements for the number of parking spaces, as well as the number of handicapped-accessible parking spaces, bicycle parking spaces, and car share spaces.

Construction of the new Campus Drive and the new entrance to the North-of-Clay Garage would result in a loss of up to six on-street parking spaces.

Table 4.5-34 (page 4.5-164) presents a comparison of the proposed supply to the estimated parking demand. At buildout, there would be a peak parking demand of about 1,577 spaces, compared with a total supply of 1,587 spaces. Overall, the Pacific Campus would have a small parking surplus of 10 spaces.

◆ California Campus

Implementation of the CPMC LRDP would create a new medical campus and hospital at Cathedral Hill and modify, upgrade and alter care provided at the Pacific, Davies and St. Luke's Campuses. The existing Women's and Children's service at the California Campus would be transferred to the Cathedral Hill Campus, and only a limited amount of ancillary services would remain at the California Campus.

PROJECT AT CALIFORNIA CAMPUS

As part of the CPMC LRDP, the facilities and operation of the California Campus would remain unchanged until 2015, when the majority of existing activities would be relocated to the Pacific Campus (medical offices and outpatient care) and the proposed Cathedral Hill Campus (hospital uses and inpatient care). By 2020, the remaining CPMC services at the California Campus would consist of outpatient imaging and the lab draw site that support the medical office building at 3838 California Street. These two remaining CPMC services would continue indefinitely. Once the California Campus is sold and the majority of services are transferred to the new Cathedral Hill and the Pacific Campuses, the California Campus would no longer be considered part of CPMC. Analysis of any potential reuse or future redevelopment of the site would be speculative. Any future proposals at the site would require a project specific, project-level environmental review.

With no planned changes in facilities or operations, transportation travel demand at the California Campus would be expected to remain similar to existing conditions until 2015, and then gradually diminish between 2015 and 2020. All existing CPMC shuttles service, carpooling and car sharing programs and operations would gradually reduce and be terminated by 2020.

Impacts associated with the project proposed at the California Campus are presented below. The following are the topics addressed and the impacts analyzed for those topics:

- *Traffic:* Impact TR-67
- *Transit:* Impact TR-68
- *Bicycle:* Impact TR-69
- *Pedestrian:* Impact TR-70

- *Loading:* Impact TR-71
- *Emergency vehicle access:* Impact TR-72
- *Construction:* Impact TR-73

IMPACT TR-67 ***Implementation of the CPMC LRDP would not cause the level of service at California Campus study intersections to deteriorate from LOS D or better to LOS E or LOS F, or from LOS E to LOS F, and therefore, the project would not result in a significant traffic impact. (Less than Significant)***

Intersection LOS analysis was conducted for 2015 Modified Baseline No Project conditions for the weekday p.m. peak hour at 14 study intersections in the vicinity of the California Campus. The 2015 Modified Baseline No Project condition assumes that the planned growth at other CPMC Campuses occurs, and that the level of activity at the California Campus remains similar to full operations of the existing California Campus facilities. This is a conservative assessment, for as described above, under the proposed CPMC LRDP, the majority of services would be transferred to the proposed Cathedral Hill Campus and to the Pacific Campus, and activity at the California Campus is expected to consist only of limited outpatient imaging and lab services. It is also possible that the existing site may be purchased and may remain in use as medical and hospital space by another medical provider, and therefore, future travel demand with implementation of the CPMC LRDP at the California Campus may remain similar to existing demand. Future proposals or plans for the California Campus site would need to be assessed as part of a separate environmental review process.

Table 4.5-37, "Levels of Service at California Campus Study Intersections—P.M. Peak-Hour Conditions" (page 4.5-180), presents the results of the intersection LOS analysis for the 2015 Modified Baseline No Project conditions for the weekday p.m. peak hour. Figure 4.5-18 (page 4.5-97) presents the LOS conditions at the 14 study intersections. During the p.m. peak hour, the level of service at the 14 study intersections would not change substantially from existing conditions, and all intersections would continue to operate at acceptable levels of LOS D or better. Therefore, the traffic impact related to the California Campus would be less than significant.

Table 4.5-37
Levels of Service at California Campus Study Intersections—P.M. Peak-Hour Conditions

	Existing		2015 Modified Baseline No Project		2030 Cumulative No Project	
	Delay/v/c [1, 2]	LOS	Delay/v/c	LOS	Delay/v/c	LOS
43. Arguello/Sacramento	27.7	C	27.8	C	30.1	C
44. Arguello/California	28.8	C	30.3	C	36.8	D
45. Arguello/Geary	41.1	D	44.5	D	**72.8**	**E**
46. Palm/California	13.7(nb)	B	13.8(nb)	B	14.3(nb)	B
47. Cherry/Sacramento	9.5(wb)	A	9.3(wb)	A	10.1(wb)	A
48. Jordan/Cherry/California	26.0	C	28.4	C	45.1	D
49. Commonwealth/California	14.0(nb)	B	14.3(nb)	B	14.5(nb)	B
50. Parker/Maple/California	26.9	C	27.2	C	36.5	D
51. Maple/Sacramento	8.4(wb)	A	8.6(wb)	A	8.9(eb/wb)	A
52. Spruce/California	14.9	B	15.4	B	25.1	C
53. Spruce/Sacramento	9.1(nb)	B	9.4(nb)	A	10.4(nb)	B
54. Locust/California	10.3	B	10.4	B	11.1	B
55. Locust/Sacramento	8.4(wb)	A	9.0(wb)	A	9.6(wb)	A
26. Octavia/Market/U.S. 101	38.7	D	49.3	D	**>80/1.02**	**F**

Notes:
1 Delay presented in seconds per vehicle. For unsignalized intersections, delay and LOS presented for worst approach. Worst approach indicated in ( ).
2 Intersections operating at LOS E or LOS F conditions highlighted in **bold,** and overall intersection volume-to-capacity (v/c) ratio is presented for intersections operating at LOS F.
Source: Data compiled by Fehr & Peers in 2010

IMPACT TR-68 *Implementation of the CPMC LRDP relevant to the California Campus would not cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity, resulting in unacceptable levels of transit service. (Less than Significant)*

With implementation of the CPMC LRDP, transit ridership demand associated with the CPMC uses on the California Campus site would decrease. As a conservative assessment, the Muni transit corridor analysis for future year 2015 conditions was conducted assuming continued use of the California Campus, similar to existing conditions.

Table 4.5-36 (page 4.5-172) presents the Muni transit corridor analysis for p.m. peak-hour condition for the 2015 Modified Baseline No Project conditions. Under the 2015 Modified Baseline No Project conditions, the transit corridors would continue to operate at less than Muni's capacity utilization standard of 85 percent, and therefore, **the California Campus project's impact on transit service would be less than significant**.

IMPACT TR-69 *Implementation of the CPMC LRDP relevant to the California Campus would not create potentially hazardous conditions for bicyclists or otherwise substantially impact bicycle accessibility on the campus and adjoining areas. (Less than Significant)*

With implementation of the CPMC LRDP, the bicycle network and operating conditions in the vicinity of the California Campus would remain similar to existing conditions, and bicycle travel to and from the campus may decrease. The development would not substantially contribute to demand for bicycle use and facilities on the California Campus and vicinity, and therefore, **the California Campus impact on bicycle conditions would be less than significant**.

IMPACT TR-70 *Implementation of the CPMC LRDP relevant to the California Campus would not result in substantial overcrowding on public sidewalks, create hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the campus or adjoining areas. (Less than Significant)*

With implementation of the CPMC LRDP, the pedestrian network and operating conditions in the vicinity of the California Campus would remain similar to existing conditions, and pedestrian travel to and from the CPMC campus may decrease. The pedestrian operating conditions in the vicinity of the California Campus would remain acceptable, similar to existing conditions; therefore, **the impact on pedestrian conditions would be less than significant**.

IMPACT TR-71 *Implementation of the CPMC LRDP relevant to the California Campus would not result in a loading demand during the peak hours of loading activities that could not be accommodated within the proposed loading supply, or within on-street loading zones, and would not create potentially hazardous conditions. (Less than Significant)*

With implementation of the CPMC LRDP, the loading demand associated with existing uses at the California Campus would decrease. The California Campus project would not substantially contribute to off-street or on-street loading demand in the campus vicinity, and therefore **the impact on loading conditions on the California Campus would be less than significant**.

IMPACT TR-72 *Implementation of the CPMC LRDP relevant to the California Campus would not result in a significant emergency vehicle access impact. (Less than Significant)*

With implementation of the CPMC LRDP, the existing uses on the California Campus requiring emergency vehicle access would be relocated to the proposed Cathedral Hill Campus by 2015, and emergency vehicle trips to the California Campus would be reduced. The development would not affect emergency vehicle access in the campus area, nor contribute to increased demand for emergency services in the vicinity. Therefore, **the impact on emergency vehicle access at the California Campus would be less than significant**.

IMPACT TR-73 *Implementation of the CPMC LRDP relevant to the California Campus would not result in construction-related impacts. (Less than Significant)*

No construction activity is proposed for the California Campus under the CPMC LRDP. As part of the CPMC LRDP, the facilities and operation of the California Campus would remain unchanged until 2015, and at that point the existing activities would gradually be relocated to the Pacific Campus and the proposed Cathedral Hill Campus. By 2020, all uses at the California Campus, with the exception of the outpatient imaging and the lab draw site, would be relocated. Activity associated with relocation of uses would be temporary and occur incrementally over a 5-year period. Therefore, **construction impacts associated with the California Campus would be less than significant**.

Parking Discussion

With implementation of the CPMC LRDP, vehicle trips to and from the California Campus, and associated parking demand, may decrease. Implementation of the CPMC LRDP would not substantially change parking conditions in the California Campus vicinity.

◆ Davies Campus

PROPOSED PROJECT AT DAVIES CAMPUS

Under the CPMC LRDP, the Davies Campus would focus on neurosciences and the complementary areas of rehabilitation and skilled nursing. Existing uses in the North and South Towers would continue. The existing Emergency Department would remain in the North Tower, along with inpatient care, with the focus on neuroscience-related treatment, microsurgery, and postsurgery rehabilitation. The existing South Tower would continue to be used for skilled nursing, outpatient care, and diagnostic and treatment space. Under the near term, an approximately 50,100-sq.-ft. Neuroscience Institute building is proposed for construction on the portion of the

Davies Campus currently occupied by the 206-space surface parking lot at the corner of Noe Street and Duboce Avenue (Figure 2-45, "Davies Campus—Proposed Site Plan," page 2-155).

Under the long term project at Davies, the existing 290-space garage at 14th and Castro Streets would be demolished and a second MOB (the proposed Castro Street/14th Street MOB) would be constructed on the parking garage site by 2020 (Figure 2-45, page 2-155). The proposed approximately 264,900-sq.-ft., 45-foot-tall, three-story Castro Street/14th Street MOB would contain medical offices, building infrastructure, lobby space, and mechanical and electrical spaces, and would include four levels of parking totaling approximately 184,000 sq. ft. and providing 490 parking spaces.

DAVIES CAMPUS PROPOSED SITE ACCESS

Near-Term Projects

With construction of the Neuroscience Institute building in the near term, a new passenger drop-off area would be located on the service drive, under the connection to the North Tower. All existing site access, including vehicular access and parking and passenger drop-off areas, would not change with one exception. The existing northeast entrance to the surface parking lot near the corner of Noe Street and Duboce Avenue would be removed to accommodate construction of the Neuroscience Institute. Truck loading for the Neuroscience Institute would occur in the campus's existing loading area southwest of the proposed Neuroscience Institute building, accessible via the existing service drive from Duboce Avenue.

Site access to the Davies Hospital South Tower and the hospital's Emergency Department (located in the North Tower) would remain available from the main entrance off Castro Street and the parking entrance from Duboce Avenue (Figure 2-45, page 2-155).

Long-Term Projects

Vehicular access to the proposed Castro Street/14th Street MOB would be provided in the long term via the main entrance off Castro Street, via Duboce Avenue, and via the parking entrance on 14th Street. Pedestrian site access to this building would be from the entrance drive.

Implementation of the Davies Campus project would not require any changes to the existing sidewalks or on-street parking supply or regulations.

Impacts associated with the project proposed at Davies Campus are presented below. The following are the topics addressed and the impacts analyzed for those topics:

- *Traffic:* Impacts TR-74 through TR-76
- *Transit:* Impact TR-77
- *Bicycle:* Impact TR-78
- *Pedestrian:* Impact TR-79
- *Loading:* Impacts TR-80 and TR-81
- *Emergency vehicle access:* Impact TR-82
- *Construction:* Impact TR-83

IMPACT TR-74 *Implementation of the Davies Campus project would have a less-than-significant impact at five study intersections that would operate at LOS E or LOS F under 2020 Modified Baseline No Project conditions and 2020 Modified Baseline plus Project conditions. (Less than Significant)*

As shown in Table 4.5-11 (page 4.5-77), the Davies Campus project would result in a net increase of 202 vehicle trips during the p.m. peak hour (16 net-new inbound and 186 net-new outbound trips). Table 4.5-38, "Levels of Service at Davies Campus Study Intersections—P.M. Peak-Hour Conditions" (page 4.5-185), and Figure 4.5-23 (page 4.5-170) summarize the results of the analysis for the 13 study intersections. The analysis concluded that:

- The Davies Campus project would have less than significant contributions at five study intersections that would operate at LOS E or LOS F under 2020 Modified Baseline conditions and continue to operate at LOS E or LOS F under 2020 Modified Baseline plus Project conditions (Impact TR-74).

- The Davies Campus project would add significant contributions at one study intersection (Church/Market/14th Street) that would operate at LOS F under 2020 Modified Baseline conditions and continue to operate at LOS F under 2020 Modified Baseline plus Project conditions (Impact TR-75).

- The Davies Campus Project would have less-than-significant impacts at seven study intersections that would operate at LOS D or better under 2020 Modified Baseline plus Project conditions (Impact TR-76).

At the six study intersections that would operate at LOS F under Modified Baseline 2020 No Project conditions and continue to operate at LOS F under Modified Baseline 2020 plus Project conditions, the increase in vehicle trips from 2020 Modified Baseline No Project conditions were reviewed to determine whether the increase would contribute considerably to critical movements operating at LOS E or LOS F. At five of the six intersections that would continue to operate at LOS E or LOS F under Modified Baseline 2020 plus Project conditions, the increase in vehicle trips from 2020 No Project caused by the Project was determined to be less than significant:

Table 4.5-38
Levels of Service at Davies Campus Study Intersections—P.M. Peak-Hour Conditions

	Existing		Modified Baseline 2020				Cumulative			
			2020 No Project		2020 Project		2030 No Project		2030 Project	
	Delay/v/c [1, 2]	LOS	Delay/v/c	LOS	Delay/v/c	LOS	Delay/v/c	LOS	Delay/v/c	LOS
56. Divisadero/Haight	**72.9**	**E**	**>80/1.15**	**F**	**>80/1.18**	**F**	**>80/1.08**	**F**	**>80/1.10**	**F**
57. Castro/Duboce	**>80/0.87**	**F**	**>80/1.18**	**F**	**>80/1.25**	**F**	**>80/1.18**	**F**	**>80/1.24**	**F**
58. Castro/14th	45.7	D	**>80/1.09**	**F**	**>80/1.13**	**F**	**>80/1.09**	**F**	**>80/1.13**	**F**
59. Castro/Market/17th	**>80/>1.5**	**F**	**>80/>1.5**	**F**	**>80/>1.5**	**F**	**>80/>1.5**	**F**	**>80/>1.5**	**F**
60. Scott/Duboce	10.1(sb/eb)	B	11.2(eb)	B	11.8(eb)	B	11.3(eb)	B	11.9(eb)	B
61. Noe/Duboce	10.3(eb)	B	11.8(eb)	B	12.5(eb)	B	12.3(eb)	B	13.1(eb)	B
62. Noe/14th	12.9(sb)	B	15.2(sb)	B	18.2(sb)	C	15.7(sb)	C	18.8(sb)	C
63. Sanchez/Duboce	10.3(nb/sb)	B	11.3(sb)	B	11.4(sb)	B	11.4(nb/sb)	B	11.5(nb/sb)	B
64. Fillmore/Duboce	8.8(sb)	A	8.8(sb)	A	8.8(sb)	A	8.8(sb)	A	8.8(sb)	A
65. Church/Duboce	12.6(sb)	B	16.0(nb)	C	16.0(nb)	C	16.2(nb)	B	16.2(nb)	B
66. Church/Market/14th	**>80/1.21**	**F**	**>80/1.32**	**F**	**>80/1.46**	**F**	**>80/1.33**	**F**	**>80/1.43**	**F**
67. Sanchez/Market/15th	**76.5**	**E**	**>80/1.33**	**F**	**>80/1.33**	**F**	**>80/1.28**	**F**	**>80/1.28**	**F**
26. Octavia/Market/U.S. 101	38.7	D	51.5	D	51.8	D	**>80/1.02**	**F**	**>80/1.02**	**F**

Notes:
[1] Delay presented in seconds per vehicle. For unsignalized intersections, delay and LOS presented for worst approach. Worst approach indicated in ( ).
[2] Intersections operating at LOS E or LOS F conditions highlighted in **bold,** and overall intersection volume-to-capacity (v/c) ratio is presented for intersections operating at LOS F.
Source: Data compiled by Fehr & Peers in 2010

- Divisadero/Haight
- Castro/Duboce
- Castro/14th
- Castro/Market/17th
- Sanchez/Market/15th

Because the proposed project at the Davies Campus would not contribute significantly to the poor operating conditions, **project-related traffic impacts at these five study intersections would be less than significant**.

IMPACT TR-75 *Implementation of the Davies Campus project would have a significant impact at the intersection of Church/Market/14th Street that would operate at LOS F under 2020 Modified Baseline No Project conditions. (Significant and Unavoidable)*

At the signalized intersection of Church/Market/14th Street which would operate at LOS F under 2020 Modified Baseline No Project conditions, and would continue to operate at LOS F under 2020 Modified Baseline conditions, the increase in vehicle trips from 2020 Modified Baseline No Project were reviewed to determine whether the increase would contribute considerably to critical movements operating at LOS E or LOS F. Based on this examination, **the project would result in a significant impact**.

Roadway capacity at this intersection has been maximized and potential improvements are limited by the right-of-way constraints and competing traffic volume demands on the north/south and east/west approaches. Improvements such as signal timing changes may improve operating conditions at the approaches experiencing high delays, however they would not substantially improve overall intersection operations, and may be infeasible due to traffic, transit or pedestrian signal timing requirements. Providing additional travel lanes at this intersection would require substantial reduction in sidewalk widths, which would be inconsistent with the pedestrian environment encouraged by the City of San Francisco. No feasible mitigation measures have been identified, and **traffic impact at the intersection of Church/Market/14th Street would remain significant and unavoidable**.

IMPACT TR-76 *Implementation of the Davies Campus project would have a less-than-significant impact at seven study intersections that would operate at LOS D or better under 2020 Modified Baseline plus Project conditions. (Less than Significant)*

With implementation of the Davies Campus project, the following seven study intersections would continue to operate at LOS D or better during the a.m. and p.m. peak hours under 2020 Modified Baseline conditions, and **therefore, traffic impacts at these locations would be less than significant:**

- Scott/Duboce
- Noe/Duboce
- Noe/14th
- Sanchez/Duboce
- Fillmore/Duboce
- Church/Duboce
- Octavia/Market/U.S. 101

IMPACT TR-77 *Implementation of the Davies Campus project would not cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity, resulting in unacceptable levels of transit service. (Less than Significant)*

The Davies Campus project would generate 138 net-new transit trips during the weekday p.m. peak hour, as shown in Table 4.5-11 (page 4.5-77), eight inbound and 130 outbound. Transit trips to and from the Davies Campus would utilize nearby Muni bus lines, and may include transfers to other Muni bus and light rail lines, or other regional transit providers.

Table 4.5-36 (page 4.5-172) summarizes the corridor capacity utilization analysis for the routes serving the Davies Campus vicinity. The additional transit demand could be accommodated during the p.m. peak hour, and all four corridors would continue to operate at less than Muni's 85 percent capacity utilization standards. Therefore, the **impacts on transit capacity relevant to the Davies Campus at the study area corridors would be less than significant**.

The CPMC shuttles serving the Davies Campus would be adequately accommodated on-site within the approximately 90-foot long passenger loading/unloading zone located between the 45 Castro MOB and the north hospital tower, as well as the interior passenger loading/unloading loop in front of the south hospital tower. Therefore, **impacts of shuttle service on nearby transit lines would be less than significant**.

IMPACT TR-78 *Implementation of the Davies Campus project would not create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the project site and adjoining areas. (Less than Significant)*

The Planning Code requires that the Davies Campus project provide bicycle parking as well as showers and locker facilities. The Davies Campus project would meet the Planning Code requirements, which would result in an increase over existing conditions in the number of bicycle parking spaces.

The San Francisco Bicycle Plan includes a number of projects in the area that would improve bicycle circulation. If implemented, new bicycle lanes would be provided on 17th Street, which would improve east-west access by connecting the existing bicycle lanes on Market Street, Valencia Street, Harrison Street, and Potrero Avenue. A new, left-turn lane for bicyclists has recently been striped on Scott Street between Oak Street and Fell Street.

During the p.m. peak hour, a portion of the 34 “other” trips identified in Table 4.5-11 (page 4.5-77) would be expected to be by bicycle, and would be accommodated on adjacent roadways. Although the Davies Campus project would result in an increase in the number of vehicles in the vicinity of the project site, these new trips would not affect bicycle travel in the area, and therefore, **impact on bicyclists would be less than significant**.

IMPACT TR-79 *Implementation of the Davies Campus project would not result in substantial overcrowding on public sidewalks, create hazardous conditions for pedestrians, or otherwise impact pedestrian accessibility to the project site or adjoining areas. (Less than Significant)*

The Davies Campus project would result in an increase in pedestrian activity in the vicinity of the campus, including walk trips to and from the new uses, plus walk trips to and from Muni bus stops. Overall, during the p.m. peak hour the project would add about 148 net-new pedestrian trips (an increase of 10 walk trips, and 138 net-new trips that account for walk trips to and from the Muni bus stops) to the surrounding streets.

Pedestrian access to the Castro Street/14th Street MOB would be from Castro Street and Duboce Avenue. The entrance to the Neuroscience Institute building would be located on Noe Street, south of Duboce Avenue.

The majority of the pedestrian trips would be to and from the transit stops on Castro Street, Duboce Avenue, Church Street and Market Street. Approximately 74 of the 146 new pedestrian trips during the p.m. peak hour would be to the N-Judah stop located at the intersection of Noe/Duboce. This unsignalized intersection was observed to have relatively high pedestrian volumes, primarily when a light rail vehicle was present at the stop. Since the N-Judah stop is parallel to Duboce Park, transit riders exiting the westbound light rail vehicle and other pedestrians must wait for the light rail vehicle to exit the station before crossing Duboce Avenue. The additional pedestrian trips generated by the Davies Campus project could be accommodated within the existing crosswalk. In addition, some pedestrian trips would include transit riders walking towards Church Street to access the 22-Fillmore and J-Church stops, and during the p.m. peak hour, these additional 34 pedestrians would be accommodated within the existing sidewalks. The net-new pedestrian trips generated by the Davies Campus project would not result in substantial overcrowding on the sidewalks or hazardous conditions. Therefore, **the impacts on pedestrian conditions on the Davies Campus would be less than significant**.

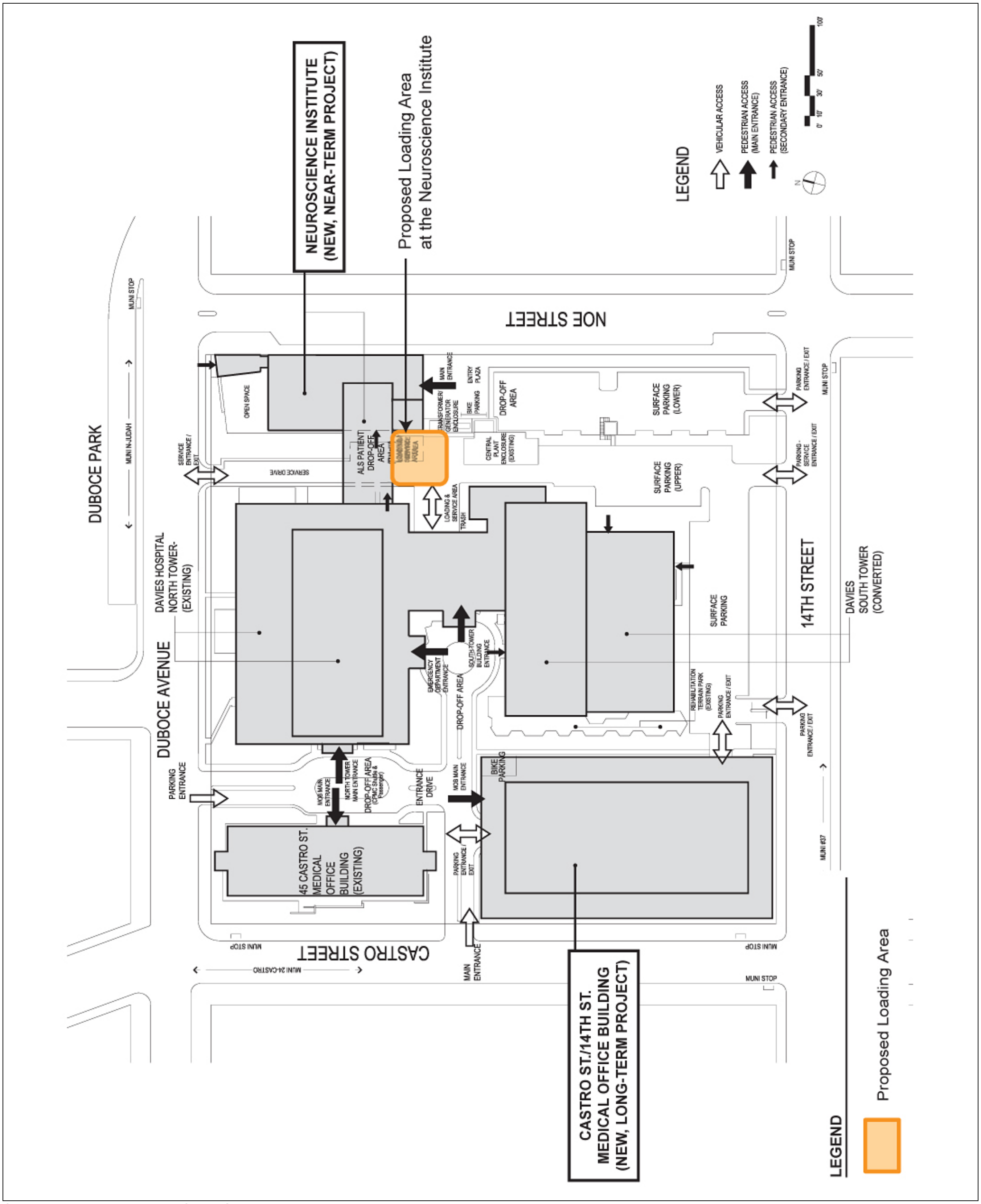
IMPACT TR-80 *Implementation of the Davies Campus project would not result in a loading demand during the peak hours of loading activities that could not be accommodated within the proposed loading supply, or within on-street loading zones, and would not create potentially hazardous conditions. (Less than Significant)*

At buildout of the Davies Campus, a total of four on-site loading spaces would be provided, including three spaces in the existing loading dock between the Davies Hospital North and South Towers, and one new loading space that would be located adjacent to the Neuroscience Institute. It is anticipated that, similar to existing conditions, service vehicle and truck loading/unloading activities would also occur within off-street curbside passenger zones and surface parking areas. Figure 4.5-24, “Davies Campus—Proposed Truck and Service Vehicle Loading” (page 4.5-190), presents the location of the proposed truck and service vehicle loading/unloading zones.

As indicated in Table 4.5-27 (page 4.5-137), the proposed project would generate a demand for eight service vehicle and truck loading/unloading spaces during the peak hour of loading activities. Because only four loading spaces would be provided, a portion of the loading demand would need to be accommodated within the on-site loading/unloading zones and surface parking areas. Based on surveys of existing loading/unloading activities, approximately half of all deliveries to the Davies Campus are anticipated to be by vehicles 20 feet long or shorter, with a delivery duration of 15 minutes or less, and therefore, the use of the on-site curbside loading/unloading zones for deliveries would not substantially affect passenger loading/unloading activities at these locations. Because the loading demand would be accommodated within the existing and proposed loading spaces, the peak loading demand would be accommodated, and **loading impacts on the Davies Campus would be less than significant**.

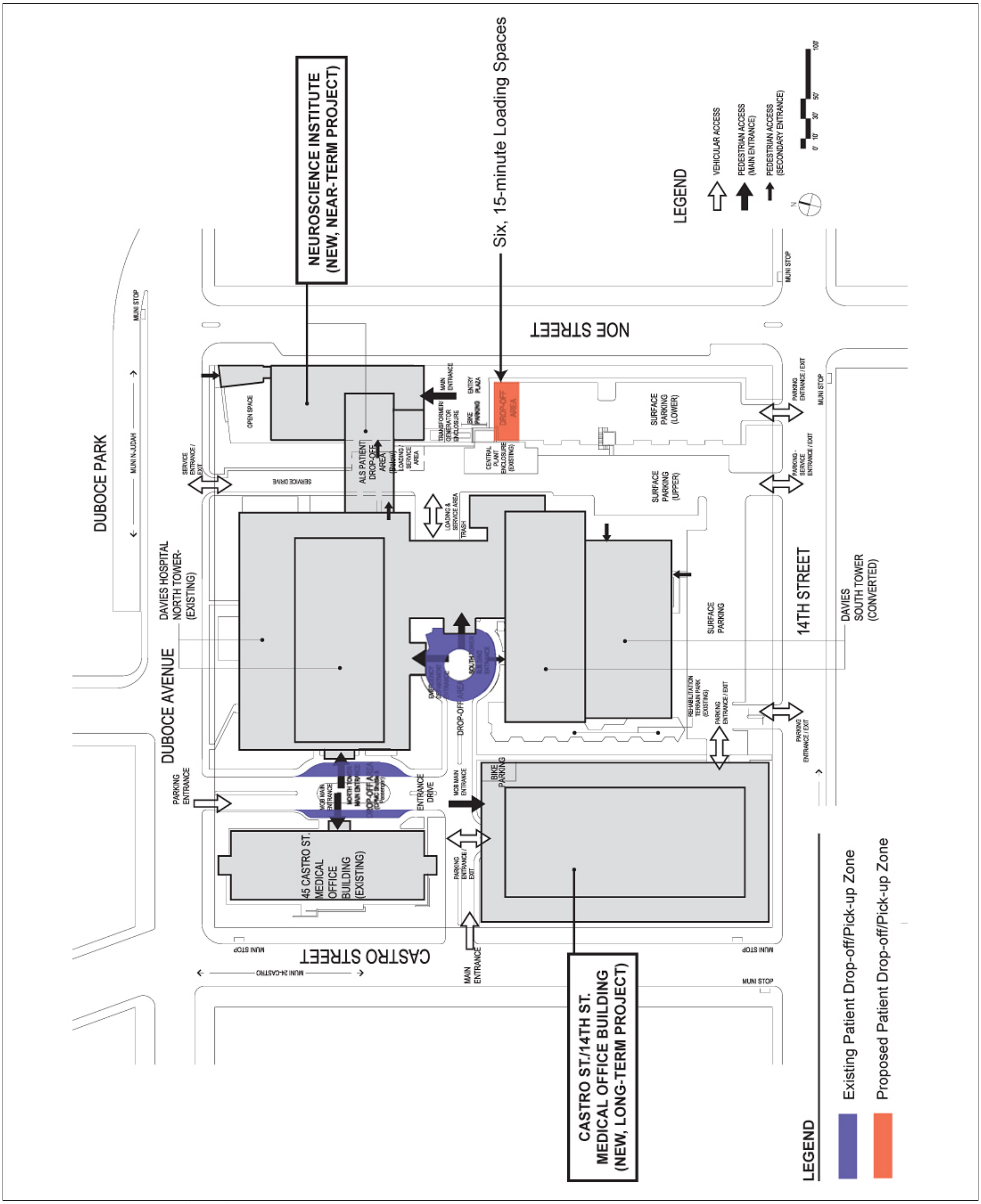
IMPACT TR-81 *Implementation of the Davies Campus project would not result in a passenger loading/unloading demand that could not be accommodated within the existing and proposed passenger loading/unloading zones, and would not create potentially hazardous conditions. (Less than Significant)*

The proposed Neuroscience Institute building would have a passenger loading area accessible from 14th Street that would include six short-term passenger loading/unloading spaces. In addition, the existing passenger zone within the existing interior driveway loop between the two hospital towers and along the driveway entrance from Duboce Avenue would be maintained (combined total of 377 feet of passenger zone), for about 497 feet of passenger loading/unloading zones. Figure 4.5-25, “Davies Campus—Proposed Passenger Zones” (page 4.5-191), presents the location of the passenger loading/unloading zones.



Source: Data provided by SmithGroup in 2010

Davies Campus—Proposed Truck and Service Vehicle Loading **Figure 4.5-24**



Source: Data provided by SmithGroup in 2010

Davies Campus—Proposed Passenger Zones **Figure 4.5-25**

Existing uses at the Davies Campus, the near term Neuroscience Institute building, and the long term Castro Street/14th Street MOB would use the existing passenger loading/unloading zones. As indicated in Table 4.5-28 (page 4.5-144), the projected peak demand for about 376 feet of passenger loading/unloading activity would be accommodated within the proposed supply of 497 feet of passenger loading/unloading zone. Therefore, **the impact on passenger loading/unloading activity on the Davies Campus would be less than significant**.

While the loading impact would be less than significant, implementation of Improvement Measure I-TR-81 below would further reduce the less than significant passenger loading/unloading impact and the potential for conflicts between vehicles entering and exiting the Davies Campus via Castro Street.

Improvement Measure I-TR-81 Provide Appropriate Signage

To facilitate passenger drop off and pick up activities, CPMC shall provide signage to clearly indicate that visitors to the new Castro Street/14th Street MOB proceed to the existing passenger loading/unloading zones. Alternately, CPMC shall incorporate a passenger zone within the new parking structure at the interior entrance to the Castro Street/14th Street MOB.

IMPACT TR-82

Implementation of the Davies Campus project would not result in a significant emergency vehicle access impact. (Less than Significant)

The Davies Campus project would not change the existing access points for emergency vehicles entering the campus, nor change or increase the area used for emergency care. The existing ambulance parking space at the entrance off of Castro Street would be maintained. Although there would be increased vehicle trips and passenger loading/unloading activity associated with the Castro/14th Street MOB, it is not anticipated that the increased intensity of vehicle activity associated with the Castro/14th Street MOB would interfere with emergency vehicle access. **Impact on emergency vehicle access on the Davies Campus would be less than significant**.

IMPACT TR-83

Implementation of construction-related activities on the Davies Campus would not cause a significant impact because of their temporary and limited duration. (Less than Significant)

The Davies Campus project would be constructed over multiple years between 2011 and 2020, starting with the construction of the Neuroscience Institute building on the northeast corner of the campus, and followed by the Castro Street/14th Street MOB and garage. The Neuroscience Institute building would be constructed by 2012, and the Castro Street/14th Street MOB would be constructed and occupied by 2019.

During construction, access to the portions of the Davies Campus under construction would be restricted to allow for construction activities to be staged on-site. During construction of the Neuroscience Institute building, access to the eastern surface parking lots on the project site would be closed and accessible only to contractors; however, all other access points to the campus would remain open.

During construction, the on-campus parking supply would be significantly reduced to accommodate construction staging. With the construction of the Neuroscience Institute building and demolition of the existing parking garage for the Castro Street/14th Street MOB, only 116 of the existing 496 on-site parking spaces would be available for patients, visitors, doctors, and employees. To accommodate the parking demand associated with existing uses on the site that would remain during the construction period, the following parking demand strategies developed by CPMC would be implemented.

- **Valet Parking:** Use of valet parking would allow for an additional 40 vehicles to be parked on-site.

- **Patient/Visitor Parking:** Patients and visitors would be given priority use of the 156 spaces that would be available (116 existing spaces, 40 additional spaces via valet). Based on parking surveys conducted by CHS Consulting in 2006, the existing uses generate an on-site parking demand of 134 spaces. Upon completion of the Neuroscience Institute, but before completion of the Castro Street/14th Street MOB, the parking demand would increase to 206 spaces. It is anticipated that a portion of the patient and visitor parking demand (those parking for shorter periods of time) could be accommodated on-street. Additionally, on-site parking, at times, may be required to be more heavily managed by increasing the amount of valet parked cars, in order to ensure the efficient use of the limited supply of parking spaces on the campus during construction of the Castro Street/14th Street MOB.

- **Physician Parking:** Given the limited supply of on-site parking spaces, the majority of physicians, with the exception of those on high-priority or emergency calls, would be required to park off-site. The physicians would have an estimated demand for 105 parking spaces, and up to 105 physicians would need to park off-site and take a shuttle to the campus. For doctors on high-priority of emergency calls, if on-site parking is not available, CPMC would make other arrangements, such as off-site valet services and the use of parking lifts, if needed, to accommodate the demand. Even with these arrangements, physicians not responding to high-priority or emergency calls would be required to park off-site.

- **Employee Parking:** All employees would be required to park off-site and would be shuttled to and from the campus. CPMC would provide up to 582 off-site parking spaces to accommodate the physicians (105 spaces) and employees (477 spaces). Shuttles would run at 5- to 6-minute headways during the peak periods to meet the projected demand.

Neuroscience Institute Building—Construction of the proposed Neuroscience Institute building would occur over approximately 2 years and primarily affect the northeast portion of the campus. Staging would occur just to the south of the proposed building site, within the existing surface parking lot.

No vehicular traffic detours, lane closures or emergency vehicle access issues are anticipated with the construction of the Neuroscience Institute building until the fourth floor is being constructed. At the time of the fourth floor construction, flag personnel would be in place to direct traffic accessing the driveway above the grade level of the Neuroscience Institute building. Although the loading dock would remain open throughout construction, flag personnel would control delivery traffic needing access to the loading dock, trash area and central utility plant, so that deliveries and construction vehicles did not conflict in the service driveway. This driveway would also be the fire lane access for the lower portion of the Davies Campus.

Materials for construction would enter the site through the existing driveway located on 14th Street and the existing service driveway on Duboce Avenue. Trucks would not use Noe Street to access the site. Trucks exiting the project site would be directed to take 14th Street to Guerrero Street. Trucks circulating around the campus would primarily affect the intersections on each corner of the project block.

Construction of the proposed Neuroscience Institute building would not require any existing transit facilities to be relocated during construction. The construction of the building may be concurrent with SFMTA planned construction of the Duboce Avenue/Church Street Light Rail Replacement project. To minimize potential conflicts, CPMC would be required to coordinate with SFMTA.

The additional construction-related truck traffic may increase pedestrian and bicycle conflicts in the area immediately surrounding the site; however, the construction plan would close sidewalks and parking lanes immediately adjacent to the construction site to minimize these conflicts. During the entire duration of construction, the 300 foot long section of sidewalk on the west side of Noe Street would be closed to pedestrians. This area would be used as a construction buffer zone, and would require that pedestrians coming from Duboce Avenue or 14th Street use the east side of Noe Street. During the entire duration of construction "Sidewalk Closed—Please Use Sidewalk on Other Side of Street" signs would be posted and maintained to alert pedestrians to take alternate routes. In addition to the sidewalk closure, construction would require the temporary closure of approximately 200 feet of the existing parking lane along the west side of Noe Street. The construction of the new buildings should not require any shift in pedestrian access in and around the existing campus buildings. Throughout the construction duration, construction trailers would be located within the construction site boundaries near 14th Street on Noe Street.

Carpooling and utilizing public transportation would be encouraged throughout the construction to reduce the parking demand. Employee and construction worker parking during construction of the Neuroscience Institute would be housed in the existing Davies Campus parking structure and the Noe Street/Market Street public parking garage located at 254 Noe Street. Some construction workers who drive to the project site may also park on-street. Parking spaces on the blocks around the campus during the daytime are approximately 70 to 100 percent occupied. Workers may find available parking in these areas; however, they would be subject to posted RPP parking time restrictions.

Castro Street/14th Street MOB—Construction of the Castro Street/14th Street MOB would occur over approximately 2 years and primarily affect the southwestern portion of the campus. Construction of the new MOB would require the closure of main entrance to the Campus located on Castro Street. During construction, all nonconstruction-related vehicle access would use the Duboce Avenue entrance to the Davies Campus, including all emergency vehicles to and from the emergency department.

The additional construction-related truck traffic may increase pedestrian and bicycle conflicts in the area immediately surrounding the site; however, the construction plan would close sidewalks and parking lanes immediately adjacent to the construction site to minimize these conflicts. During construction the 220-foot long section of sidewalk on the north side of 14th Street would be closed to pedestrians. This area would be used as a pedestrian safety buffer zone, and would, subject to City approval, require that pedestrians on 14th Street or Castro Street use the south side of 14th Street or west side of Castro Street. During construction, "Sidewalk Closed—Please Use Sidewalk on Other Side of Street" signs would be posted to alert pedestrians to take alternate routes. Construction trailers would be located within the construction site boundaries on the 14th Street side of the project. Flag personnel would be provided at all active access exit gates on the project during construction work hours.

CPMC would provide off-site parking for construction workers during construction of the Castro/14th Street building. These spaces would be provided at the Market/Noe Street garage, the Japan Center Parking Garage, and the Civic Center Parking Garage (355 McAllister Street). A shuttle would be available to those workers parking in the Japan Center Garage. Some workers who drive to the site may also park on-street; however, on-street parking in the campus vicinity is generally short term or subject to RPP parking restrictions.

In general, lane and sidewalk closures as a part of construction activity are subject to review and approval by the TASC. Overall, the Davies Campus project construction would not substantially affect traffic, transit, pedestrian and bicycle circulation, and any potential impacts would not be considered significant due to their temporary and limited duration. Therefore, **construction impact associated with the Davies Campus project would be less than significant**.

Parking Discussion

San Francisco does not consider parking supply as part of the permanent physical environment and, therefore, does not consider changes in parking conditions to be environmental impacts as defined by CEQA. The San Francisco Planning Department acknowledges, however, that parking conditions may be of interest to the public and the decision-makers. Therefore, a parking analysis and discussion for the proposed LRDP is presented for information purposes.

Parking conditions are not static because parking supply and demand vary from day to day, from day to night, and from month to month. The availability or lack of parking spaces is not a permanent physical condition but changes over time whenever people change their modes and patterns of travel. Parking deficits are considered to be social effects, rather than impacts on the physical environment as defined by CEQA. Under CEQA, a project's social impacts need not be treated as significant impacts on the environment. Environmental documents should, however, address the secondary physical impacts that could be triggered by a social impact (State CEQA Guidelines, Section 15131[a]).

The social inconvenience of parking deficits, such as having to hunt for scarce parking spaces, is not an environmental impact, but there may be secondary physical environmental impacts, such as increased traffic congestion at intersections, air quality impacts, safety impacts, or noise impacts caused by congestion. In the experience of San Francisco transportation planners, however, the absence of a ready supply of parking spaces, combined with available alternatives to auto travel (e.g., transit service, taxis, bicycles or travel by foot) and a relatively dense pattern of urban development, induces many drivers to seek and find alternative parking facilities, shift to other modes of travel, or change their overall travel habits. Any such resulting shifts to transit service in particular, would be in keeping with the City's Transit-First Policy (Charter Article 8A, Section 8A.115). This policy provides that: "parking policies for areas well served by public transit shall be designed to encourage travel by public transportation and alternative transportation."

The transportation analysis accounted for potential secondary effects, such as cars circling and looking for a parking space in areas of limited parking supply, assuming that all drivers would attempt to find parking at or near the project site and then seek parking farther away if more convenient parking was unavailable. Moreover, the analysis took into account that the secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to others who are aware of constrained parking conditions in a given area. Any secondary environmental impacts that might result from a shortfall in parking in the vicinity of the proposed project would be minor, and the traffic assignments used in the transportation analysis, as well as in the associated air quality, noise, and pedestrian safety analyses, reasonably addresses potential secondary effects.

The Davies Campus currently contains 496 off-street parking spaces, including 290 in structured parking and 206 in surface lots. With implementation of the CPMC LRDP, a total of 626 parking spaces would be provided, including 490 spaces provided in the 14th Street/Castro Street MOB parking structure, and 136 spaces in Noe Street surface lots. The proposed project would be required to meet Planning Code requirements for the number of spaces, as well as the number of handicapped-accessible parking spaces, bicycle parking spaces, and car share spaces.

Table 4.5-34 (page 4.5-164) presents a comparison of the proposed supply to the estimated parking demand. At buildout, there would be a peak parking demand of about 833 spaces, compared with a total supply of 626 spaces. Overall, there would be a shortfall of 207 spaces, including a shortfall of 171 spaces for employees and 36 spaces for patients and visitors. It is anticipated that short-term visitors to the Davies Campus unable to find parking on the campus would likely park in any available on-street parking space around the campus, although some may also choose to take transit, bicycle or walk instead of driving. Employees unable to park at the campus would take transit, bicycle or walk to the campus, or park in one of CPMC's other campus parking facilities or within other facilities such as the Japan Center Garage where CPMC is anticipated to continue to lease 400 parking spaces. Employees who chose to park in off-site facilities may increase the demand for CPMC shuttle services.

◆ St. Luke's Campus

PROPOSED PROJECT AT ST. LUKE'S CAMPUS

The proposed project at St. Luke's Campus would be near term. Construction of the Replacement Hospital and the proposed MOB/Expansion building would be focused on the northern portion of the campus. No changes are proposed for the 1912 Building, Monteagle Medical Center, Duncan Street Parking Garage, and Hartzell Building. Figure 2-59, "St. Luke's Campus—Proposed Site Plan" (page 2-197), illustrates the proposed plan for the St. Luke's Campus.

An approximately 80-bed, 145,000-sq.-ft., St. Luke's Replacement Hospital is proposed on the project site, west of the existing St. Luke's Hospital tower. Specifically, the Replacement Hospital would occupy the site of the existing 3615 Cesar Chavez Street Surface Parking Lot. A portion of the proposed Replacement Hospital would also be constructed across a section of San Jose Avenue.[36] The proposed St. Luke's Replacement Hospital would replace the acute-care hospital uses in the existing St. Luke's Hospital tower by 2015. The existing St. Luke's Hospital tower would then be demolished and an approximately 201,000-sq.-ft., five-story MOB/Expansion Building would be constructed at the site of the former hospital tower. The MOB/Expansion Building would

[36] The St. Luke's Campus has an encroachment permit from the City since 1968 for the portion of San Jose Avenue between 27th Street and Cesar Chavez Street. That portion of San Jose Avenue has been closed to traffic, and is used for on-street parking for St. Luke's Hospital. As part of the project, this section of San Jose Avenue would be vacated by the City and permanently closed.

include medical offices, diagnostic and treatment space, lobby space and building infrastructure, outpatient care, and four belowground parking levels that would provide approximately 220 parking spaces.

ST. LUKE'S CAMPUS PROPOSED SITE ACCESS

The main entrance to the St. Luke's Replacement Hospital would be from a central plaza area (Figure 2-59, page 2-197). The main building entrance would provide access to the Replacement Hospital at Level 1 close to Cesar Chavez Street and at Level 2 close to San Jose Avenue/27th Street. Access to the 1957 Building would be available via the path through the Duncan Street Parking Garage or from points off Cesar Chavez Street. Passenger drop-off to the main entrance of the Replacement Hospital would be from a white-zone drop-off area located along Cesar Chavez Street at midblock between Guerrero and Valencia Streets. A second curbside passenger zone would be located at the intersection of San Jose Avenue and 27th Street. The Duncan Street Parking Garage would continue to be accessed from San Jose Avenue near its intersection with Duncan Street, as under existing conditions.

The proposed Emergency Department would be located at Level 2 in the southern portion of the Replacement Hospital. Vehicular ingress and egress to the Emergency Department would be from 27th Street near its connection to San Jose Avenue. The primary loading dock for the Replacement Hospital would be located at Level 1 on the north side of the hospital. Service vehicles would enter and exit the loading area from Cesar Chavez Street.

Entrances to the MOB/Expansion Building would be located at the building's southwest corner (entrance to Level 2) and at its northeast corner at Valencia and Cesar Chavez Streets (entrance to Level 1) (Figure 2-59, page 2-197). This point of access would be for retail uses along Cesar Chavez Street. Vehicular access to the underground parking garage at the MOB/Expansion Building would be available from Cesar Chavez Street or Valencia Street.

Implementation of the St. Luke's Campus project would require the following sidewalk, on-street parking, bus stop and street closures:

- A new curb cut for the Replacement Hospital's driveway onto Cesar Chavez Street would be constructed approximately 166 feet east of Guerrero Street.
- Curb cuts would be constructed at the Replacement Hospital's driveway onto Cesar Chavez Street.
- Curb cuts would be constructed at the MOB/Expansion Building's driveway onto Cesar Chavez Street. This is an existing curb cut for the existing hospital's front parking lot. Vehicle access to the MOB/Expansion Building would be right-turn-in and right-turn-out via Cesar Chavez Street.

- Curb extensions would be constructed on the southwest corner of the intersection of Valencia Street/Cesar Chavez Street.

- The existing driveway on Valencia Street approximately 30 feet south of Cesar Chavez Street would be relocated approximately 60 feet south to serve the new parking garage at the MOB Expansion site.

- An approximately 108 foot long curb-side passenger loading zone would be located on Cesar Chavez Street between Guerrero Street and Valencia Street to serve the Replacement Hospital. This proposed new passenger zone would require removal of up to six on-street parking spaces.

- The existing Muni bus stop on Valencia Street south of the Cesar Chavez Street would be relocated approximately 130 feet south, to the far side of the proposed driveway into the new MOB Expansion parking garage. This bus stop relocation would require the removal of up to five parking spaces.

- Prior to construction of the Replacement Hospital, San Jose Avenue between 27th Street and Cesar Chavez Street would be vacated by the City and permanently closed. This portion of San Jose Avenue has been closed from public use under a temporary encroachment permit since 1968. This area is closed to traffic and is used as reserved parking spaces for the St. Luke's Hospital. The street vacation would permanently remove the 21 existing reserved on-street parking spaces. A curbside passenger zone would be provided at the intersection of the closed San Jose Avenue at 27th Street.

Permanent changes to the streetscape along Cesar Chavez Street and Valencia Street would be coordinated with the City's on-going streetscape planning efforts for Cesar Chavez and Valencia Street. The Cesar Chavez Streetscape Plan is a detailed design effort to re-envision Cesar Chavez Street between Hampshire and Guerrero Streets in the Mission District. The Cesar Chavez Streetscape Plan consists generally of a widened median with trees and landscaping, large corner curb extensions, improved pedestrian crossings, and dedicated left turn pockets for vehicles. These improvements would likely include the removal of one travel lane in each direction (from three to two lanes in each direction) and accommodate a 5-foot wide bicycle lane in each direction.

The St. Luke's Campus impact analysis also considered an Alternate Emergency Department Location Variant. Under this variant, the Emergency Department and ambulance bay for the St. Luke's Replacement Hospital would be relocated from the south side of the building near the intersection of San Jose Avenue and 27th Street, where it is proposed to be located under the LRDP, to the north side of the Replacement Hospital on Cesar Chavez Street (i.e., where the loading dock would be located under the proposed LRDP). A walk-in entrance to the Emergency Department would be located at the northeast corner of the Replacement Hospital, on the first floor. The loading dock would be relocated to the southwest corner, on the second floor, and service vehicles would enter the loading dock from 27th Street.

Impacts associated with the project proposed at St. Luke's Campus are presented below. The following are the topics addressed and the impacts analyzed for those topics:

- *Traffic:* Impacts TR-84 and TR-85
- *Transit:* Impact TR-86
- *Bicycle:* Impact TR-87
- *Pedestrian:* Impact TR-88
- *Loading:* Impacts TR-89 through TR-91
- *Emergency vehicle access:* Impacts TR-92 and TR-93
- *Construction:* Impact TR-94

IMPACT TR-84 *Implementation of the St. Luke's Campus project would have less-than-significant impact at six study intersections that would operate at LOS E or LOS F under 2015 Modified Baseline No Project conditions and 2015 Modified Baseline plus Project conditions. (Less than Significant)*

The St. Luke's Campus project would result in a net increase of 207 vehicle trips during the p.m. peak hour (26 net-new inbound and 181 net-new outbound trips). As indicated in Table 4.5-39, "Levels of Service at St. Luke's Campus Study Intersections—P.M. Peak-Hour Conditions" below, the additional vehicle trips would not cause the level of service at the study intersections to change from acceptable to unacceptable levels; however, under both 2015 Modified Baseline No Project and Modified Baseline plus Project conditions, six of the 15 study intersections would operate at LOS E or LOS F conditions during the p.m. peak hour.

- The St. Luke's Campus project would have less than significant contributions at six study intersections that would operate at LOS E or LOS F under 2015 Modified Baseline conditions and continue to operate at LOS E or LOS F under 2015 Modified Baseline plus Project conditions (Impact TR-84).

- The St. Luke's Campus Project would have less-than-significant impacts at nine study intersections that would operate at LOS D or better under 2015 Modified Baseline plus Project conditions (Impact TR-85).

The six intersections that would operate at LOS E or LOS F under 2015 Modified Baseline No Project conditions and 2015 Modified Baseline plus Project conditions include:

- Cesar Chavez/Valencia
- Cesar Chavez/Guerrero
- Guerrero/27th
- Guerrero/28th
- Cesar Chavez/South Van Ness
- Cesar Chavez/Dolores

At these six intersections the increase in vehicle trips generated by the St. Luke's Campus project was reviewed to determine whether the project's increase would contribute considerably to critical movements operating at LOS E or LOS F at these intersections. Based on this examination, **the traffic impact at these six intersections were determined to be less than significant**.

IMPACT TR-85 *Implementation of the St. Luke's Campus project would have less-than-significant impacts at nine study intersections that would operate at LOS D or better under 2015 Modified Baseline plus Project conditions. (Less than Significant)*

With implementation of the St. Luke's Campus project, the following nine study intersections would continue to operate at LOS D or better during the a.m. and p.m. peak hours under 2015 Modified Baseline conditions, and **therefore, traffic impacts at these locations would be less than significant:**

- Cesar Chavez/Bartlett
- Guerrero/Duncan
- Mission/Valencia/Fair
- Cesar Chavez/Mission
- Guerrero/26th
- San Jose/29th
- Valencia/26th
- Valencia/Duncan/Tiffany
- Mission/29th

IMPACT TR-86 *Implementation of the St. Luke's Campus project would not cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity, resulting in inacceptable levels of transit service. (Less than Significant)*

The St. Luke's Campus project would generate 39 p.m. peak-hour net-new transit trips (9 inbound and 30 outbound), as shown in Table 4.5-11 (page 4.5-77). Transit trips to and from the St. Luke's Campus would utilize nearby Muni bus lines, and may include transfers to other Muni bus and light rail lines, or other regional transit providers.

Table 4.5-21 (page 4.5-119) summarizes the corridor capacity utilization analysis for the 10 Muni routes serving the St. Luke's Campus vicinity. The additional transit demand could be accommodated during the p.m. peak hour, and all four corridors would continue to operate at less than Muni's 85 percent capacity utilization standards. Therefore, **St. Luke's Campus project impacts on transit capacity at the study area corridors would be less than significant**.

Table 4.5-39
Levels of Service at St. Luke's Campus Study Intersections—P.M. Peak-Hour Conditions

	Existing		Modified Baseline 2015				Cumulative			
			2015 No Project		2015 Project		2030 No Project		2030 Project	
	Delay/v/c [1, 2]	LOS	Delay/v/c	LOS	Delay/v/c	LOS	Delay/v/c	LOS	Delay/v/c	LOS
68. Cesar Chavez/Valencia	38.1	D	**>80/1.18**	**F**	**>80/1.19**	**F**	**>80/1.24**	**F**	**>80/1.25**	**F**
69. Cesar Chavez/Guerrero	37.9	D	**>80/0.95**	**F**	**>80/0.95**	**F**	**>80/1.08**	**F**	**>80/10.9**	**F**
70. Cesar Chavez/Bartlett	12.4(sb)	B	20.2(sb)	C	20.4(sb)	C	23.1(sb)	C	23.4(sb)	C
71. Guerrero/27th	**>50(eb)**	**F**	**>50(eb)**	**F**	**>50(eb)**	**F**	**>50(eb)**	**F**	**>50(eb)**	**F**
72. Guerrero/28th	**38.4(eb)**	**E**	**>50(eb)**	**F**	**>50(eb)**	**F**	**>50(eb)**	**F**	**>50(eb)**	**F**
73. Guerrero/Duncan	13.5	B	15.6	B	16.0	B	18.0	B	18.3	B
74. Mission/Valencia/Fair	11.0	B	31.5	C	39.6	D	32.9	D	40.6	D
75. Cesar/South Van Ness	24.8	C	**>80/1.99**	**F**	**>80/2.00**	**F**	**>80/2.22**	**F**	**>80/2.23**	**F**
76. Cesar Chavez/Mission	22.6	C	29.3	C	29.7	C	50.6	D	51.9	D
77. Cesar Chavez/Dolores	38.8	D	**63.7**	**E**	**65.6**	**E**	**>80/1.19**	**F**	**>80/1.19**	**F**
78. Guerrero/26th	12.6	B	15.3	B	16.2	B	22.3	C	23.9	C
79. San Jose/29th	17.9	B	22.8	C	24.0	C	37.9	D	40.5	D
80. Valencia/26th	18.3	B	20.7	C	20.8	C	23.1	C	23.3	C
81. Valencia/Duncan/Tiffany	9.0(nb)	A	9.3(nb)	A	9.6(nb)	A	9.3(nb)	A	9.6(nb)	A
82. Mission/29th	13.2	B	14.5	B	14.5	B	18.0	B	18.1	B

Notes:
[1] Delay presented in seconds per vehicle. For unsignalized intersections, delay and LOS presented for worst approach. Worst approach indicated in ( ).
[2] Intersections operating at LOS E or LOS F conditions highlighted in **bold,** and overall intersection volume-to-capacity (v/c) ratio is presented for intersections operating at LOS F.
Source: Data compiled by Fehr & Peers in 2010

The CPMC shuttle stop would be located at the proposed passenger loading/unloading zone at the intersection of 27th Street and San Jose Avenue. Since the shuttle stop would not be on streets with Muni bus routes (e.g., Valencia Street), shuttle stop activities would not conflict with Muni operations. Therefore, the **impact of shuttle service on nearby transit lines would be less than significant**.

IMPACT TR-87	*Implementation of the St. Luke's Campus project would not create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the project site and adjoining areas. (Less than Significant)*

The Planning Code requires that the St. Luke's Campus project provide bicycle parking as well as showers and locker facilities. It is anticipated that the St. Luke's Campus project would meet the Planning Code requirements, which would result in an increase over existing conditions in the number of bicycle parking spaces.

The St. Luke's Campus project would not include any design elements that would inhibit bicycle activity in the campus vicinity, nor would it interfere with implementation of the elements of the Bicycle Plan on Cesar Chavez Street. As noted above, the proposed Cesar Chavez Streetscape improvements would provide a bicycle lane in each direction on Cesar Chavez Street. The proposed passenger loading/unloading zone and off-street loading area for the Replacement Hospital on Cesar Chavez Street would create a new conflict point between loading activities, vehicles, and bicyclists on Cesar Chavez Street. Vehicle/bicycle/pedestrian conflicts would be similar to those that occur at the existing passenger loading/unloading zone adjacent to the existing hospital on Valencia Street, although on Valencia Street traffic volumes are lower and bicycle volumes are higher than they would be on Cesar Chavez Street with the noted improvements. The new parking garage access on Valencia Street and new project-generated vehicle trips to this facility would result in increased vehicle/bicycle conflicts on a street that is designed to facilitate bicycle travel.

During the p.m. peak hour, a portion of the six "other" trips identified in Table 4.5-11 (page 4.5-77) would be expected to be by bicycle. Although the St. Luke's Campus project would result in an increase in the number of vehicles in the vicinity of the project site, these new trips would not affect bicycle travel in the area, and therefore, the **impact on bicyclists would be less than significant**.

Although bicycle impacts would be less than significant, implementation of Improvement Measure I-TR-87 below would further reduce less-than-significant impacts by requiring pedestrian and bicycle warning signals at the proposed garage exits.

Improvement Measure I-TR-87 Provide Pedestrian/Bicycle Improvements

CPMC should implement improvement measures to minimize conflicts between vehicles, bicyclists, and pedestrians at the Cesar Chavez Street passenger loading/unloading zone, including: warning signs and colored bicycle lane treatment to alert drivers to the presence of bicyclists and bicycle lanes, and management of the passenger loading/unloading zone during peak periods of activity (e.g., between 10 a.m. and 4 p.m.).

As an improvement measure to minimize conflicts between vehicles exiting the proposed garages and pedestrians and bicyclists on Valencia Street and Cesar Chavez Street, CPMC should install flashing lights and audible signals to provide indications when a vehicle is exiting the garage.

IMPACT TR-88

Implementation of the St. Luke's Campus project would not result in substantial overcrowding on public sidewalks, create hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the project site or adjoining areas. (Less than Significant)

The St. Luke's Campus project would result in an increase in pedestrian activity in the vicinity of the campus, including walk trips to and from the proposed uses, plus walk trips to and from Muni bus stops and 24th Street BART Station. Overall, during the p.m. peak hour the project would add about 64 net-new pedestrian trips (an increase of 25 walk trips, and 39 net-new trips that account for walk trips to and from the transit stops) to the surrounding streets (see Table 4.5-11, page 4.5-77).

The new pedestrian trips generated by the St. Luke's Campus project could be accommodated on nearby sidewalks without substantially affecting pedestrian conditions. The primary pedestrian entrances would be from the new pedestrian plaza south of Cesar Chavez Street for the St. Luke's Replacement Hospital, from the new pedestrian plaza or directly from Cesar Chavez Street for the MOB/Expansion Building and from Valencia Street for the existing 1580 Valencia Street building. Existing pedestrian conditions on sidewalks and crosswalks were observed to be acceptable, with adequate space to accommodate additional pedestrians. The net-new pedestrian trips would not result in substantial overcrowding on the sidewalks or hazardous conditions, and while the proposed garage with access from Valencia Street would result in increased vehicle/pedestrian/bicycle conflicts, it would not result in unsafe conditions for pedestrians. Therefore, **the St. Luke's Campus project impact on pedestrians would be less than significant**.

Although pedestrian impacts would be less than significant, implementation of Improvement Measure I-TR-88 below would further reduce less-than-significant impacts by requiring pedestrian crosswalks at the unsignalized intersection of San Jose/27th Street.

Improvement Measure I-TR-88 Install Pedestrian Crosswalks

As an improvement measure to facilitate pedestrian movements, SFMTA shall install pedestrian crosswalks at the unsignalized intersection of San Jose/27th Street.

IMPACT TR-89 *Implementation of the St. Luke's Campus would not result in a loading demand during the peak hours of loading activities that could not be accommodated within the proposed loading supply, or within on-street loading zones, and would not create potentially hazardous conditions. (Less than Significant)*

At buildout of the St. Luke's Campus, a total of five on-site loading spaces would be provided including the two existing spaces serving the Hartzell Building (555 San Jose Avenue) and three new spaces in the loading dock under the proposed Replacement Hospital. The three new loading spaces would be accessed from Cesar Chavez Street, and would accommodate trucks up to 35 feet in length. Existing off-street loading areas within the existing staff parking lot and the loading dock behind existing St. Luke's Hospital Tower would be removed. The on-street commercial vehicle loading/unloading zone on Valencia Street would remain. Figure 4.5-26, "St Luke's Campus—Proposed Passenger Zones" (page 4.5-207), presents the location of the passenger loading/unloading zones.

As indicated in Table 4.5-27 (page 4.5-217), the St. Luke's project would generate a demand for five service vehicle and truck loading/unloading spaces during the peak hour of loading activities. With implementation of the truck management plan that would be proposed as part of the CPMC LRDP project, the length of incoming trucks at the St. Luke's campus would be restricted to 35 feet in length. In addition, the truck management plan would specify that all truck maneuvering would be within the loading dock, without blocking the sidewalk or parking lanes on Cesar Chavez Street. Because there would be a total of five on-site and off-street loading/unloading spaces, the peak loading demand would be accommodated, and the **loading impact would be less than significant**.

IMPACT TR-90 *Implementation of the St. Luke's Campus Alternate Emergency Department Location Variant would not result in a loading demand during the peak hours of loading activities that could not be accommodated within the proposed loading supply or within on-street loading zones, and the variant would not create potentially hazardous conditions. (Less than Significant)*

Under the Alternate Emergency Department Location Variant, the loading dock containing three loading spaces for the St. Luke's Replacement Hospital would be relocated from Cesar Chavez Street to 27th Street. With the relocation, the three proposed spaces would be maintained and, therefore, as described in Impact TR-89, the loading demand would be accommodated within the proposed supply. The Alternate Emergency Department Location Variant-related impacts on loading operations would be less than significant.

IMPACT TR-91 *Implementation of the St. Luke's Campus project would not result in a passenger loading/unloading demand that could not be accommodated within the existing and proposed passenger loading/unloading zones, and would not create potentially hazardous conditions. (Less than Significant)*

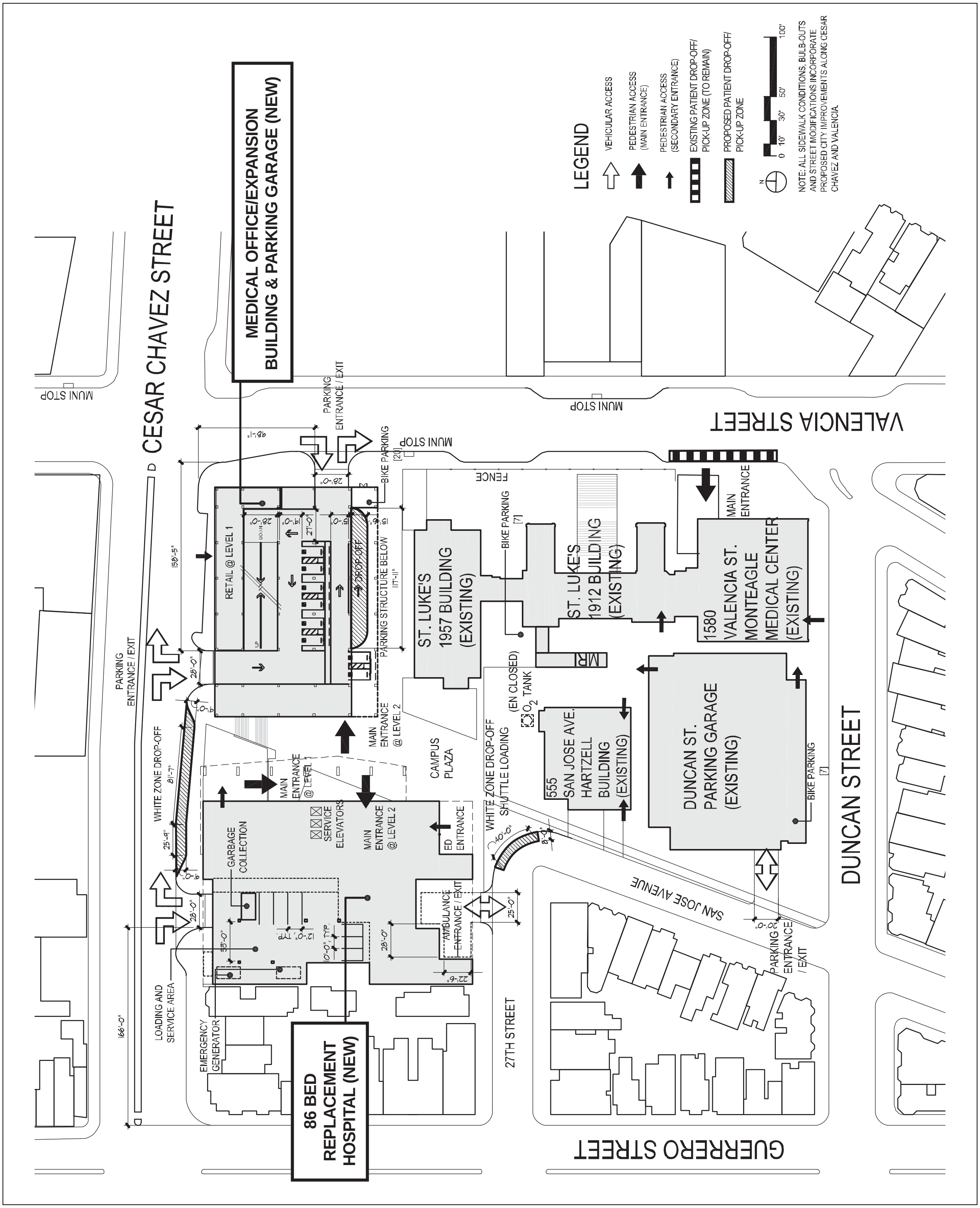
The St. Luke's Campus project would provide about 198 feet of curbside passenger loading/unloading zones on Cesar Chavez Street and Valencia Street, 40 feet of curbside on the north side of 27th Street at San Jose Avenue, and 112 feet within the garage under the new MOB/Expansion Building. Together, these three zones would provide approximately 310 feet of passenger loading/unloading for visitors and patients (see Figure 4.5-26, page 4.5-207). As indicated in Table 4.5-28 (page 4.5-218), the projected peak demand for existing and proposed facilities of about 253 feet of passenger loading/unloading activity would be accommodated within the existing and proposed supply of 350 feet. Therefore, the **impact on passenger loading/unloading activity for the proposed St. Luke's project would be less than significant**.

IMPACT TR-92 *Implementation of the St. Luke's Campus project would not result in a significant emergency vehicle access impact. (Less than Significant)*

The existing emergency vehicle access near the intersection of San Jose Avenue and 27th Street would be maintained while the proposed St. Luke's Replacement Hospital is under construction. New emergency vehicle access would be provided for the Replacement Hospital on 27th Street between Guerrero Street and San Jose Avenue. Therefore, the **impact related to emergency vehicle access would be less than significant**.

IMPACT TR-93 *Implementation of the St. Luke's Campus project Alternate Emergency Department Location Variant would not result in a significant emergency vehicle access impact. (Less than Significant)*

Under the Alternate Emergency Department Location Variant, the Emergency Department and ambulance bay would be relocated from the south side of the proposed Replacement Hospital near the intersection of San Jose and 27th Street, to the north side of the hospital on Cesar Chavez Street. The Alternate Emergency Department Location Variant would provide for new emergency vehicle access for the Replacement Hospital, and therefore, the **impact related to emergency vehicle access would be less than significant**.



Source: Data compiled by SmithGroup/Boulder Associates in 2010

St. Luke's Campus—Proposed Passenger Zones **Figure 4.5-26**

IMPACT TR-94 *Implementation of construction-related activities on the St. Luke's Campus would not cause a significant impact because of their temporary and limited duration. (Less than Significant)*

Construction of the proposed project would be phased between 2011 and 2019, starting with the proposed Replacement Hospital on the northwest quadrant of the campus, followed by the demolition of the existing hospital tower and the new construction of the proposed MOB/Expansion Building at the northeast quadrant. CPMC expects to occupy the proposed Replacement Hospital by 2015 and the MOB Expansion Building by about 2019. During construction of the Replacement Hospital, the existing St. Luke's Hospital Tower and other support buildings would remain operational.

As described in the preliminary construction management plans (see the description of projects at St. Luke's in Section 2.6 of Chapter 2, "Project Description"), construction activities would require temporary closure of portions of the sidewalks located adjacent to the construction site. As part of the St. Luke's Campus project, San Jose Avenue between Cesar Chavez Street and 27th Street would be abandoned. During construction of the proposed Replacement Hospital, the south side of Cesar Chavez Street and the north side of 27th Street adjacent to the project site would be closed and pedestrians would be directed to use the sidewalk on the opposite site of the street. During construction of the proposed MOB/Expansion Building, portions of the sidewalk on Cesar Chavez Street and on Valencia Street adjacent to the project site would be closed to pedestrians, subject to City approval.

Construction staging would occur on-site. Throughout the construction period, there would be a flow of construction-related trucks into and out of the site. The impact of construction traffic would be a temporary lessening of the capacities of the streets immediately adjacent to the construction areas that front on Cesar Chavez Street, Valencia Street and San Jose Avenue. The reduced capacity would be due to the slower movement and larger turning radii of the trucks, which may affect both traffic and transit operations. It is anticipated that the majority of the construction-related truck traffic would use I-80/U.S. 101 to access the project site from the East Bay and South Bay via Cesar Chavez Street. Access to the South Bay would also be via San Jose Avenue and I-280. During construction of the Replacement Hospital, trucks would enter the project site from construction access gates on 27th Street, San Jose Avenue, and Cesar Chavez Street. During construction of the new MOB/Expansion, trucks would enter the project site from construction access gates on Valencia Street and Cesar Chavez Street.

The trip generation, distribution, and mode split of construction workers are not known. However, it is anticipated that the addition of the worker-related vehicle or transit trips would not substantially affect transportation conditions, as any impacts on local intersections or the transit network would be similar to, or less than, those associated with the proposed project.

Employee and construction worker parking during the construction of the proposed Replacement Hospital, demolition of the existing hospital tower, and proposed construction of the MOB/Expansion Building would vary based on the stage of the project. Carpooling and utilizing public transportation would be encouraged throughout the construction to reduce the parking demand. During the utility realignment phase, the existing physician surface parking lot and the abandoned portion of San Jose Avenue would be used for construction worker parking and staging area. During the excavation, foundation, structural, exterior finish, interior and demolition stages existing off-site public parking garages and lots would be utilized. Specific locations of these off-site facilities have not been identified by CPMC. A shuttle service would be provided between the St. Luke's construction site and the off-site public parking garages and lots.

Construction truck trips would temporarily increase pedestrian/bike conflicts on Cesar Chavez Street, Valencia Street, and San Jose Avenue. Temporary detours may be required and traffic control personnel would be used to control traffic entering and exiting construction gates in order to reduce the potential of conflicts between construction vehicles and pedestrians and bicyclists.

At this time it is not anticipated that any travel lane closures would be required for building construction. However, deliveries during the construction of the Replacement Hospital may result in congestion on 27th Street between Guerrero Street and San Jose Avenue. Deliveries would be scheduled and coordinated to not hinder emergency vehicle access to the existing hospital. Utility relocation from San Jose Avenue between 27th Street and Cesar Chavez Street, to Cesar Chavez Street, Guerrero Street, and/or Valencia Street may require temporary travel lane and sidewalk closures, and may affect bus routes on Cesar Chavez Street and Valencia Street. Project construction activities affecting Cesar Chavez Street and Valencia Street may overlap with proposed implementation of bicycle lanes on Cesar Chavez Street, as well streetscape improvements along Cesar Chavez Street and Valencia Street. Temporary sidewalk and travel lane closures as a part of construction activity are subject to review and approval by the DPW, SFMTA, and TASC, and construction activities overlapping with other City projects would be coordinated. Overall, the proposed construction at the St. Luke's Campus would not substantially affect traffic, transit, pedestrian and bicycle circulation, and any potential impacts that would occur would not be considered significant due to their temporary and limited duration. Therefore, **construction impacts associated with the proposed LRDP on the St. Luke's Campus would be less than significant**.

Parking Discussion

San Francisco does not consider parking supply as part of the permanent physical environment and, therefore, does not consider changes in parking conditions to be environmental impacts as defined by CEQA. The San

Francisco Planning Department acknowledges, however, that parking conditions may be of interest to the public and the decision-makers. Therefore, a parking analysis and discussion for the proposed LRDP is presented for information purposes.

Parking conditions are not static because parking supply and demand vary from day to day, from day to night, and from month to month. The availability or lack of parking spaces is not a permanent physical condition but changes over time whenever people change their modes and patterns of travel. Parking deficits are considered to be social effects, rather than impacts on the physical environment as defined by CEQA. Under CEQA, a project's social impacts need not be treated as significant impacts on the environment. Environmental documents should, however, address the secondary physical impacts that could be triggered by a social impact (State CEQA Guidelines, Section 15131[a]). The social inconvenience of parking deficits, such as having to hunt for scarce parking spaces, is not an environmental impact, but there may be secondary physical environmental impacts, such as increased traffic congestion at intersections, air quality impacts, safety impacts, or noise impacts caused by congestion. In the experience of San Francisco transportation planners, however, the absence of a ready supply of parking spaces, combined with available alternatives to auto travel (e.g., transit service, taxis, bicycles or travel by foot) and a relatively dense pattern of urban development, induces many drivers to seek and find alternative parking facilities, shift to other modes of travel, or change their overall travel habits. Any such resulting shifts to transit service in particular, would be in keeping with the City's Transit-First Policy (Charter Article 8A, Section 8A.115). This policy provides that "parking policies for areas well served by public transit shall be designed to encourage travel by public transportation and alternative transportation."

The transportation analysis accounted for potential secondary effects, such as cars circling and looking for a parking space in areas of limited parking supply, assuming that all drivers would attempt to find parking at or near the project site and then seek parking farther away if more convenient parking was unavailable. Moreover, the analysis took into account that the secondary effects of drivers searching for parking is typically offset by a reduction in vehicle trips due to others who are aware of constrained parking conditions in a given area. Any secondary environmental impacts that might result from a shortfall in parking in the vicinity of the proposed project would be minor, and the traffic assignments used in the transportation analysis, as well as in the associated air quality, noise and pedestrian safety analyses, reasonably addresses potential secondary effects.

In summary, changes in parking conditions are considered to be social impacts rather than impacts on the physical environment. Accordingly, the following parking analysis is presented for informational purposes only.

The St. Luke's Campus currently contains 329 off-street parking spaces, including 215 parking spaces in the Duncan Street Garage, and 114 spaces in the existing surface lots and reserved on-street spaces. With implementation of the CPMC LRDP, a new parking structure containing 220 spaces would be constructed under the proposed MOB/Expansion Building. At buildout of the St. Luke's Campus, a total of 450 parking spaces would be provided. The proposed project would seek an exception to the Planning Code requirements for the number of parking spaces as part of the PUD approval for the project. In addition, the proposed project would meet Planning Code requirements for the number of handicapped-accessible parking spaces, bicycle parking spaces, and car share spaces. In addition, to facilitate traffic flow within the garages and reduce around the block movements, CPMC would install electronic "FULL" signs near all garage entrances, and directional signage within the new MOB garage directing drivers to use the Cesar Chavez Street exit for access to U.S. 101.

Table 4.5-34 (page 4.5-164) presents a comparison of the proposed supply to the estimated parking demand. At buildout, there would be a peak parking demand of about 759 spaces, compared with a total supply of 450 spaces. Overall there would be a parking shortfall of 309 spaces, including 172 spaces for employees, and 137 spaces for patients and visitors. It is anticipated that short-term visitors to the campus unable to find parking on the campus would likely park in any available on-street parking space around the campus, although some may also choose to take transit, bicycle or walk instead of drive. On-street parking adjacent to the project site is currently well-utilized, with parking occupancy ranging between 80 and 100 percent between 1 and 5 p.m., and about 70 percent occupied at 8 p.m. Employees unable to park at the campus would take transit, bicycle or walk to the campus, or park in one of CPMC's off-site parking facilities. Employees who chose to park in off-site facilities may increase the demand for CPMC shuttle services.

◆ Multiple Campus Impacts

The combined impacts associated with multiple campuses under CPMC LRDP are presented below. The following are the topics addressed and the impacts analyzed for those topics:

- *Traffic:* Impact TR-95
- *Transit:* Impact TR-96
- *Shuttle service:* Impact TR-97
- *Construction:* Impact TR-98

IMPACT TR-95 *Implementation of the Cathedral Hill Campus, Pacific Campus, and Davies Campus projects would have less-than-significant combined impact at the study intersection of Octavia/Market/U.S. 101. (Less than Significant)*

The contribution of vehicle trips associated with each campus was reviewed at intersections operating at unacceptable levels of service (i.e., LOS E or LOS F), and it was determined that the CPMC LRDP project would have a potential multiple campus impact only at the intersection of Octavia/Market/U.S. 101. Development at the

Cathedral Hill, Pacific and Davies campuses would add traffic to the intersection of Octavia/Market/U.S. 101 that would operate at unacceptable levels of service under future year 2015 or 2020 Modified Baseline No Project and 2030 Cumulative No Project conditions. Impact TR-3 for the Cathedral Hill Campus, Impact TR-59 for the Pacific Campus, and Impact TR-74 for the Davies Campus identified that each individual campus project would not result in substantial contributions to the critical movements at this intersection, and therefore, the project-specific contributions to either 2015 or 2020 Modified Baseline plus Project impacts would not be significant. To determine whether the impact of the combined traffic from the three campuses at buildout of the LRDP would represent a significant impact, the combined traffic volumes at the critical movements were examined for p.m. peak-hour 2030 Cumulative conditions when construction at all three campuses would be completed. Based on this analysis, it was determined that the traffic volume contribution would not be significant, and that the three projects, in combination, would not have a significant contribution to the intersections unacceptable operating conditions. Therefore, **the combined impact of multiple campus projects on intersection operations at Octavia/Market/U.S. 101 would be less than significant**.

IMPACT TR-96 *Implementation of the CPMC LRDP combined project transit demand would not exceed the proposed transit system capacity at the study area corridors. (Less than Significant)*

Impact TR-27 for the Cathedral Hill Campus, Impact TR-60 for the Pacific Campus, Impact TR-68 for the California Campus, Impact TR-77 for the Davies Campus, and Impact TR-86 for the St. Luke's Campus examined the impact of the increase in transit ridership generated by the net-new uses at each campus on the capacity that would be available at the Muni corridors. Since a number of Muni lines serve more than one campus (e.g., the 38-Geary serves the Cathedral Hill, Pacific and California campuses, while the 12-Folsom-Pacific serves the Cathedral Hill, Pacific and St. Luke's campuses) the potential exists that the combined ridership demand may result in corridor capacity utilization exceeding the 85 percent standard. To determine whether the impact of the combined CPMC passenger demand would represent a significant impact, the combined passenger demand at each corridor was examined for the p.m. peak-hour 2030 Cumulative conditions when the CPMC LRDP would be at full build-out and operational. Based on this assessment, the capacity utilization at the corridors for each campus would remain at less than 85 percent, and therefore, **the combined impact of all five campuses on Muni corridors would be less than significant**.

IMPACT TR-97 *Implementation of the CPMC LRDP would impact the ridership demand for CPMC shuttles, which would be accommodated within the proposed shuttle service. (Less than Significant)*

The CPMC LRDP includes a reconfiguration of the CPMC shuttle service with the central focus being the new Cathedral Hill Campus. As described in Analytic Approach section above, the CPMC shuttle program includes seven CPMC lines. In addition, non-CPMC shuttles could be provided by private operators to facilitate access to off-site parking facilities for CPMC employees. Table 4.5-40, "Daily CPMC Shuttle Demand and Capacity Utilization" below, presents a comparison of the estimated future shuttle demand to the estimated capacity for the various shuttle lines. As indicated in the table, the proposed shuttle service would accommodate the demand. CPMC would enter into long-term leases with off-site parking facilities that could include the provision of shuttle service to CPMC campuses, and therefore, the provision of the non-CPMC shuttle service could be in place to serve the projected off-site demand. Therefore, **the estimated future shuttle capacity would meet the projected demand, and the impact related to shuttle service would be less than significant**.

IMPACT TR-98 *Implementation of the CPMC LRDP with overlapping construction activities at the five campuses would not result in a significant construction impact. (Less than Significant)*

Construction activities associated with implementation of the CPMC LRDP would occur on four of the five campuses between 2011 and 2019; under the CPMC LRDP there would not be any construction activities at the existing California Campus. The impacts of construction activities may be compounded if two or more campuses in relatively close proximity have concurrent construction activities. Compound impacts may include increased truck traffic on shared access routes, transit impacts, and sidewalk closures.

The Davies Campus and the St. Luke's Campus are in relative isolation from the Pacific Campus and the Cathedral Hill Campus, and would rely on different access routes for construction vehicle access. It is unlikely that construction at either of these campuses would compound the construction impacts associated with the Cathedral Hill Campus project or the Pacific Campus project. The Pacific Campus and the Cathedral Hill Campus are in relatively close proximity and would share some of the same construction vehicle access routes such as Geary Street and Van Ness Avenue. However, the construction schedules of work at these two campuses would not overlap; namely, the construction at the Pacific Campus would not begin until construction at the Cathedral Hill Campus is completed. Neither campus would share construction staging areas or have concurrent sidewalk or travel lane closures. Therefore, **the impact of overlapping construction activities for the CPMC LRDP would be less than significant**.

Although impacts of overlapping construction impacts activities with the CPMC LRDP project would be less than significant, implementation of Mitigation Measure MM-TR-55 described above for significant and unavoidable

Table 4.5-40
Daily CPMC Shuttle Demand and Capacity Utilization

CPMC Shuttle Line	Existing Daily Passenger Demand	Estimated Future Daily Passenger Demand[7]	Estimated Future Daily Shuttle Capacity[9]	Estimated Future Shuttle Capacity Utilization[10]
Cathedral Hill–Civic Center BART[1]	–	4,028	6,720	60%
Cathedral Hill–Pacific/Japantown/BART (CH-Line) [2]	172	1,756–2,004	3,360	52%–60%
Cathedral Hill–St. Luke's/24th Street BART[3]	–	270	672	40%
Cathedral Hill–Davies	–	212–317	672	32%–47%
Cathedral Hill–Folsom/Caltrain	–	150[8]	672	22%
Pacific–Davies (D-Line)	423	106–212	672	16%–32%
St. Luke's–Davies/24th Street BART (SL-Line)[4]	30	270	672	40%
Non-CPMC Private Shuttle Operators[5]	–	750	–	–
California–Pacific (C-Line)[6]	496	–	–	–
BART–Van Ness (BV-Line)	503	–	–	–
Japantown Center–Pacific (JC-Line)	381	–	–	–
Total	2,005	7,542–8,001	13,440	56%–60%

Notes:
1 Assumes that 100 percent of daily transit trips between the Cathedral Hill Campus and the East Bay, South Bay and Superdistrict 4 use this shuttle to access Civic Center BART/Muni Station.
2 Assumes that 50 percent of daily transit trips from Superdistrict 3, 100 percent of daily transit trips from the South Bay, 75 percent of daily transit trips from Superdistrict 4, and 100 percent of daily transit trips from the East Bay use this shuttle to access Civic Center BART/Muni Station.
3 Assumes that 50 percent of daily transit trips between the St. Luke's Campus and the 24th BART station use this line. These trips are composed of 38 percent of the daily transit trips from Superdistrict 1, the East Bay and the South Bay, and 12 percent of daily trips from Superdistrict 3 use this route. Persons travelling between St. Luke's Campus and Cathedral Hill Campus may be fewer.
4 Assumes that 50 percent of daily transit trips between the St. Luke's Campus and the 24th BART station use this line. These trips are composed of 37 percent of the daily transit trips from Superdistrict 1, the East Bay and the South Bay, and 12 percent of daily trips from Superdistrict 3 use this route. Persons travelling between St. Luke's Campus and Davies Campus may be fewer.
5 Assumes that 205 of St. Luke's staff and 170 of Davies staff park in other off-site parking garages.
6 Includes the GMG Line between California Campus and Geary Mall Garage.
7 Assumes that between 50 and 75 percent of all existing shuttle trips between Pacific Campus and other Campuses (Davies, California, Cathedral Hill) transfer to Cathedral Hill shuttle routes.
8 Assumes that approximately 10 percent of transit trips between the South Bay and Cathedral Hill Campus use Caltrain.
9 Assumes that all routes are served by 14-passenger shuttles, except for the 12th Street Garage shuttle, which would be operated by a private operator. All shuttles were assumed to operate 12 hours per day (roughly 6 a.m. to 6 p.m., except for the Cathedral Hill-Folsom/Caltrain, which would operate only during the peak periods.
10 Excludes capacity that would be provided by non-CPMC private shuttle operators.
Source: Data provided by CPMC and compiled by Fehr & Peers in 2010

impacts related to the construction of the Cathedral Hill Campus would ensure that potential overlap of construction impacts would not occur. Mitigation Measure MM-TR-55 would require coordination of construction activities between CPMC campuses having concurrent construction schedules. For example, deliveries of materials could be coordinated to reduce the total number of delivery trips on city streets.

4.5.5 CUMULATIVE IMPACTS

Cumulative impacts of the LRDP are presented below. The following are the topics addressed and the impacts analyzed for those topics:

- *Traffic:* Impacts TR-99 through TR-131
- *Transit:* Impacts TR-132 through TR-147
- *Construction:* Impacts TR-148 through TR-152

◆ Cathedral Hill Campus

Overview of Cumulative Traffic Impacts at the proposed Cathedral Hill Campus

The proposed Cathedral Hill Campus project would generate new vehicle trips and increase the number of vehicle and average delay per vehicle at the 26 study intersections during both the a.m. and p.m. peak hours. The proposed project would result in significant and unavoidable impacts at the intersections of Van Ness/Market, Polk/Geary, and Van Ness/Pine and feasible mitigation measures have not been identified. At eight intersections that would operate poorly under 2030 Cumulative No Project and 2030 Cumulative plus Project conditions, the project contributions to the poor operating conditions would be less than significant (Gough/Geary, Franklin/O’Farrell, Franklin/Sutter, Franklin/Bush, Eighth/Market, Van Ness/Fell, Van Ness/Geary, and Octavia/Market/U.S. 101). Fifteen of the 26 study intersections would continue to operate at acceptable levels of LOS D or better under 2030 Cumulative plus Project conditions (Gough/Post, Gough/Sutter, Franklin/Geary, Franklin/Post, Franklin/Pine, Van Ness/Hayes, Van Ness/O’Farrell, Van Ness/Post, Van Ness/Sutter, Van Ness/Bush, Van Ness/Broadway, Polk/O’Farrell, Polk/Cedar, Polk/Post, and Polk/Sutter).

The MOB Access Variant would result in the same impacts as under the proposed LRDP, except that it would result in a traffic hazard impact (see Impact TR-17 on page 4.5-110) at the proposed MOB’s driveway onto Geary Street. Mitigation Measure MM-TR-17 would reduce but not eliminate this significant and unavoidable impact. Under the Two-Way Post Street Variant, conditions would be similar to the proposed LRDP, with the exception that the variant would result in a significant and unavoidable impact at two additional intersections (Gough/Geary and Franklin/Bush; see Impact TR-104 on page 4.5-221 and TR-106 on page 4.5-222, respectively).

IMPACT TR-99 *Implementation of the Cathedral Hill Campus project would result in significant project and cumulative impacts at the intersection of Van Ness/Market. (Significant and Unavoidable)*

The Cathedral Hill Campus project was determined to have a significant impact at an intersection if project-generated trips would cause an intersection operating at LOS D or better under the 2030 Cumulative No Project condition to operate at LOS E or LOS F, or intersection operating at LOS E under the 2030 Cumulative No Project Condition to deteriorate to LOS F conditions. At intersections that would operate at LOS E or LOS F under the 2030 Cumulative No Project condition, and would continue to operate at LOS E or LOS F under 2030 Cumulative plus Project conditions, the increase in project vehicle trips were reviewed to determine whether the increase would contribute considerably to critical movements operating at LOS E or LOS F. In addition, if the project results in a significant project impact under Modified Baseline conditions, it would also be considered to have a significant contribution to cumulative impacts. Table 4.5-17 (page 4.5-94) and Table 4.5-18 (page 4.5-95) present the intersection LOS conditions for the 26 study intersections in the vicinity of the Cathedral Hill Campus, for the a.m. and p.m. peak hours, respectively. Figure 4.5-27, “Cathedral Hill Campus—Intersection Level of Service, A.M. Peak Hour” (page 4.5-217), and Figure 4.5-28, “Intersection Level of Service, P.M. Peak Hour” (page 4.5-218), illustrate the locations of study intersections operating at LOS E or LOS F under 2030 Cumulative plus Project conditions.

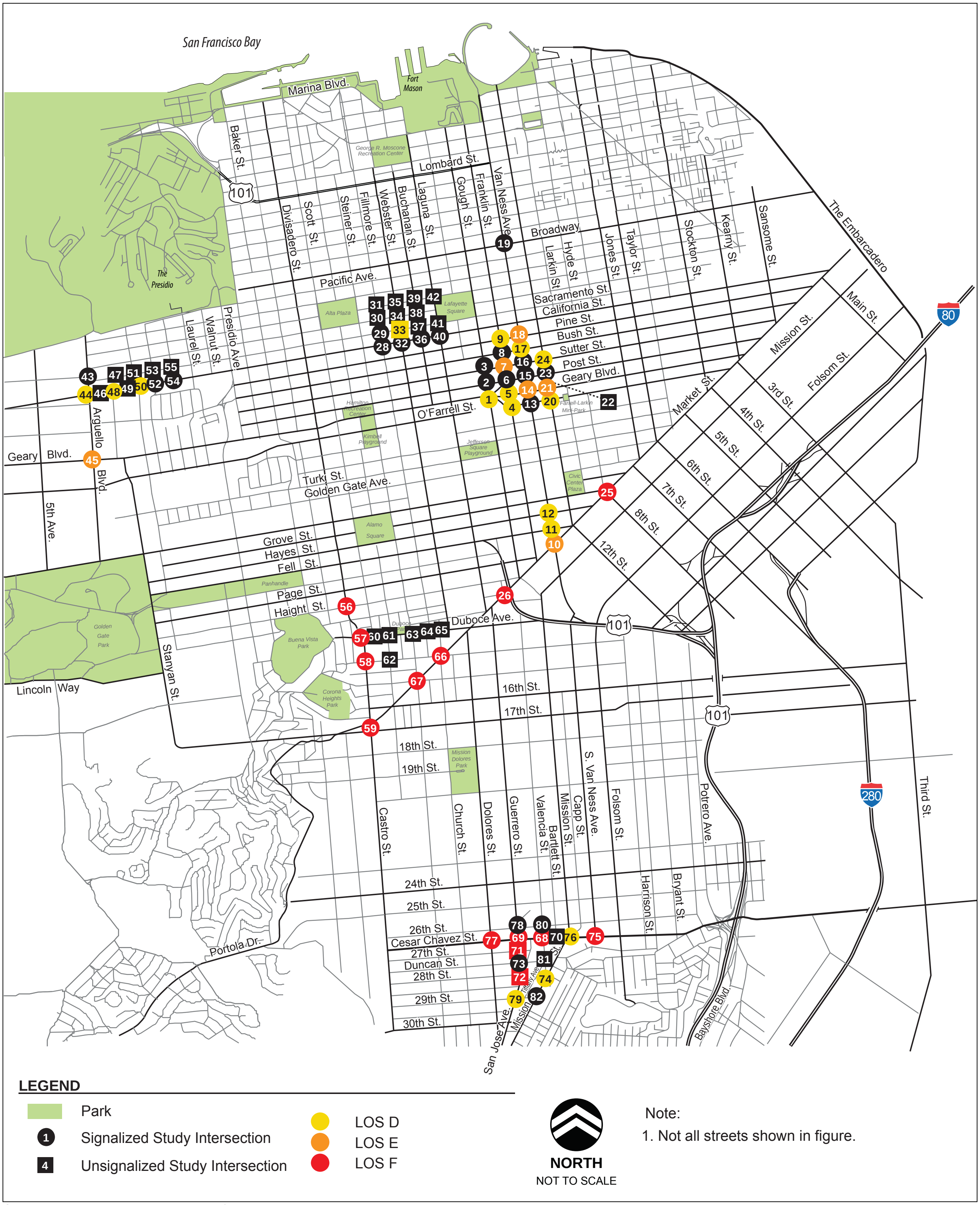
During the p.m. peak hour, **the Cathedral Hill Campus project would result in a significant impact under 2015 Modified Baseline plus Project Conditions at Van Ness/Market. This would be considered a significant cumulative traffic impact**.

Providing additional traffic lanes or otherwise increasing vehicular capacity at this intersection is not feasible because it would require narrowing of sidewalks to deficient widths and/or demolition of buildings adjacent to these streets. Signal timing adjustments may improve intersection operations, but would likely be infeasible due to traffic, transit or pedestrian signal timing requirements. Therefore, no feasible mitigation measures have been identified to reduce cumulative project impacts to less-than-significant levels. CPMC has indicated that it is planning on expanding its current TDM program to attempt to decrease trips by private automobile; and although this may reduce the number of trips through this location, the extent of this program or reduction in automobiles or trips is not known. **The traffic impact at the intersection of Van Ness/Market would, therefore, remain significant and unavoidable.**

Source: Data compiled by Fehr & Peers in 2010

Cathedral Hill Campus—2030 Cumulative plus Project Conditions—Intersection Level of Service, A.M. Peak Hour

Figure 4.5-27



Source: Data compiled by Fehr & Peers in 2010

**2030 Cumulative plus Project Conditions—
Intersection Level of Service, P.M. Peak Hour**

Figure 4.5-28

IMPACT TR-100 *Implementation of the Cathedral Hill Campus project would result in significant project and cumulative impacts at the intersection of Van Ness/Pine. (Significant and Unavoidable)*

During the p.m. peak hour, the addition of the proposed project trips would degrade operations at the signalized intersection of Van Ness/Pine from LOS D under 2030 Cumulative No Project conditions, to LOS E under 2030 Cumulative plus Project conditions. **This would be considered a significant traffic impact.**Providing additional traffic lanes or otherwise increasing vehicular capacity at this intersection is not feasible because it would require narrowing of sidewalks to deficient widths, and/or demolition of adjacent buildings. Signal timing adjustments may improve intersection operations but would likely be infeasible because of traffic, transit, or pedestrian signal timing requirements. CPMC has indicated that it is planning on expanding its current TDM program to attempt to decrease trips by private automobile; although this may reduce the number of trips through this location, the extent of this program or potential reduction is not known. Therefore, no feasible mitigation measures have been identified to reduce project impacts to less-than-significant levels. **The traffic impacts at the intersection of Van Ness/Pine would remain significant and unavoidable**.

IMPACT TR-101 *Implementation of the Cathedral Hill Campus project would result in significant project and cumulative impacts at the intersection of Polk/Geary. (Significant and Unavoidable)*

During the p.m. peak hour, the addition of the proposed project trips would degrade operations at the signalized intersection of Polk/Geary from LOS D under 2030 Cumulative No Project conditions, to LOS E under 2030 Cumulative plus Project conditions. In addition, the proposed project would result in a significant impact under 2015 Modified Baseline plus Project Conditions. **This would be considered a significant traffic impact.**

Providing additional traffic lanes or otherwise increasing vehicular capacity at this intersection is not feasible because it would require narrowing of sidewalks to deficient widths, and/or demolition of adjacent buildings. Signal timing adjustments may improve intersection operations, but would likely be infeasible due to traffic, transit or pedestrian signal timing requirements. CPMC has indicated that it is planning on expanding its current TDM program to attempt to decrease trips by private automobile; and although this may reduce the number of trips through this location, the extent of this program or potential reduction is not known. Therefore, no feasible mitigation measures have been identified to reduce project impacts to less-than-significant levels. **The traffic impacts at the intersection of Polk/Geary would remain significant and unavoidable.**

IMPACT TR-102 *Implementation of the Cathedral Hill Campus project would have less-than-significant impacts at eight study intersections that would operate at LOS E or LOS F under 2030 Cumulative No Project conditions. (Less than Significant)*

As indicated in Table 4.5-17 (page 4.5-94) and Table 4.5-18 (page 4.5-95), the intersection LOS for eight of the 26 study intersections would operate at LOS E or LOS F under both 2030 Cumulative No Project conditions, and would continue to operate at the same LOS under 2030 Cumulative plus Project conditions. The eight intersections include:

- Gough/Geary
- Franklin/O'Farrell
- Franklin/Sutter
- Franklin/Bush
- Van Ness/Fell
- Van Ness/Geary
- Eighth/Market
- Octavia/Market/U.S. 101

At these eight intersections that would operate at LOS E or LOS F under 2030 Cumulative No Project conditions, and would continue to operate at LOS E or LOS F under 2030 Cumulative plus Project conditions, the increase in vehicle trips generated by the project was reviewed to determine whether the project's increase would contribute considerably to critical movements operating at LOS E or LOS F at these intersections. Based on this examination, the project's contributions at these intersections were determined to be less than significant. The poor operating conditions at these study intersections would be due to traffic volume increases associated with other developments in the project vicinity. Since the Cathedral Hill Campus project would not contribute significantly to the poor operating conditions, **project-related impacts would be less than significant**.

IMPACT TR-103 *Implementation of the Cathedral Hill Campus project would have less-than-significant impacts at 17 study intersections that would operate at LOS D or better under 2030 Cumulative plus Project conditions. (Less than Significant)*

With implementation of the Cathedral Hill Campus project, the following 17 study intersections would continue to operate at LOS D or better during the a.m. and p.m. peak hours, **and therefore, traffic impacts at these locations would be less than significant:**

- Gough/Post
- Gough/Sutter
- Franklin/Geary
- Franklin/Post
- Franklin/Pine
- Van Ness/Fell
- Van Ness/Hayes
- Van Ness/O'Farrell
- Van Ness/Geary
- Van Ness/Post

- Van Ness/Sutter
- Van Ness/Bush
- Van Ness/Broadway
- Polk/O'Farrell
- Polk/Cedar
- Polk/Post
- Polk/Sutter

IMPACT TR-104 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would result in significant project and cumulative impacts at the intersection of Gough/Geary. (Significant and Unavoidable)*

Table 4.5-19 (page 4.5-103) and Table 4.5-20 (page 4.5-104) present the intersection LOS conditions for the 26 study intersections for the Two-Way Post Street Variant, for a.m. and p.m. peak hours, respectively. During the p.m. peak hour, the addition of the proposed project trips would degrade operations at the signalized intersection of Gough/Geary from LOS D under 2030 Cumulative No Project conditions, to LOS E under 2030 Cumulative plus Two-Way Post Street Variant conditions. **This would be considered a significant traffic impact.**

Providing additional traffic lanes or otherwise increasing vehicular capacity at this intersection is not feasible because it would require narrowing of sidewalks to deficient widths and/or demolition of buildings adjacent to these streets. Signal timing adjustments may improve intersection operations, but would likely be infeasible because of traffic, transit, or pedestrian signal timing requirements. Therefore, no feasible mitigation measures have been identified to reduce cumulative project impacts to less-than-significant levels. CPMC has indicated that it is planning on expanding its current TDM program to attempt to decrease trips by private automobile; although this may reduce the number of trips through this location, the extent of this program or reduction in automobiles or trips is not known. **The Two-Way Post Street Variant-related traffic impact at the intersection of Gough/Geary would, therefore, remain significant and unavoidable.**

IMPACT TR-105 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would result in significant project and cumulative impacts at the intersection of Van Ness/Market. (Significant and Unavoidable)*

As under the proposed LRDP, during the p.m. peak hour, the Two-Way Post Street Variant would result in a significant impact under 2015 Modified Baseline plus Project Conditions (refer to Impact TR-6, page 4.5-102). This would be considered a significant cumulative traffic impact.

Providing additional traffic lanes or otherwise increasing vehicular capacity at this intersection is not feasible because it would require narrowing of sidewalks to deficient widths and/or demolition of buildings adjacent to these streets. Signal timing adjustments may improve intersection operations, but would likely be infeasible because of traffic, transit, or pedestrian signal timing requirements. Therefore, no feasible mitigation measures have been identified to reduce cumulative project impacts to less-than-significant levels. CPMC has indicated that it is planning on expanding its current TDM program to attempt to decrease trips by private automobile; although this may reduce the number of trips through this location, the extent of this program or reduction in automobiles or trips is not known. **The Two-Way Post Street Variant-related traffic impact at the intersection of Van Ness/Market would, therefore, remain significant and unavoidable**.

IMPACT TR-106 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would result in significant project and cumulative impacts at the intersection of Franklin/Bush. (Significant and Unavoidable)*

During the a.m. peak hour, the Cathedral Hill Campus project Two-Way Post Street Variant would result in a significant impact under 2015 Modified Baseline plus Project Conditions (refer to Impact TR-8, page 4.5-105). **This would be considered a significant cumulative traffic impact.**

Providing additional traffic lanes or otherwise increasing vehicular capacity at this intersection is not feasible because it would require narrowing of sidewalks to deficient widths and/or demolition of buildings adjacent to these streets. Signal timing adjustments may improve intersection operations, but such adjustments would likely be infeasible because of traffic, transit, or pedestrian signal timing requirements. Therefore, no feasible mitigation measures have been identified to reduce cumulative project impacts to less-than-significant levels. CPMC is planning to expand its current TDM program to attempt to decrease trips by private automobiles; although this might reduce the number of trips through this location, the extent of this program or potential reduction in automobiles or trips is not known. **The Two-Way Post Street Variant-related traffic impact at the intersection of Franklin/Bush would, therefore, remain significant and unavoidable.**

IMPACT TR-107 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would result in significant project and cumulative impacts at the intersection of Van Ness/Pine. (Significant and Unavoidable)*

As under the proposed LRDP, during the p.m. peak hour, the addition of the proposed project trips would degrade operations at the signalized intersection of Van Ness/Pine from LOS D under 2030 Cumulative No Project conditions, to LOS E under 2030 Cumulative plus Two-Way Post Street Variant conditions. **This would be considered a significant traffic impact.**

Providing additional traffic lanes or otherwise increasing vehicular capacity at this intersection is not feasible because it would require narrowing of sidewalks to deficient widths, and/or demolition of adjacent buildings. Signal timing adjustments may improve intersection operations, but would likely be infeasible because of traffic, transit, or pedestrian signal timing requirements. CPMC has indicated that it is planning on expanding its current TDM program to attempt to decrease trips by private automobile; and although this may reduce the number of trips through this location, the extent of this program or potential reduction is not known. Therefore, no feasible mitigation measures have been identified to reduce project impacts to less-than-significant levels. **The Two-Way Post Street Variant-related traffic impacts at the intersection of Van Ness/Pine would remain significant and unavoidable.**

IMPACT TR-108 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would result in significant project and cumulative impacts at the intersection of Polk/Geary. (Significant and Unavoidable)*

As under the proposed LRDP, during the p.m. peak hour, the addition of the proposed project trips would degrade operations at the signalized intersection of Polk/Geary from LOS D under 2030 Cumulative No Project conditions, to LOS E under 2030 Cumulative plus Two-Way Post Street Variant conditions. In addition, the proposed project would result in a significant impact during the a.m. peak hour under 2015 Modified Baseline plus Two-Way Post Street Variant conditions. **This would be considered a significant traffic impact.**

Providing additional traffic lanes or otherwise increasing vehicular capacity at this intersection is not feasible because it would require narrowing of sidewalks to deficient widths, and/or demolition of adjacent buildings. Signal timing adjustments may improve intersection operations, but would likely be infeasible because of traffic, transit, or pedestrian signal timing requirements. CPMC has indicated that it is planning on expanding its current TDM program to attempt to decrease trips by private automobile; and although this may reduce the number of trips through this location, the extent of this program or potential reduction is not known. Therefore, no feasible mitigation measures have been identified to reduce project impacts to less-than-significant levels. **The Two-Way Post Street Variant-related traffic impacts at the intersection of Polk/Geary would remain significant and unavoidable.**

IMPACT TR-109 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would have less-than-significant project impacts at five study intersections that would operate at LOS E or LOS F under 2030 Cumulative No Project conditions. (Less than Significant)*

As indicated in Table 4.5-19 (page 4.5-103) and Table 4.5-20 (page 4.5-104), the intersection LOS for five of the 26 study intersections would operate at LOS E or LOS F under both 2030 Cumulative No Project conditions, and would continue to operate at the same LOS under 2030 Cumulative plus Two-Way Post Street Variant conditions. The five intersections include:

- Franklin/O'Farrell
- Franklin/Sutter
- Van Ness/Fell
- Eighth/Market
- Octavia/Market/U.S. 101

At these five intersections that would operate at LOS E or LOS F under 2030 Cumulative No Project conditions, and would continue to operate at LOS E or LOS F under 2030 Cumulative plus Project conditions, the increase in vehicle trips generated by the project was reviewed to determine whether the project's increase would contribute considerably to critical movements operating at LOS E or LOS F at these intersections. Based on this examination, the project's contributions at these intersections were determined to be less than significant. The poor operating conditions at these study intersections would be because of traffic volume increases associated with other developments in the project vicinity. Because the Cathedral Hill Campus project would not contribute significantly to the poor operating conditions, **Two-Way Post Street Variant-related impacts would be less than significant**.

IMPACT TR-110 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would have less-than-significant impacts at 16 study intersections that would operate at LOS D or better under 2030 Cumulative plus Project conditions. (Less than Significant)*

With implementation of the Cathedral Hill Campus project, the following 16 study intersections would continue to operate at LOS D or better during the a.m. and p.m. peak hours **and, therefore, traffic impacts at these locations would be less than significant:**

- Gough/Post
- Gough/Sutter
- Franklin/Geary
- Franklin/Post
- Franklin/Pine
- Van Ness/Hayes
- Van Ness/O'Farrell
- Van Ness/Geary
- Van Ness/Post
- Van Ness/Sutter
- Van Ness/Bush
- Van Ness/Broadway

- Polk/O'Farrell
- Polk/Cedar
- Polk/Post
- Polk/Sutter

IMPACT TR-111 *Implementation of the Cathedral Hill Campus project MOB Access Variant would result in significant project and cumulative impacts at the intersection of Van Ness/Market. (Significant and Unavoidable)*

Table 4.5-19 (page 4.5-103) and Table 4.5-20 (page 4.5-104) present the intersection LOS conditions for the 26 study intersections for the MOB Access Variant, for the a.m. and p.m. peak hours, respectively. As under the proposed LRDP, during the p.m. peak hour, the MOB Access Variant would result in a significant impact under 2015 Modified Baseline plus MOB Access Variant conditions. **This would be considered a significant traffic impact.**

Providing additional traffic lanes or otherwise increasing vehicular capacity at this intersection is not feasible because it would require narrowing of sidewalks to deficient widths and/or demolition of buildings adjacent to these streets. Signal timing adjustments may improve intersection operations, but would likely be infeasible because of traffic, transit, or pedestrian signal timing requirements. Therefore, no feasible mitigation measures have been identified to reduce cumulative project impacts to less-than-significant levels. CPMC has indicated that it is planning on expanding its current TDM program to attempt to decrease trips by private automobile; and although this may reduce the number of trips through this location, the extent of this program or reduction in automobiles or trips is not known. **The MOB Access Variant-related traffic impact at the intersection of Van Ness/Market would, therefore, remain significant and unavoidable.**

IMPACT TR-112 *Implementation of the Cathedral Hill Campus project MOB Access Variant would result in significant project and cumulative impacts at the intersection of Van Ness/Pine. (Significant and Unavoidable)*

As under the proposed LRDP, during the p.m. peak hour, the addition of the proposed project trips would degrade operations at the signalized intersection of Van Ness/Pine from LOS D under 2030 Cumulative No Project conditions, to LOS E under 2030 Cumulative plus MOB Access Variant conditions. **This would be considered a significant traffic impact.**

Providing additional traffic lanes or otherwise increasing vehicular capacity at this intersection is not feasible because it would require narrowing of sidewalks to deficient widths, and/or demolition of adjacent buildings. Signal timing adjustments may improve intersection operations, but would likely be infeasible because of traffic, transit, or pedestrian signal timing requirements. CPMC has indicated that it is planning on expanding its current

TDM program to attempt to decrease trips by private automobile; and although this may reduce the number of trips through this location, the extent of this program or potential reduction is not known. Therefore, no feasible mitigation measures have been identified to reduce project impacts to less-than-significant levels. **The MOB Access Variant-related traffic impacts at the intersection of Van Ness/Pine would remain significant and unavoidable.**

IMPACT TR-113 *Implementation of the Cathedral Hill Campus project MOB Access Variant would result in significant project and cumulative impacts at the intersection of Polk/Geary. (Significant and Unavoidable)*

During the p.m. peak hour, although fewer trips would proceed through the intersection of Polk/Geary, the addition of the proposed project trips would still degrade operations at this intersection from LOS D under 2030 Cumulative No Project conditions, to LOS E under 2030 Cumulative plus MOB Access Variant conditions. In addition, during the a.m. peak hour, the MOB Access Variant would result in a significant impact under 2015 Modified Baseline plus MOB Access Variant conditions. As under the proposed LRDP**, the MOB Access Variant would result in a significant traffic impact at the intersection of Polk/Geary**.

Providing additional traffic lanes or otherwise increasing vehicular capacity at this intersection is not feasible because it would require narrowing of sidewalks to deficient widths, and/or demolition of adjacent buildings. Signal timing adjustments may improve intersection operations, but would likely be infeasible because of traffic, transit, or pedestrian signal timing requirements. CPMC has indicated that it is planning on expanding its current TDM program to attempt to decrease trips by private automobile; and although this may reduce the number of trips through this location, the extent of this program or potential reduction is not known. Therefore, no feasible mitigation measures have been identified to reduce project impacts to less-than-significant levels. **The MOB Access Variant-related traffic impacts at the intersection of Polk/Geary would remain significant and unavoidable**.

IMPACT TR-114 *Implementation of the Cathedral Hill Campus project MOB Access Variant would have less-than-significant project impacts at eight study intersections that would operate at LOS E or LOS F under 2030 Cumulative No Project conditions. (Less than Significant)*

As indicated in Table 4.5-19 (page 4.5-103) and Table 4.5-20 (page 4.5-104), the intersection LOS for eight of the 26 study intersections would operate at LOS E or LOS F under both 2030 Cumulative No Project conditions, and would continue to operate at the same LOS under 2030 Cumulative plus MOB Access Variant conditions. The eight intersections include:

- Gough/Geary
- Franklin/O'Farrell
- Franklin/Sutter
- Franklin/Bush
- Van Ness/Fell
- Van Ness/Geary
- Eighth/Market
- Octavia/Market/U.S. 101

At these eight intersections that would operate at LOS E or LOS F under 2030 Cumulative No Project conditions, and would continue to operate at LOS E or LOS F under 2030 Cumulative plus Project conditions, the increase in vehicle trips generated by the project was reviewed to determine whether the project's increase would contribute considerably to critical movements operating at LOS E or LOS F at these intersections. Based on this examination, the project's contributions at these intersections were determined to be less than significant. The poor operating conditions at these study intersections would be because of traffic volume increases associated with other developments in the project vicinity. Because the Cathedral Hill Campus project would not contribute significantly to the poor operating conditions, **MOB Access Variant-related impacts would be less than significant**.

IMPACT TR-115 *Implementation of the Cathedral Hill Campus project MOB Access Variant would have less-than-significant impacts at 15 study intersections that would operate at LOS D or better under 2030 Cumulative plus Project conditions. (Less than Significant)*

With implementation of the Cathedral Hill Campus project, the following 15 study intersections would continue to operate at LOS D or better during the a.m. and p.m. peak hours **and, therefore, traffic impacts at these locations would be less than significant:**

- Gough/Post
- Gough/Sutter
- Franklin/Geary
- Franklin/Post
- Franklin/Pine
- Van Ness/Hayes
- Van Ness/O'Farrell
- Van Ness/Post
- Van Ness/Sutter
- Van Ness/Bush
- Van Ness/Broadway
- Polk/O'Farrell
- Polk/Cedar
- Polk/Post
- Polk/Sutter

IMPACT TR-116

If the proposed Van Ness Avenue and Geary Corridor Bus Rapid Transit projects are implemented, the Cathedral Hill Campus project's contribution to the combined cumulative impacts of the Cathedral Hill Campus and BRT projects at five intersections would be less than significant. (Less than Significant)

As described in Impact TR-18 (page 4.5-111), a sensitivity analysis was conducted to assess the potential combined effects of the proposed Cathedral Hill Campus project and the proposed BRT projects. This analysis was conducted at selected intersections. When the results of the analysis indicated that an intersection would operate at LOS E or LOS F with both the Cathedral Hill Campus project and the BRT projects, the Cathedral Hill Campus project contribution to the critical movements was examined to determine whether the proposed Cathedral Hill Campus project contributions would be significant.

A total of 10 study intersections were analyzed for combined project and BRT impacts assessment (Gough/Geary, Franklin/O'Farrell, Franklin/Geary, Franklin/Pine, Van Ness/Fell, Van Ness/Hayes, Van Ness/Bush, Van Ness/Pine, Van Ness/Broadway, and Polk/Sutter) for future year 2030 cumulative conditions.

The sensitivity analysis for the combined effect of the Cathedral Hill Campus project and the BRT projects indicated that five of the 10 intersections would operate at LOS D or better (Franklin/Geary, Franklin/Pine, Van Ness/Bush, Van Ness/Pine, and Polk/Sutter) and five intersections would operate at LOS E or LOS F conditions (Gough/Geary, Franklin/O'Farrell, Van Ness/Fell, Van Ness/Hayes, and Van Ness/Broadway). An examination of the Cathedral Hill Campus project contributions to the critical movements at these latter five intersections operating at LOS E or LOS F conditions indicated that the Cathedral Hill Campus project would have less-than-significant project contributions at these five intersections. Therefore, **the Cathedral Hill Campus project's contribution to the impacts identified for the combined cumulative impacts of the Cathedral Hill Campus project and the BRT projects would be less than significant**.

IMPACT TR-117

If the proposed Van Ness Avenue and Geary Corridor Bus Rapid Transit projects are implemented, the Cathedral Hill Campus project's contribution to the combined cumulative impacts of the Cathedral Hill Campus and BRT projects at the intersection of Polk/Geary would be significant. (Significant and Unavoidable)

As determined in Impact TR-19 (page 4.5-113), the Cathedral Hill Campus project's contribution to the impacts identified for the combined effect of the Cathedral Hill Campus project and the BRT projects at the intersection of Polk/Geary would be significant and unavoidable for 2015 Modified Baseline conditions. Therefore, **the**

contribution of the Cathedral Hill Campus project to the combined cumulative impacts at the intersection of Polk/Geary would also be significant and unavoidable.

IMPACT TR-118 *If the proposed Van Ness Avenue and Geary Corridor Bus Rapid Transit projects are implemented, the Cathedral Hill Campus project's contribution to the combined cumulative impacts of the Cathedral Hill Campus and BRT projects at the intersection of Van Ness/Market would be significant. (Significant and Unavoidable)*

As determined in Impact TR-20 (page 4.5-114), the Cathedral Hill Campus project's contribution to the impacts identified for the combined effect of the Cathedral Hill Campus project and the BRT projects at the intersection of Van Ness/Market would be significant and unavoidable for 2015 Modified Baseline conditions. Therefore, **the contribution of the Cathedral Hill Campus project to the combined cumulative impacts at the intersection of Van Ness/Market would also be significant and unavoidable**.

IMPACT TR-119 *For the Two-Way Post Street Variant, if the proposed Van Ness Avenue and Geary Corridor Bus Rapid Transit projects are implemented, the Cathedral Hill Campus project's contribution to the combined cumulative impacts of the Cathedral Hill Campus and BRT projects at five intersections would be less than significant. (Less than Significant)*

As described in Impact TR-21 (page 4.5-114), a sensitivity analysis was conducted to assess the potential combined effects of the Cathedral Hill Campus project Two-Way Post Street Variant and the proposed BRT projects. This analysis was conducted at selected intersections. When the results of the analysis indicated that an intersection would operate at LOS E or LOS F with both the Cathedral Hill Campus project Two-Way Post Street Variant and the BRT projects, the Cathedral Hill Campus project contribution to the critical movements was examined to determine whether the proposed Cathedral Hill Campus project contributions would be considered significant.

A total of 10 study intersections were analyzed for combined project and BRT impacts assessment (Gough/Geary, Franklin/O'Farrell, Franklin/Geary, Franklin/Pine, Van Ness/Fell, Van Ness/Hayes, Van Ness/Bush, Van Ness/Pine, Van Ness/Broadway, and Polk/Sutter) for future year 2030 cumulative conditions.

The sensitivity analysis for the combined effect of the Cathedral Hill Campus project Two-Way Post Street Variant and the BRT projects indicated that five of the 10 intersections would operate at LOS D or better (Franklin/Geary, Franklin/Pine, Van Ness/Bush, Van Ness/Pine, and Polk/Sutter) and five would operate at LOS E or LOS F conditions (Gough/Geary, Franklin/O'Farrell, Van Ness/Fell, Van Ness/Hayes, and Van Ness/Broadway). An examination of the Cathedral Hill Campus project contributions to the critical movements at these latter five intersections that would operate at LOS E or LOS F indicated that the Cathedral Hill Campus project would have less-than-significant project contributions at these five intersections. Therefore, as under the proposed LRDP, **the contribution to the impacts identified for the combined cumulative impacts of the Two-Way Post Street Variant and the BRT projects would be less than significant**.

IMPACT TR-120 *For the Two-Way Post Street Variant, if the proposed Van Ness Avenue and Geary Corridor Bus Rapid Transit projects are implemented, the Cathedral Hill Campus project's contribution to the combined cumulative impacts of the Cathedral Hill Campus and BRT projects at the intersection of Polk/Geary would be significant. (Significant and Unavoidable)*

As determined in Impact TR-22 (page 4.5-115), the Cathedral Hill Campus project's contribution to the impacts identified for the combined effect of the Cathedral Hill Campus project and the BRT projects at the intersection of Polk/Geary would be significant and unavoidable for 2015 Modified Baseline conditions. Therefore, similar to the contribution of the Cathedral Hill Campus LRDP project, **the contribution to the combined cumulative impacts of the Two-Way Post Street Variant and BRT projects at the intersection of Polk/Geary would also be significant and unavoidable**.

IMPACT TR-121 *For the Two-Way Post Street Variant, if the proposed Van Ness Avenue and Geary Corridor Bus Rapid Transit projects are implemented, the Cathedral Hill Campus project's contribution to the combined cumulative impacts of the Cathedral Hill Campus and BRT projects at the intersection of Van Ness/Market would be significant. (Significant and Unavoidable)*

As determined in Impact TR-23 (page 4.5-115), the Cathedral Hill Campus project's contribution to the impacts identified for the combined effect of the Cathedral Hill Campus project and the BRT projects at the intersection of Van Ness/Market would be significant and unavoidable for 2015 Modified Baseline conditions. Therefore, as under the proposed LRDP**, the contribution to the combined cumulative impacts of the Two-Way Post Street Variant and the BRT projects at the intersection of Van Ness/Market would also be significant and unavoidable**.

IMPACT TR-122 *For the MOB Access Variant, if the proposed Van Ness Avenue and Geary Corridor Bus Rapid Transit projects are implemented, the Cathedral Hill Campus project's contribution to the combined cumulative impacts of the Cathedral Hill Campus project MOB Access Variant and BRT projects at five intersections would be less than significant. (Less than Significant)*

As described in Impact TR-18 (page 4.5-111), a sensitivity analysis was conducted to assess the potential combined effects of the Cathedral Hill Campus project MOB Access Variant and the proposed BRT projects. This analysis was conducted at selected intersections. When the results of the analysis indicated that an intersection would operate at LOS E or LOS F with both the Cathedral Hill Campus project and the BRT projects, the Cathedral Hill Campus project contribution to the critical movements was examined to determine whether the proposed Cathedral Hill Campus project contributions would be considered significant under the MOB Access Variant conditions.

A total of 10 study intersections were analyzed for combined project and BRT impacts assessment (Gough/Geary, Franklin/O'Farrell, Franklin/Geary, Franklin/Pine, Van Ness/Fell, Van Ness/Hayes, Van Ness/Bush, Van Ness/Pine, Van Ness/Broadway, and Polk/Sutter) for future year 2030 cumulative conditions.

The sensitivity analysis for the combined effect of the Cathedral Hill Campus project MOB Access Variant and the BRT projects indicated that five of the 10 intersections would operate at LOS D or better (Franklin/Geary, Franklin/Pine, Van Ness/Bush, Van Ness/Pine, and Polk/Sutter) and five would operate at LOS E or LOS F conditions (Gough/Geary, Franklin/O'Farrell, Van Ness/Fell, Van Ness/Hayes, and Van Ness/Broadway). An examination of the Cathedral Hill Campus project contributions to the critical movements at these latter five intersections that would operate at LOS E or LOS F indicated that the Cathedral Hill Campus project would have less-than-significant project contributions at these five intersections. Therefore, as under the proposed LRDP**, the contribution to the impacts identified for the combined cumulative impacts of the MOB Access Variant and the BRT projects would be less than significant**.

IMPACT TR-123 *For the MOB Access Variant, if the proposed Van Ness Avenue and Geary Corridor Bus Rapid Transit projects are implemented, the Cathedral Hill Campus project's contribution to the combined cumulative impacts of the Cathedral Hill Campus project MOB Access Variant and BRT projects at the intersection of Polk/Geary would be significant. (Significant and Unavoidable)*

As determined in Impact TR-25 (page 4.5-116), the Cathedral Hill Campus project's contribution to the impacts identified for the combined effect of the Cathedral Hill Campus project and the BRT projects at the intersection of

Polk/Geary would be significant and unavoidable for 2015 Modified Baseline conditions. Therefore, as under the proposed LRDP**, the contribution to the combined cumulative impacts of the MOB Access Variant and the BRT projects at the intersection of Polk/Geary would also be significant and unavoidable**.

IMPACT TR-124 *For the MOB Access Variant, if the proposed Van Ness Avenue and Geary Corridor Bus Rapid Transit projects are implemented, the Cathedral Hill Campus project's contribution to the combined cumulative impacts of the Cathedral Hill Campus project MOB Access Variant and BRT projects at the intersection of Van Ness/Market would be significant. (Significant and Unavoidable)*

As determined in Impact TR-26 (page 4.5-116), the Cathedral Hill Campus project's contribution to the impacts identified for the combined effect of the Cathedral Hill Campus project and the BRT projects at the intersection of Van Ness/Market would be significant and unavoidable for 2015 Modified Baseline conditions. Therefore, as under the proposed LRDP**, the contribution to the combined cumulative impacts of the MOB Access Variant and the BRT projects at the intersection of Van Ness/Market would also be significant and unavoidable**.

◆ Pacific Campus

IMPACT TR-125 *Implementation of the Pacific Campus project would have less-than-significant impacts at the intersection of Market/Octavia/U.S. 101, which would operate at LOS F under 2030 Cumulative No Project conditions and 2030 Cumulative plus Project conditions. (Less than Significant)*

An intersection level of service analysis was conducted for traffic operations for the 2030 Cumulative plus Project conditions and findings are presented in Table 4.5-35 (page 4.5-169). The results show that of the 16 study intersections, only the intersection of Market/Octavia/U.S. 101 is projected to operate at unacceptable levels under the 2030 Cumulative No Project conditions, and 2030 Cumulative plus Project conditions. The poor operating conditions at this study intersection would be because of the high existing volumes destined to and from the U.S. 101 ramp, and traffic volume increases associated with other developments in the project vicinity. Because the Pacific Campus project would not contribute significantly to the poor operating conditions under 2030 Cumulative No Project conditions, **impacts at the intersection of Market/Octavia/U.S. 101 would be less than significant**.

◆ California Campus

IMPACT TR-126 *Implementation of the CPMC LRDP would have less-than-significant impacts at two California Campus study intersections which would operate at LOS E or LOS F under 2030 Cumulative No Project conditions. (Less than Significant)*

Table 4.5-37 (page 4.5-180) presents the weekday p.m. peak-hour intersection level of service for 2030 Cumulative No Project conditions for the 14 study intersections in the vicinity of the California Campus. The results of the traffic analysis indicate that of the 14 study intersections, only the intersections of Arguello/California and Market/Octavia/U.S. 101 would operate at unacceptable levels of service of LOS E or LOS F.

Because implementation of the CPMC LRDP would result in a decrease in vehicle trips to and from the California Campus, the California Campus would not contribute to future cumulative conditions at the study intersections, including the two intersections that would operate at LOS E or LOS F under 2030 Cumulative conditions. The poor operating conditions at these two study intersections would be because of traffic volume increases associated with other developments in the project vicinity. Because the development would not contribute significantly to the poor operating conditions at the intersections of Arguello/California and Market/Octavia/U.S. 101 under the 2030 Cumulative Plus Project scenario, **this traffic impact would be less than significant**.

◆ Davies Campus

IMPACT TR-127 *Implementation of the Davies Campus project would have significant impacts at the intersection of Church/Market/14th Street, which would operate at LOS F under 2030 Cumulative No Project conditions and 2030 Cumulative plus Project conditions. (Significant and Unavoidable)*

At the signalized intersection of Church/Market/14th which would operate at LOS F under 2030 Cumulative No Project conditions, and would continue to operate at LOS F under 2030 Cumulative plus Project conditions, the increase in vehicle trips generated by the project were reviewed to determine whether the increase would contribute considerably to critical movements operating at LOS E or LOS F. Based on this examination, the Project contributions were determined to be significant. In addition, the project would result in a significant impact under 2015 Modified Baseline plus Project conditions.

The roadway capacity at this intersection has been maximized and potential improvements are limited by the right-of-way constraints and competing traffic volume demands on the north/south and east/west approaches.

Providing additional travel lanes at this intersection would require substantial reduction in sidewalk widths, which would be inconsistent with the pedestrian environment encouraged by the City of San Francisco. No feasible mitigation measures have been identified, and **this impact at the intersection of Church/Market/14th would remain significant and unavoidable**.

IMPACT TR-128 *Implementation of the Davies Campus project would have less-than-significant impacts at six study intersections that would operate at LOS E or LOS F under 2030 Cumulative No Project conditions and 2030 Cumulative plus Project conditions. (Less than Significant)*

Table 4.5-38 (page 4.5-185) presents the comparison of intersection LOS for 2030 Cumulative No Project, and plus Project conditions. The results indicate that of the 13 study intersections, seven intersections would operate at LOS F conditions. Of those intersections, the Davies Campus Project would not contribute significantly to critical movements at the following six intersections:

- Divisadero/Haight
- Castro/Duboce
- Castro/14th
- Castro/Market/17th
- Sanchez/Market/15th
- Octavia Boulevard/Market/U.S.101

At six intersections that would operate at LOS E or LOS F under 2030 Cumulative No Project conditions, and would continue to operate at LOS E or LOS F under 2030 Cumulative plus Project conditions, the increase in vehicle trips from 2030 Cumulative No Project caused by the project was determined to be less than significant.

The poor operating conditions at these study intersections would be because of traffic volume increases associated with other developments in the project vicinity. Because the project would not contribute significantly to the poor operating conditions at these six intersections under the 2030 Cumulative plus Project conditions, **project-related impacts of the Davies Campus at these six intersections would be less than significant**.

IMPACT TR-129 *Implementation of the Davies Campus project would have less-than-significant impacts at six study intersections that would operate at LOS D or better under 2030 Cumulative plus Project conditions. (Less than Significant)*

With implementation of the Davies Campus project, the following seven study intersections would continue to operate at LOS D or better during the a.m. and p.m. peak hours under 2030 Cumulative plus Project conditions, and, **therefore, project-related traffic impacts at these locations would be less than significant:**

- Scott/Duboce
- Noe/Duboce
- Noe/14th
- Sanchez/Duboce

- Fillmore/Duboce
- Church/Duboce

◆ St. Luke's Campus

IMPACT TR-130 *Implementation of the St. Luke's Campus project would have less-than-significant cumulative impacts at six study intersections which would operate at LOS E or LOS F under 2030 Cumulative No Project conditions and 2030 Cumulative plus Project conditions. (Less than Significant)*

As indicated in Table 4.5-39 (page 4.5-202), under 2030 Cumulative No Project conditions, six of the 15 study intersections would operate at LOS F conditions during the p.m. peak hour; the remaining nine study intersections would operate at LOS D or better. The six study intersections that would operate at LOS F under 2030 Cumulative No Project Conditions include:

- Cesar Chavez/Valencia
- Cesar Chavez/Guerrero
- Guerrero/27th
- Guerrero/28th
- Cesar Chavez/South Van Ness
- Cesar Chavez/Dolores

At these six intersections the increase in vehicle trips generated by the project was reviewed to determine whether the project's increase would contribute considerably to critical movements operating at LOS E or LOS F at these intersections. Based on this examination, **the St. Luke's Campus project's contributions at these intersections were determined to be less than significant**.

IMPACT TR-131 *Implementation of the St. Luke's Campus project would have less-than-significant impacts at nine study intersections that would operate at LOS D or better under 2030 Cumulative plus Project conditions. (Less than Significant)*

With implementation of the St. Luke's Campus project, the following nine study intersections would continue to operate at LOS D or better during the a.m. and p.m. peak hours under 2030 Cumulative plus Project conditions and, **therefore, traffic impacts at these locations would be less than significant**:

- Cesar Chavez/Bartlett
- Guerrero/Duncan
- Mission/Valencia/Fair
- Cesar Chavez/Mission
- Guerrero/26th
- San Jose/29th
- Valencia/26th
- Valencia/Duncan/Tiffany
- Mission/29th

Overview of Cumulative Transit Impacts at the proposed Cathedral Hill Campus

The proposed Cathedral Hill Campus project would generate new transit riders. Under the 2030 Cumulative plus Project Conditions, Muni would have sufficient capacity to accommodate all the project-generated riders while maintaining its capacity utilization standard of 85 percent or less. The Two-Way Post Street Variant and the MOB Access Variant would not change the number of transit trips generated by the proposed project and, therefore, would result in similar less-than-significant cumulative capacity utilization impacts.

The proposed Cathedral Hill Campus project would add vehicles to the street network and riders to the Muni lines. Under the 2030 Cumulative plus Project conditions, the increased congestion and ridership would cause operational delays to Muni lines 49-Van Ness-Mission (a.m. and p.m. peak hours), 47-Van Ness (p.m. peak hour), 38/38L-Geary (a.m. and p.m. peak hours), 19-Polk (p.m. peak hour), and 3-Jackson (p.m. peak hour), requiring additional vehicles to maintain proposed levels of service. To mitigate the impact on transit, CPMC would financially compensate SFMTA for the cost of providing the additional services. Although the mitigation measure would reduce the impacts to a less-than-significant level, the ability of SFMTA to provide additional service for the project is uncertain. Therefore, the cumulative impact on transit would remain significant and unavoidable. The Two-Way Post Street and the MOB Access variants would result in the same cumulative transit delay impacts as the proposed project. The same mitigation measures identified for the proposed project would apply to both variants.

The CPMC LRDP project was determined to have a significant cumulative impact on transit operations if it would result in an increase in transit vehicle travel times such that additional vehicles would be required to maintain headways. The need for additional transit vehicles was determined by comparing the project’s travel time increase on a particular route to the headway anticipated under the TEP, which is reasonably expected to be implemented by 2030. An impact was identified if the travel time increases were greater than half of the proposed TEP headway or if the number of required vehicles estimated using SFMTA’s cost/scheduling model increased by one or more vehicles with the addition of project travel demand. A cumulative impact was also identified if Cathedral Hill Campus resulted in a project-specific transit impact.

IMPACT TR-132 *Implementation of the Cathedral Hill Campus project would not cause transit demand to exceed the proposed transit system capacity at the study area corridors under 2030 Cumulative plus Project conditions. (Less than Significant)*

Table 4.5-21 (page 4.5-119) summarizes the corridor capacity utilization analysis for the routes serving the Cathedral Hill Campus vicinity. The additional transit demand could be accommodated during the p.m. peak hour, and all four corridors would continue to operate at less than Muni’s 85 percent capacity utilization standards.

Therefore, **the Cathedral Hill Campus project impact on 2030 Cumulative transit ridership and capacity at the corridors would be less than significant**.

IMPACT TR-133 *Implementation of the Cathedral Hill Campus project would increase congestion along Van Ness Avenue under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 49-Van Ness-Mission bus route. (Significant and Unavoidable with Mitigation)*

The Cathedral Hill Campus project was determined to have a significant impact on transit operations if it would result in an increase in transit vehicle travel times such that additional vehicles would be required to maintain the proposed headways. The need for additional transit vehicles was determined by comparing the project's travel time increases on a particular route to the proposed headway. An impact was identified if the travel time increases were greater than half of the proposed headway, or if the number of required vehicles estimated using SFMTA's cost/scheduling model increases by one or more vehicles with the additional of project travel demand. Table 4.5-22 (page 4.5-121) presents a comparison of the travel time increases to the proposed headways for the transit routes in the immediate vicinity of the Cathedral Hill Campus. The results of the analysis using SFMTA's cost/scheduling model, in terms of additional buses needed to maintain headways, are summarized in Table 4.5-23 (page 4.5-122).

Under 2030 Cumulative plus Project condition, the proposed Cathedral Hill Campus project would result in increases in travel time on the northbound 49-Van Ness-Mission by about 5 minutes during the a.m. peak hour. This increase would be more than half of the proposed headway of 7½ minutes. In addition, as indicated in Table 4.5-23 (page 4.5-122), the results of SFMTA's cost/scheduling model indicated that an additional bus would be needed during the a.m. and p.m. peak hours. Therefore, **project-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 49-Van Ness-Mission bus route during the a.m. and p.m. peak hours would be a significant impact**. Implementation of Mitigation Measure MM-TR-29 would serve to reduce delays along the Van Ness Avenue corridor and reduce transit delay impacts to a less-than-significant level. However, because the ability of SFMTA to provide additional service on this line is uncertain, the feasibility of implementing the mitigation measure is unknown; therefore, **the Cathedral Hill Campus project impacts on the 49-Van Ness-Mission bus route would remain significant and unavoidable**.

IMPACT TR-134 *Implementation of the Cathedral Hill Campus project would increase congestion along Van Ness Avenue under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 47-Van Ness bus route. (Significant and Unavoidable with Mitigation)*

Table 4.5-23 (page 4.5-122) summarizes the results of the assessment conducted by SFMTA of the Cathedral Hill Campus project impacts using the SFMTA's cost/scheduling model, and indicates that under 2030 Cumulative plus Project conditions, an additional bus would be required on the 47-Van Ness to maintain peak period headways during the p.m. peak hour. Therefore, **project-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 47-Van Ness bus route during the p.m. peak hour would be a significant impact**.

Mitigation Measure MM-TR-134

CPMC shall ensure that the transit delay impact related to the Cathedral Hill Campus project on the 47-Van Ness is reduced to a less-than-significant level by financially compensating the SFMTA for the cost of providing the additional service needed to accommodate the project at existing levels of service. The financial contribution shall be calculated and applied in a manner that is consistent with the SFMTA cost/scheduling model. The amount and schedule for payment and commitment to application of service needs shall be set forth in a Transit Mitigation Agreement between CPMC and SFMTA.

Implementation of Mitigation Measure MM-TR-134 would reduce transit delay impacts to a less-than-significant level. However, because the ability of SFMTA to provide additional service on this line is uncertain, the feasibility of implementing the mitigation measure is unknown and, therefore, **the Cathedral Hill Campus project impacts on the 47-Van Ness bus route would remain significant and unavoidable**.

IMPACT TR-135 *Implementation of the Cathedral Hill Campus project would increase congestion along Geary Street under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 38/38L-Geary bus routes. (Significant and Unavoidable with Mitigation)*

Assessment conducted by SFMTA of the Cathedral Hill Campus project impacts on the 38/38L-Geary using the SFMTA's cost/scheduling model indicated that under 2030 Cumulative plus Project conditions, an additional bus would be required to maintain peak period headways during the a.m. peak hour, and two additional buses would be required during the p.m. peak hour. Therefore, **project-related transit delays resulting from on study area roadways and passenger loading delays associated with increased ridership on operation of the 38/38L-Geary during the a.m. and p.m. peak hours would be a significant impact.**

Implementation of Mitigation Measure MM-TR-30 would reduce transit delay impacts to a less-than-significant level. However, because the ability of SFMTA to provide additional service on this line is uncertain, the feasibility of implementing the mitigation measure is unknown and, therefore, **the project impacts on the 38/38L-Geary would remain significant and unavoidable**.

IMPACT TR-136 *Implementation of the Cathedral Hill Campus project would increase congestion along Polk Street under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 19-Polk bus route. (Significant and Unavoidable with Mitigation)*

As indicated in Table 4.5-22 (page 4.5-121), under 2030 Cumulative plus Project condition, the proposed Cathedral Hill Campus project would result in increases in travel time on the southbound 19-Polk bus route by about 8 minutes during the p.m. peak hour. This increase would be more than half of the proposed headway of 10 minutes. In addition, as indicated in Table 4.5-23 (page 4.5-122), an additional bus would be required during the p.m. peak hour. Therefore, **project-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 19-Polk bus route during the p.m. peak hour would be a significant impact**.

Implementation of Mitigation Measure MM-TR-31 would reduce transit delay impacts to a less-than-significant level. However, because the ability of SFMTA to provide additional service on this line is uncertain, the feasibility of implementing the mitigation measure is unknown and, therefore, **the Cathedral Hill Campus project impacts on the 19-Polk bus route would remain significant and unavoidable**.

IMPACT TR-137 *Implementation of the Cathedral Hill Campus project would increase congestion along Post Street under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 3-Jackson bus route. (Significant and Unavoidable with Mitigation)*

Table 4.5-23 (page 4.5-122) summarizes the results of the assessment conducted by SFMTA of the Cathedral Hill Campus project impacts using the SFMTA's cost/scheduling model, and indicates that under 2030 Cumulative plus Project conditions, an additional bus would be required on the 3-Jackson bus route to maintain peak period headways during the p.m. peak hour. Therefore, **project-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 3-Jackson bus route during the p.m. peak hour would be a significant impact**.

Mitigation Measure MM-TR-137

> CPMC shall ensure that the transit delay impact related to the Cathedral Hill Campus project on the 3-Jackson is reduced to a less-than-significant level by financially compensating the SFMTA for the cost of providing the service needed to accommodate the project at proposed levels of service. The financial contribution shall be calculated and applied in a manner that is consistent with the SFMTA cost/scheduling model. The amount and schedule for payment and commitment to application of service needs shall be set forth in a Transit Mitigation Agreement between CPMC and SFMTA.

The payment of the fee identified in Mitigation Measure MM-TR-137 would reduce the project's impact on the operation of the 3-Jackson bus route to a less-than-significant level. However, because the ability of SFMTA to provide additional service on this line is uncertain, the feasibility of the mitigation measure is unknown. Therefore, **the proposed project's impacts on the operation of the 3-Jackson bus route would remain significant and unavoidable.**

IMPACT TR-138 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would increase congestion along Van Ness Avenue under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 49-Van Ness-Mission bus route. (Significant and Unavoidable with Mitigation)*

Table 4.5-24 (page 4.5-125) presents the comparison of the travel time increases to the proposed headways for the transit routes in the immediate vicinity of the Cathedral Hill Campus for the Two-Way Post Street Variant. Under 2030 Cumulative plus Project conditions, the proposed Cathedral Hill Campus project Two-Way Post Street Variant would result in increases in travel time on the northbound 49-Van Ness-Mission bus route by about 4 minutes during the a.m. and p.m. peak hour. This increase would be more than half of the proposed headway of 7½ minutes. In addition, as indicated in Table 4.5-23 (page 4.5-122), the SFMTA cost/scheduling model indicated that an additional bus would be needed during the a.m. and p.m. peak hours. Therefore, the **Two-Way Post Street Variant-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 49-Van Ness-Mission bus route during the a.m. and p.m. peak hours would be a significant impact**.

Implementation of Mitigation Measure MM-TR-29 would reduce transit delay impacts to a less-than-significant level. However, because ability of SFMTA to provide additional service on this line is uncertain, the feasibility of implementing the mitigation measure is unknown; therefore, as under the proposed LRDP, **the Two-Way Post Street Variant-related impacts on the 49-Van Ness-Mission bus route would remain significant and unavoidable**.

IMPACT TR-139 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would increase congestion along Van Ness Avenue under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 47-Van Ness bus route. (Significant and Unavoidable with Mitigation)*

Table 4.5-23 (page 4.5-122) summarizes the results of the assessment conducted by SFMTA of the Cathedral Hill Campus project impacts using the SFMTA's cost/scheduling model, and indicates that under 2030 Cumulative plus Project conditions, an additional bus would be required on the 47-Van Ness bus route to maintain peak period headways during the p.m. peak hour. Therefore, **Two-Way Post Street Variant-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 47-Van Ness bus route during the p.m. peak hour would be a significant impact**.

Implementation of Mitigation Measure MM-TR-134 would reduce transit delay impacts to a less-than-significant level. However, because the ability of SFMTA to provide additional service on this line is uncertain, the feasibility of implementing the mitigation measure is unknown and, therefore, **the Two-Way Post Street Variant-related impacts on the 47-Van Ness bus route would remain significant and unavoidable**.

IMPACT TR-140 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would increase congestion along Geary Street under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 38/38L-Geary bus routes. (Significant and Unavoidable with Mitigation)*

Assessment conducted by SFMTA of the Cathedral Hill Campus project Two-Way Post Street Variant impacts on the 38/38L-Geary using the SFMTA's cost/scheduling model indicated that under 2030 Cumulative plus Project conditions, an additional bus would be required to maintain headways during the a.m. peak hour, and two buses during the p.m. peak hour. Therefore, **Two-Way Post Street Variant-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 38/38L-Geary during the a.m. and p.m. peak hours would be a significant impact**.

Implementation of Mitigation Measure MM-TR-30 would reduce transit delay impacts to a less-than-significant level. However, because the ability of SFMTA to provide additional service on this line is uncertain, the feasibility of implementing the mitigation measure is unknown and, therefore, as with the proposed LRDP, **the Two-Way Post Street Variant-related impacts on the 38/38L-Geary would remain significant and unavoidable**.

IMPACT TR-141 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would increase congestion along Polk Street under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 19-Polk bus route. (Significant and Unavoidable with Mitigation)*

As indicated in Table 4.5-24 (page 4.5-125), under 2030 Cumulative plus Project condition, the proposed Cathedral Hill Campus project Two-Way Post Street Variant would result in increases in travel time on the southbound 19-Polk bus route by about 8 minutes during the p.m. peak hour. This increase would be more than half of the proposed headway of 10 minutes. In addition, as shown in Table 4.5-23, an additional bus would be required during the p.m. peak hour. Therefore, **Two-Way Post Street Variant-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 19-Polk bus route during the p.m. peak hour would be a significant impact.**

Implementation of Mitigation Measure MM-TR-31 would reduce transit delay impacts to a less-than-significant level. However, because the ability of SFMTA to provide additional service on this line is uncertain, the feasibility of implementing the mitigation measure is unknown and, therefore, as under the proposed LRDP, **the Two-Way Post Street Variant-related impacts on the 19-Polk bus route would remain significant and unavoidable**.

IMPACT TR-142 *Implementation of the Cathedral Hill Campus project Two-Way Post Street Variant would increase congestion along Post Street under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 3-Jackson bus route. (Significant and Unavoidable with Mitigation)*

Table 4.5-23 (page 4.5-122) summarizes the results of the assessment conducted by SFMTA of the Cathedral Hill Campus project impacts using the SFMTA's cost/scheduling model, and indicates that under 2030 Cumulative plus Project conditions, an additional bus would be required on the 3-Jackson bus route to maintain peak period headways during the p.m. peak hour. Therefore, **Two-Way Post Street Variant-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 3-Jackson bus route during the p.m. peak hour would be a significant impact**.

Implementation of Mitigation Measure MM-TR-137 would reduce transit delay impacts to a less-than-significant level. However, because the ability of SFMTA to provide additional service on this line is uncertain, the feasibility of implementing the mitigation measure is unknown and, therefore, as under the proposed LRDP, **the**

Two-Way Post Street Variant-related impacts on the 3-Jackson bus route would remain significant and unavoidable.

IMPACT TR-143 *Implementation of the Cathedral Hill Campus project MOB Access Variant would increase congestion along Van Ness Avenue under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 49-Van Ness-Mission bus route. (Significant and Unavoidable with Mitigation)*

Table 4.5-24 (page 4.5-125) presents the comparison of the travel time increases to the proposed headways for the transit routes in the immediate vicinity of the Cathedral Hill Campus for the MOB Access Variant. Under 2030 Cumulative plus Project conditions, the proposed Cathedral Hill Campus project MOB Access Variant would result in increases in travel time on the northbound 49-Van Ness-Mission bus route by about 4 minutes during the a.m. peak hour. This increase would be more than half of the proposed headway of 7½ minutes. In addition, as indicated in Table 4.5-23 (page 4.5-122), the SFMTA cost/scheduling model indicated that an additional bus would be needed during the a.m. and p.m. peak hours. Therefore, the **MOB Access Variant-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 49-Van Ness-Mission bus route during the a.m. and p.m. peak hours would be a significant impact**.

Implementation of Mitigation Measure MM-TR-29 would reduce transit delay impacts to a less-than-significant level. However, because the ability of SFMTA to provide additional service on this line is uncertain, the feasibility of implementing the mitigation measure is unknown; therefore, as under the proposed LRDP, **the MOB Access Variant-related impacts on the 49-Van Ness-Mission bus route would remain significant and unavoidable**.

IMPACT TR-144 *Implementation of the Cathedral Hill Campus project MOB Access Variant would increase congestion along Van Ness Avenue under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 47-Van Ness bus route. (Significant and Unavoidable with Mitigation)*

Table 4.5-23 (page 4.5-122) summarizes the results of the assessment conducted by SFMTA of the Cathedral Hill Campus project impacts using the SFMTA's cost/scheduling model, and indicates that under 2030 Cumulative plus Project conditions, an additional bus would be required on the 47-Van Ness bus route to maintain peak period headways during the p.m. peak hour. Therefore, **MOB Access Variant-related transit delays resulting**

from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 47-Van Ness bus route during the p.m. peak hour would be a significant impact.

Implementation of Mitigation Measure MM-TR-134 would reduce transit delay impacts to a less-than-significant level. However, because the ability of SFMTA to provide additional service on this line is uncertain, the feasibility of implementing the mitigation measure is unknown and, therefore, as under the proposed LRDP, **the MOB Access Variant-related impacts on the 47-Van Ness bus route would remain significant and unavoidable**.

IMPACT TR-145 *Implementation of the Cathedral Hill Campus project MOB Access Variant would increase congestion along Geary Street under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 38/38L-Geary bus routes. (Significant and Unavoidable with Mitigation)*

Assessment conducted by SFMTA of the Cathedral Hill Campus project MOB Access Variant impacts on the 38/38L-Geary using the SFMTA's cost/scheduling model indicated that under 2030 Cumulative plus Project conditions, an additional bus would be required to maintain peak period headways during the a.m. peak hour, and two additional buses during the p.m. peak hour. Therefore, **MOB Access Variant-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 38/38L-Geary during the a.m. and p.m. peak hours would be a significant impact**.

Implementation of Mitigation Measure MM-TR-30 would reduce transit delay impacts to a less-than-significant level. However, because the ability of SFMTA to provide additional service on this line is uncertain, the feasibility of implementing the mitigation measure is unknown and, therefore, as under the proposed LRDP, **the MOB Access Variant-related impacts on the 38/38L-Geary would remain significant and unavoidable**.

IMPACT TR-146 *Implementation of the Cathedral Hill Campus project MOB Access Variant would increase congestion and ridership along Polk Street under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 19-Polk bus route. (Significant and Unavoidable with Mitigation)*

Assessment conducted by SFMTA of the Cathedral Hill Campus project MOB Access Variant impacts on the 19-Polk using the SFMTA's cost/scheduling model indicated that under 2030 Cumulative plus Project conditions, an additional bus would be required to maintain peak period headways. Therefore, **MOB Access Variant-related transit delays resulting from congestion on study area roadways and passenger loading delays associated**

with increased ridership on operation of the 19-Polk during the p.m. peak hour would be a significant impact.

Implementation of Mitigation Measure MM-TR-31 would reduce transit delay impacts to a less-than-significant level. However, because the ability of SFMTA to provide additional service on this line is uncertain, the feasibility of the mitigation measure is unknown. Therefore, as under the proposed LRDP, **the MOB Access Variant-related impacts on the 19-Polk would remain significant and unavoidable**.

IMPACT TR-147 *Implementation of the Cathedral Hill Campus project MOB Access Variant would increase congestion along Post Street under 2030 Cumulative plus Project conditions, which would increase travel times and impact operations of the 3-Jackson bus route. (Significant and Unavoidable with Mitigation)*

Table 4.5-23 (page 4.5-122) summarizes the results of the assessment conducted by SFMTA of the Cathedral Hill Campus project impacts using the SFMTA's cost/scheduling model, and indicates that under 2030 Cumulative plus Project conditions, an additional bus would be required on the 3-Jackson bus route to maintain peak period headways during the p.m. peak hour. Therefore, as under the proposed LRDP, the **MOB Access Variant-related transit delays resulting from congestion on study area roadways and passenger loading delays associated with increased ridership on operation of the 3-Jackson bus route during the p.m. peak hour would be a significant impact**.

Implementation of Mitigation Measure MM-TR-137 would reduce transit delay impacts to a less-than-significant level. However, because the ability of SFMTA to provide additional service on this line is uncertain, the feasibility of implementing the mitigation measure is unknown and, therefore, **the MOB Access Variant-related impacts on the 3-Jackson bus route would remain significant and unavoidable**.

IMPACT TR-148 *Implementation of the Pacific Campus project would not cause transit demand to exceed the transit system capacity at the study area corridors under 2030 Cumulative plus Project conditions. (Less than Significant)*

Table 4.5-36 (page 4.5-172) summarizes the corridor capacity utilization analysis for the routes serving the Pacific Campus vicinity. The additional transit demand could be accommodated during the p.m. peak hour, and all four corridors would continue to operate at less than Muni's 85 percent capacity utilization standards. Therefore, **Pacific Campus project impacts on 2030 Cumulative transit ridership and capacity at the corridors would be less than significant**.

IMPACT TR-149 *Implementation of the CPMC LRDP would not cause transit demand at the California Campus to exceed the transit system capacity at the study area corridors under 2030 Cumulative plus Project conditions. (Less than Significant)*

Since implementation of the CPMC LRDP would result in a decrease in transit trips to and from the California Campus, the California Campus project would not contribute to future cumulative conditions at the transit corridors. As indicated in Table 4.5-36 (page 4.5-172), under 2030 Cumulative No Project conditions, the corridor capacity utilization for the routes serving the California Campus vicinity would operate at less than Muni's 85 percent capacity utilization standards. Therefore, **the California Campus project impacts on 2030 Cumulative transit ridership and capacity at the corridors on the California Campus would be less than significant**.

IMPACT TR-150 *Implementation of the Davies Campus project would not cause transit demand to exceed the transit system capacity at the study area corridors under 2030 Cumulative plus Project conditions. (Less than Significant)*

Table 4.5-36 (page 4.5-172) summarizes the corridor capacity utilization analysis for the routes serving the Davies Campus vicinity. The additional transit demand could be accommodated during the p.m. peak hour, and all four corridors would continue to operate at less than Muni's 85 percent capacity utilization standards. Therefore, **Davies Campus project impacts on 2030 Cumulative transit ridership and capacity at the corridors would be less than significant**.

IMPACT TR-151 *Implementation of the St. Luke's Campus project would not cause transit demand to exceed the transit system capacity at the study area corridors under 2030 Cumulative plus Project conditions. (Less than Significant)*

Table 4.5-21 (page 4.5-119) summarizes the corridor capacity utilization analysis for the routes serving the St. Luke's Campus vicinity. The additional transit demand could be accommodated during the p.m. peak hour, and all four corridors would continue to operate at less than Muni's 85 percent capacity utilization standards. Therefore, **St. Luke's Campus project impacts on 2030 Cumulative transit ridership and capacity at the corridors would be less than significant**.

IMPACT TR-152 *Implementation of CPMC LRDP construction of the Cathedral Hill Campus (including all Cathedral Hill Variants) would contribute to cumulative construction impacts in the project vicinity. (Significant and Unavoidable with Mitigation)*

Within the 2011 to 2019 time frame for buildout of the CPMC LRDP, the construction activities associated with individual campus projects could potentially overlap with construction activities at other development projects in the vicinity. Construction activities associated with development are ongoing activities, and traffic associated with some level of development is reflected in existing traffic operations. However, the construction of the Cathedral Hill Campus would also overlap with the proposed Van Ness Avenue BRT and Geary Corridor BRT projects. While both of these projects are still undergoing environmental review, the Van Ness Avenue BRT is projected to be in service by 2014, and the Geary Corridor BRT is projected to be in service by 2015–2016. The overlapping construction activities would increase the number of construction worker vehicles and trucks traveling to and from the vicinity of the Cathedral Hill Campus. In addition, implementation of the BRT improvements on Van Ness Avenue would require travel lane closures that would temporarily and permanently affect roadway capacity. These impacts would be evaluated as part of the ongoing environmental review for the BRT projects.

Impact TR-55 identified significant and unavoidable impacts on the transportation network related to the construction activities at the Cathedral Hill Campus. Implementation of Mitigation Measure MM-TR-55 would minimize impacts associated with the Cathedral Hill Campus project and reduce the project's contributions to cumulative impact in overlapping areas. However, given the magnitude of these impacts, and the proximity of the Cathedral Hill Campus to the Van Ness Avenue BRT and Geary Corridor BRT projects, some disruption and increased delays would still occur even with implementation of this measure, and it is possible that significant construction-related transportation impacts on local roadways in the vicinity of the Cathedral Hill Campus would still occur. Therefore, **the Cathedral Hill Campus cumulative construction impacts would be significant and unavoidable.**

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4.6 NOISE

This section describes ambient noise and vibration conditions in the vicinity of the existing and proposed CPMC campuses and summarizes applicable federal, state, and local regulations, including the Environmental Protection Element of the *San Francisco General Plan* (General Plan) and San Francisco Noise Control Ordinance. For both near-term and long-term projects under the CPMC LRDP, this section assesses the potential to expose sensitive receptors to noise or generate noise levels exceeding applicable standards, and to create a substantial increase in ambient noise levels. Also assessed are the compatibility of existing and proposed land uses with ambient noise levels and the exposure of persons to groundborne vibration. This section also identifies mitigation measures to reduce or eliminate associated noise impacts and analyzes cumulative impacts.

The impact assessment methodology for this section is consistent with approaches recommended by the Federal Transit Administration (FTA), the California Department of Transportation (Caltrans), and the Major Environmental Analysis Division (MEA) of the San Francisco Planning Department. Existing noise levels were obtained via on-site reconnaissance; noise modeling was conducted using acceptable methodologies (e.g., the FTA *Transit Noise and Vibration Impact Assessment Manual*); stationary-source noise levels were obtained from manufacturer specifications and based on technical reports (e.g., Shen Milsom & Wilke [SM&W] memorandum; April 2, 2009; *CPMC—Cathedral Hill Hospital Aduromed Airborne Noise Analysis,* SM&W Project #07560); and traffic data from the traffic impact analysis prepared for this project by Fehr and Peers Associates were used to model existing and future traffic noise levels.

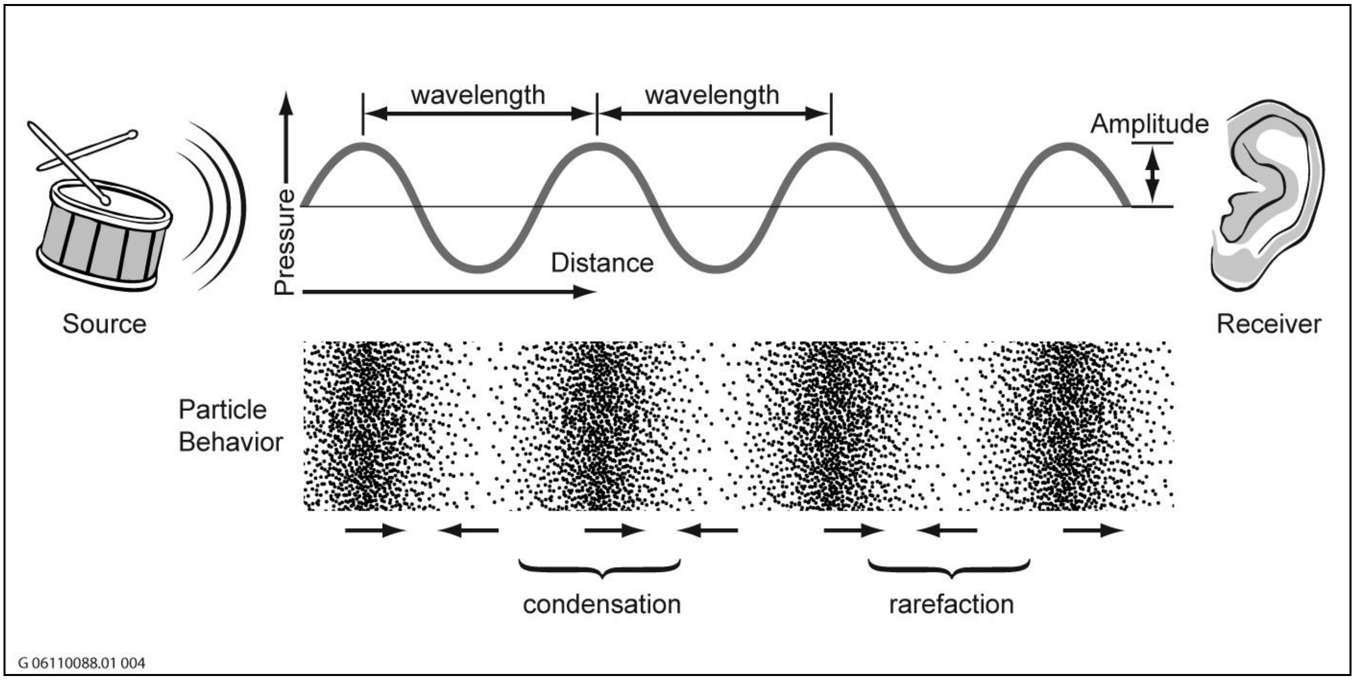
4.6.1 ENVIRONMENTAL SETTING

SOUND FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, unexpected, or unwanted. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave by a disturbance or vibration that causes pressure variation in air that the human ear can detect.

Sound Properties

A sound wave is introduced into a medium (air) by a vibrating object. The vibrating object (e.g., vocal cords, the string of a guitar, or the diaphragm of a radio speaker) is the source of the disturbance that moves through the medium (see Figure 4.6-1, “Sound Wave Properties,” on page 4.6-2). Regardless of the type of source creating the sound wave, the particles of the medium through which the sound moves are vibrating in a back-and-forth motion at a given rate (frequency). The frequency of a wave refers to how often the particles vibrate when a wave passes through the medium. The number of complete back-and-forth vibrations by a particle per unit of time indicates the frequency. One complete back-and-forth vibration is called a cycle. If a particle of air undergoes 1,000 cycles



Source: Graphic developed by AECOM in 2009

Sound Wave Properties **Figure 4.6-1**

in 2 seconds, then the frequency of the wave would be 500 cycles per second. The common unit used for frequency, cycles per second, is called Hertz (Hz).

Each particle vibrates as a result of the motion of its nearest neighbor. For example, the first particle of the medium begins vibrating at 500 Hz and sets the second particle of the medium into motion at the same frequency (500 Hz). The second particle begins vibrating at 500 Hz and thus sets the third particle into motion at 500 Hz. The process continues throughout the medium; hence each particle vibrates at the same frequency, which is the frequency of the original source. Thus, a guitar string vibrating at 500 Hz will set the air particles in the room vibrating at the same frequency (500 Hz), which carries a sound signal to the ear of a listener that is detected as a 500-Hz sound wave.

The back-and-forth vibration of the particles of the medium is not the only observable phenomenon occurring at a given frequency. Because a sound wave is a pressure wave, a detector could be used to detect oscillations in pressure from high to low and back to high pressure. As the compression (high-pressure) and rarefaction (low-pressure) disturbances move through the medium, they would reach the detector at a given frequency. For example, a compression would reach the detector 500 times per second if the frequency of the wave were 500 Hz. Similarly, a rarefaction would reach the detector 500 times per second if the frequency of the wave were 500 Hz. Thus, the frequency of a sound wave refers not only to the number of back-and-forth vibrations by the particles per unit of time, but also to the number of compression or rarefaction disturbances that pass a given point per unit of time.

A detector could be used to detect the frequency of these pressure oscillations over a given period of time. The period of the sound wave can be found by measuring the time between successive high-pressure points (corresponding to the compressions) or the time between successive low-pressure points (corresponding to the rarefactions). The frequency is simply the reciprocal of the period. Thus, an inverse relationship exists: As frequency increases, the period decreases, and vice versa.

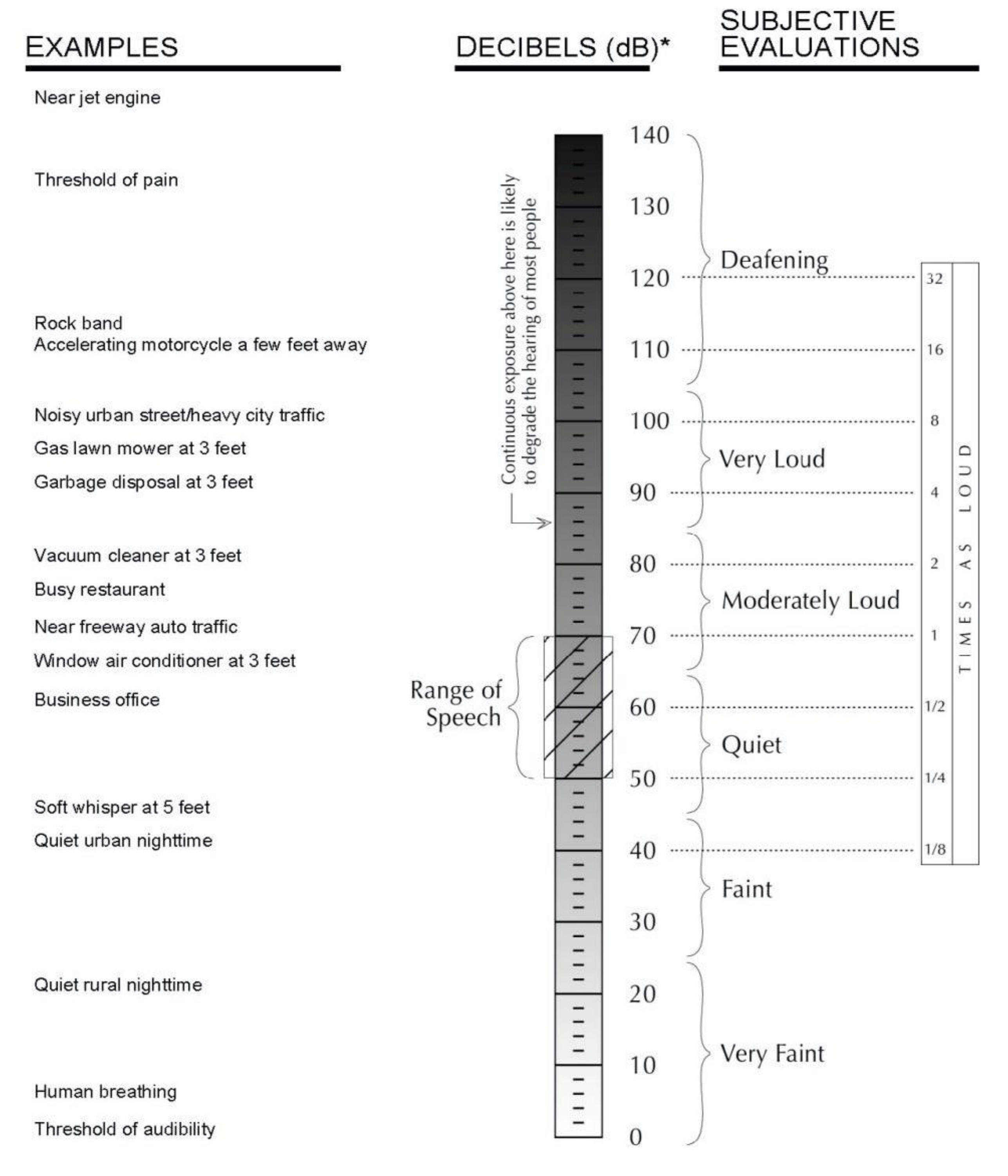
A wave is a phenomenon that transports energy along a medium. The amount of energy carried by a wave is related to the amplitude (loudness) of the wave. A high-energy wave is characterized by large amplitude; a low-energy wave is characterized by small amplitude. The amplitude of a wave refers to the maximum amount that a particle is displaced from its rest position. The energy transported by a wave is directly proportional to the square of the amplitude of the wave. This means that a doubling of the wave's amplitude indicates a quadrupling of the energy transported by the wave.

Sound and the Human Ear

Because the human ear can detect a wide range of sound-pressure fluctuations, sound-pressure levels are expressed in logarithmic units called decibels (dB) to avoid a very large and awkward range in numbers. The sound-pressure level in decibels is calculated by taking the log of the ratio between the actual sound pressure and the reference sound pressure, then multiplying by 20. The reference sound pressure is considered the absolute hearing threshold.[1] Using this logarithmic scale reveals that the total sound from two individual 65-dB sources is 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB).

Because the human ear is not equally sensitive to all audible frequencies, a frequency-dependent rating scale was devised to relate noise to human sensitivity. An A-weighted dB (i.e., dBA) scale performs this by deemphasizing the low-frequency sounds because humans are more sensitive to high frequency sounds. The basis for compensation is the faintest sound audible to the average ear at the frequency of maximum sensitivity. This scale has been chosen by most authorities for regulating environmental noise. Sound levels expressed as dB in this section are A-weighted sound levels, unless noted otherwise. Figure 4.6-2, "Typical Noise Levels," on page 4.6-4 presents typical indoor and outdoor noise levels.

[1] California Department of Transportation. 2009 (November). *Technical Noise Supplement.* Division of Environmental Analysis. Sacramento, CA. Prepared by ICF Jones & Stokes, Sacramento, CA. Page 2-8.



* dB are "average" values as measured on the A-scale of a sound-level meter.
From Concepts in Architectural Acoustics: M. David Egan, McGraw Hill, 1972 and U.S. Department of Housing and Urban Development, Office of Community Planning and Development "The Noise Guidebook."

Source: Data compiled by AECOM in 2009

Typical Noise Levels **Figure 4.6-2**

With respect to how humans perceive and react to changes in noise levels, a 1-dB increase is imperceptible, a 3-dB increase is barely perceptible, a 6-dB increase is clearly noticeable, and a 10-dB increase is subjectively perceived as approximately twice as loud[2] (see Table 4.6-1, "Subjective Reaction to Changes in Noise Levels of Similar Sources," below). The list in Table 4.6-1, depicting subjective reactions to changes in noise levels from similar sources, was developed from test subjects' reactions to changes in the levels of steady-state pure tones or broadband noise and to changes in levels of a given noise source. This information is probably most applicable to noise levels ranging from 50 to 70 dB, the usual range of voice and interior-noise levels. For these reasons, a noise-level increase of 3 dB or more is typically considered a substantial degradation of the existing noise environment.

Table 4.6-1
Subjective Reaction to Changes in Noise Levels of Similar Sources

Change in Level (dB)	Subjective Reaction	Factor Change in Acoustical Energy
1	Imperceptible (except for tones)	1.3
3	Just barely perceptible	2.0
6	Clearly noticeable	4.0
10	About twice (or half) as loud	10.0

Note: dB = decibels
Source: Egan, M. D. 1988. *Architectural Acoustics.* New York, NY: McGraw-Hill, Inc. Page 21.

Sound Propagation and Attenuation

As sound (noise) propagates from the source to the receptor, the attenuation (manner of noise reduction in relation to distance) depends on surface characteristics, atmospheric conditions, and the presence of physical barriers. The inverse-square law describes the attenuation caused by the pattern in which sound travels from the source to receptor. Sound travels uniformly outward from a point source in a spherical pattern with an attenuation rate of 6 dB per doubling of distance (dB/DD). However, from a line source (e.g., a road), sound travels uniformly outward in a cylindrical pattern with an attenuation rate of 3 dB/DD.

The surface characteristics between the source and the receptor may result in additional sound absorption and/or reflection. Soft surfaces such as dirt cover or vegetation can provide an additional 1.5 dB/DD of attenuation. Hard surfaces such as parking lots, water, and other roadway surfaces would result in noise reflections with less attenuation over distance.

Atmospheric conditions such as wind speed, temperature, and humidity affect noise attenuation. The presence of a barrier between the source and the receptor may also attenuate noise levels. The actual amount of attenuation

[2] Egan, M. D. 1988. *Architectural Acoustics.* McGraw-Hill, Inc. New York, NY. Page 21.

depends on the size of the barrier and the frequency of the noise. A noise barrier may consist of any natural or human-made feature such as a hill, grove of trees, building, wall, or berm.[3]

All buildings provide some exterior-to-interior noise reduction. A building constructed with a wood frame and a stucco or wood sheathing exterior typically provides a minimum exterior-to-interior noise reduction of 25 dB with its windows closed. By contrast, a building constructed with a steel or concrete frame, a curtain wall or masonry exterior wall, and fixed plate-glass windows one-quarter inch thick typically provides an exterior-to-interior noise reduction of 30–40 dB with its windows closed.[4]

Noise Descriptors

The proper noise descriptor for a specific source depends on the noise's spatial and temporal distribution, duration, and amplitudinal fluctuation. The following noise descriptors are most often used to characterize traffic, community, and environmental noise:[5, 6]

- *L_{max} (maximum noise level):* The maximum instantaneous noise level during a specific period of time. The L_{max} may also be referred to as the "peak (noise) level."

- *L_{min} (minimum noise level):* The minimum instantaneous noise level during a specific period of time.

- *L_X (statistical descriptor):* The noise level exceeded X% of a specific period of time.

- *L_{eq} (equivalent noise energy level):* The energy mean (average) noise level. The instantaneous noise levels during a specific period of time in dB are converted to relative energy values. An average energy value is calculated from the sum of the relative energy values, then converted back to dB to determine the L_{eq}. In noise environments characterized by major noise events, such as aircraft overflights, the L_{eq} value is influenced heavily by the magnitude and number of single events that produce the high noise levels.

- *L_{dn} (day-night average noise level):* The 24-hour L_{eq} with a 10-dB "penalty" for noise events that occur during the noise-sensitive hours between 10 p.m. and 7 a.m. In other words, 10 dB is "added" to noise events that occur in the nighttime hours. For instance, a diesel truck passing by between 10 p.m. and 7 a.m. at 75 dB at 50 feet would have 10 dB added to the noise level, resulting in an 85-dB level being input into the overall L_{dn}

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[3] California Department of Transportation. 2009 (November). *Technical Noise Supplement.* Division of Environmental Analysis. Sacramento, CA. Prepared by ICF Jones & Stokes, Sacramento, CA. Page 2-39.

[4] Paul S. Veneklasen & Associates. 1973. *Noise Insulation Problems in Buildings.* Cited in California Department of Transportation. 2002 (January). *California Airport Land Use Planning Handbook.* Division of Aeronautics. Sacramento, CA. Prepared by Shutt Moen Associates, Santa Rosa, CA, in association with Brown-Buntin Associates and Gatzke, Dillon & Ballance. Page 7-37.

[5] California Department of Transportation. 2009 (November). *Technical Noise Supplement.* Division of Environmental Analysis. Sacramento, CA. Prepared by ICF Jones & Stokes, Sacramento, CA. Page 2-52.

[6] Lipscomb, D. M., and A. C. Taylor, Jr. 1978. *Noise Control Handbook of Principles and Practices.* New York, NY: Van Nostrand Reinhold Company. Page 65.

calculation. As a result, a higher noise level is reported when compliance with noise standards is determined. The L_{dn} attempts to account for the fact that noise during this specific period of time may result in disturbance during normal sleeping hours.

- *CNEL (community noise equivalent level):* A noise level similar to the L_{dn} described above, but with an additional 5-dB "penalty" added to noise events that occur during the noise-sensitive hours between 7 p.m. and 10 p.m., which are typically reserved for relaxation, conversation, reading, and television. If the same 24-hour noise data are used, the reported CNEL is typically approximately 0.5 dB higher than the L_{dn}.

Community noise is commonly described in terms of the ambient noise level, the all-encompassing noise level associated with a given noise environment. The L_{eq} represents a steady-state sound level that contains the same total energy as a time-varying signal over a given time period (usually 1 hour). The L_{eq} is the foundation of the composite noise descriptors defined above, such as L_{dn} and CNEL, and shows a positive correlation with community response to noise.

Negative Effects of Noise on Humans

Negative effects of noise exposure include physical damage to the human auditory system, interference, and disease. Physical damage to the auditory system can lead to gradual or traumatic hearing loss. Gradual hearing loss is caused by sustained exposure to moderately high noise levels over an extended period of time; traumatic hearing loss is caused by sudden exposure to extremely high noise levels over a brief period. Both gradual and traumatic hearing loss may result in permanent hearing damage. In addition, noise may interfere with or interrupt sleep, relaxation, recreation, and communication. Although most interference may be classified as annoying, the inability to hear a warning signal is considered dangerous. Noise may also contribute to diseases associated with stress, such as hypertension, anxiety, and heart disease. The degree to which noise contributes to such diseases depends on the frequency, bandwidth, noise level, and duration of exposure.[7]

The World Health Organization (WHO) has published research on community noise effects on health. The most current guidelines issued by the WHO for community noise levels are presented in Table 4.6-2, "World Health Organization–Recommended Community Noise Limits," on page 4.6-8.

The City and County of San Francisco (City) has incorporated WHO findings into the San Francisco Noise Control Ordinance. Please refer to Section 2900 of the ordinance, presented below under "City/Local" in Section 4.6.2, "Regulatory Framework," on page 4.6-30.

[7] California Department of Transportation. 2009 (November). *Technical Noise Supplement.* Division of Environmental Analysis. Sacramento, CA. Prepared by ICF Jones & Stokes, Sacramento, CA. Pages 2-63 through 2-66.

Table 4.6-2
World Health Organization–Recommended Community Noise Limits

Environment	Critical Health Effects	L_{eq} [h] (dB)	Time Length (hours)	L_{max} (dB)
Outdoor living area	Annoyance	55	16	–
Interior dwelling	Speech intelligibility, annoyance	35	16	–
Interior bedrooms	Sleep disturbance	30	8	45
Schools	Speech intelligibility	35	During class	–
Hospitals	Sleep and recovery disturbance	30	16	40
Industrial/commercial	Hearing impairment	70	24	110

Notes:
dB = decibels; h = hourly; L_{eq} = equivalent noise energy level; L_{max} = maximum noise level
Source: World Health Organization. 1999. *Guidelines for Community Noise.* Ed. B. Berglund, T. Lindvall, and D. H. Schwela. Cluster of Sustainable Development and Healthy Environment (SDE), Department of the Protection of the Human Environment (PHE), Occupational and Environmental Health (OEH). Geneva, Switzerland. Page 47.

Vibration

Vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structureborne noise. Both natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment) can result in groundborne vibration. Some vibration sources, such as factory machinery, are continuous; others, such as explosions, are transient. As is the case with airborne sound, groundborne vibration may be described by amplitude and frequency.

Vibration amplitude is typically expressed in peak particle velocity (PPV) or root mean square (RMS), as in RMS vibration velocity. The PPV and RMS velocity are normally described in inches per second (in/sec). PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is the metric often used to describe blasting vibration and other vibration sources that result in structural stresses in buildings.[8] Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. It takes some time for the human body to respond to vibration signals. In a sense, the human body responds to average vibration amplitude. The RMS of a signal is the average of the squared amplitude of the signal, typically calculated over a period of 1 second. As with airborne sound, the RMS velocity is often expressed in decibel notation as velocity decibels (VdB), which serves to compress the range of numbers

8 Federal Transit Administration. 2006 (May). *Transit Noise and Vibration Impact Assessment.* Washington, DC. Page 7-3.

required to describe vibration.[9] This velocity decibel scale is based on a reference value of 1 microinch per second (μin/sec).

The background vibration-velocity level typical of residential areas is approximately 50 VdB. Groundborne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels.[10] Table 4.6-3, "Human Response to Different Levels of Groundborne Vibration," below summarizes the general human response to different levels of groundborne vibration.

Table 4.6-3
Human Response to Different Levels of Groundborne Vibration

Vibration-Velocity Level (VdB)	Human Reaction
65	Approximate threshold of perception.
75	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85	Vibration acceptable only if there is an infrequent number of events per day.

Note: VdB = velocity decibels referenced to 1 microinch per second and based on the root mean square vibration velocity.
Source: Federal Transit Administration. 2006 (May). *Transit Noise and Vibration Impact Assessment*. Washington, DC. Page 7-8.

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 is rarely perceptible. Construction activities can generate groundborne vibrations, which can range from no perceptible effects at the lowest levels, to low rumbling sounds and perceptible vibrations at moderate levels, to slight damage at the highest levels. Ground vibrations from construction activities do not often reach levels that can cause damage to structures. A possible exception is fragile buildings, most of them old or historic, where special care must be taken to avoid damage.

Construction-generated vibration can be transient, random, or continuous. Transient construction vibration is generated by blasting, impact pile driving, and use of wrecking balls. Random vibration can result from the use of jackhammers, pavement breakers, and heavy construction equipment. Continuous vibration results from the use of vibratory pile drivers, large pumps, horizontal directional drilling, and compressors.

Noise- and Vibration-Sensitive Land Uses

Land uses that are sensitive to noise and vibration are those uses where noise and vibration exposure would result in adverse effects (i.e., injury or annoyance) and uses where lack of noise and vibration is an essential element of their intended purpose. In San Francisco, residences of all types are of primary concern because of the potential

[9] Federal Transit Administration. 2006 (May). *Transit Noise and Vibration Impact Assessment.* Washington, DC. Page 7-4.
[10] Ibid., page 7-5.

for increased, prolonged exposure of individuals to both interior and exterior noise and vibration. Other noise-sensitive land uses are schools, preschools, hospitals, convalescent facilities, hotels, motels, churches, libraries, and other uses where low interior noise levels are essential.

Residences, education buildings, and places of worship are also vibration-sensitive receptors because people can experience annoyance and fragile buildings may experience damage from groundborne vibration.[11] People typically experience annoyance when exposed to vibration that exceeds certain thresholds. These thresholds are generally lower than threshold levels for vibration-related building damage. Buildings that are normally occupied by people are considered sensitive to groundborne vibration. Historical or lightweight buildings are considered most vulnerable to vibration damage; thus, more stringent vibration-damage thresholds are recommended for these building types. Buildings used for research, manufacturing, or healthcare operations that are sensitive to very low thresholds of vibration to function effectively (e.g., magnetic resonance imaging [MRI] or microelectronics manufacturing facilities) are also considered vibration sensitive; groundborne vibration can result in structural damage and/or interfere with such buildings intended functions.[12]

Existing surrounding, or ambient, noise levels at all of the CPMC campuses are typical of noise levels in urban areas such as San Francisco, which are dominated by vehicular traffic (trucks, cars, San Francisco Municipal Railway [Muni] buses, and emergency vehicles). As described below, the CPMC campuses themselves contain (and are surrounded by) both noise-sensitive and vibration-sensitive land uses. Noise surveys were conducted at various campuses to document existing noise levels and sources. Long-term (24-hour continuous) and short-term (15-minute) noise measurements of noise levels were taken in accordance with American National Standards Institute (ANSI) standards using Larson Davis Laboratories Model 820 and 824 precision integrating sound-level meters. The sound-level meters were calibrated before and after use with a Larson Davis Laboratories Model CAL200 acoustical calibrator to ensure that the meters were measuring noise levels accurately. The equipment used meets all pertinent specifications of ANSI for Type 1 sound-level meters (ANSI S1.4-1983 [R2006]).

Traffic noise is the dominant noise source at each campus. Traffic counts were conducted during short term noise measurements to determine truck mix percentages and traffic noise model offset assumptions. Existing vehicle traffic noise levels in the vicinity of each campus were modeled using the Federal Highway Administration's (FHWA's) traffic noise prediction model (FHWA-RD-77-108) assuming flat topographical conditions and traffic data obtained from the traffic analysis prepared for this EIR (see Section 4.5, "Transportation and Circulation," beginning on page 4.5-1). The FHWA model is based on CALVENO reference noise factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, day/night percentages, vehicle mix percentages (autos, medium trucks, and heavy trucks), roadway configuration, and ground attenuation

[11] Ibid., pages 8-2 through 8-3.
[12] Ibid., page 8-2.

factors. Modeled L_{dn} noise levels at 50 feet from each roadway centerline and distances from the roadway centerlines to the 60-, 65-, and 70-dB L_{dn} contours for existing average daily traffic volumes derived from the p.m. peak volumes are shown in the tables below for each campus. Offsets (plus or minus dB) for future traffic noise modeling are based on a comparison of measured to modeled noise levels to account for surface reflections, roadway grade (excessive braking or accelerating), and operating speed. These factors may cause traffic noise levels to be higher than predicted by the noise model. Actual noise levels may vary from day to day depending on daily traffic-volume fluctuations, shielding from existing structures, variations in attenuation rates attributable to changes in surface parameters, and meteorological conditions.

CATHEDRAL HILL CAMPUS

The proposed Cathedral Hill Campus would be located on three sites, totaling 3.85 acres, in the Cathedral Hill area of San Francisco. The site of the proposed Cathedral Hill Hospital is located on the block bounded by Post Street to the north, Van Ness Avenue to the east, Geary Boulevard/Street to the south, and Franklin Street to the west. The proposed Cathedral Hill Medical Office Building (MOB) would be located across Van Ness Avenue from the hospital, and the proposed 1375 Sutter MOB would be located two blocks to the north at the intersection of Sutter and Franklin Streets.

Existing Noise- and Vibration-Sensitive Land Uses

The existing land uses in the vicinity of the proposed Cathedral Hill Campus are shown in Figure 4.1-1, “Cathedral Hill Campus—Surrounding Land Uses,” on page 4.1-2 in Section 4.1, “Land Use and Planning.” In general, the noise- and vibration-sensitive land uses located near the proposed Cathedral Hill Campus are the residential buildings on all four blocks surrounding the campus; Hamilton Square Baptist Church, located across Franklin Street at 1212 Geary Boulevard; the Montessori School of Children and First Unitarian Universalist Church & Center, located one block away at 1187 Franklin Street; the Cathedral of St. Mary, located two blocks away at 1111 Gough Street; St. Mark’s Lutheran Church, located two blocks away at 1111 O’Farrell Street; and the San Francisco Lighthouse Church, located 2 blocks away at 1337 Sutter Street.

More specifically, the noise-sensitive land uses closest to the site of the proposed Cathedral Hill Hospital are:

- residential uses within the 1 Daniel Burnham Court mixed-use complex, approximately 100 feet to the north;
- residential uses across Geary Boulevard, approximately 65 feet to the south; and
- Hamilton Square Baptist Church, approximately 80 feet to the west.

The noise- and vibration-sensitive land uses closest to the site of the proposed Cathedral Hill MOB are residential uses located across Cedar Street from the site, approximately 35 feet to the north (1142 Van Ness Avenue); and 1001 Polk Street, a residential building on the eastern end of the MOB site. Other noise-sensitive land uses near the Cathedral Hill MOB are other residential units on all four blocks surrounding the MOB site (including 990 Geary Street and 990 Polk Street), the Opal San Francisco Hotel at 1050 Van Ness Avenue, the Super 8 Motel at 1050 Geary Street, and the Pierce Arrow building at the corner of Geary Street and Polk Street.

The noise- and vibration-sensitive land uses closest to the site of the proposed 1375 Sutter MOB are residential uses at the mixed-use complex located at 1 Daniel Burnham Court, approximately 100 feet to the south and across Daniel Burnham Court, and at the San Francisco Lighthouse Church located at 1337 Sutter Street. Mixed uses are located north of Sutter Street and contain office, commercial, and residential uses. The Century Club of California, at 1355 Franklin Street, is west of the 1375 Sutter Street MOB.

Existing Noise and Vibration Sources

At present, both the Cathedral Hill Hotel and adjacent 1255 Post Street Building are vacant, and therefore generate little noise. Buildings on the site of the proposed Cathedral Hill MOB are occupied and generate some noise related to common urban noise sources in the area. Noise sources in the vicinity of the proposed Cathedral Hill Campus are typical of urban areas in San Francisco, such as vehicular traffic (e.g., motor sound, horns, braking sound, loudly played music systems), emergency vehicle sirens (police vehicles, ambulances and fire trucks) activity at loading docks (doors slamming, roller door sound, back-up beepers); operation of heating, ventilation, and air conditioning (HVAC) systems (motor start-up and running sounds, air pressure sound); dogs barking; people talking; and other miscellaneous neighborhood noise (e.g., music playing, garbage collection). All streets surrounding the Cathedral Hill Campus (with the exception of Cedar Street) are heavily traveled thoroughfares and thus are major sources of street noise. Vehicle traffic on Post Street, Van Ness Avenue, Geary Street/Geary Boulevard, and Franklin Street is the dominant source of vibration in the vicinity of the proposed Cathedral Hill Campus.

Existing-Noise Survey

To quantify the existing noise environment in the vicinity of the proposed Cathedral Hill Campus, five short-term (15-minute) and two long-term (24-hour) measurements of ambient noise were collected at the locations shown in Figure 4.6-3, “Noise Monitoring Locations—Cathedral Hill Campus” (page 4.6-13). All noise measurements were collected on Thursday and Friday, May 28 and May 29, 2009. Noise monitoring locations were chosen based on observations of the area’s noise sources and their proximity to proposed project features and existing noise-sensitive receptors. Noise sources noted during the measurements included city buses, commercial trucks, and passenger vehicles. Based on the short-term measurements, noise levels in the vicinity of the proposed Cathedral Hill Campus range from approximately 61 dB L_{eq} to 74 dB L_{eq}, with L_{max} ranges from 74 dB to 96 dB (see Table 4.6-4, “Existing Ambient Noise Levels—Cathedral Hill Campus,” on page 4.6-14).

Source: Data compiled by AECOM in 2009

Noise Monitoring Locations—Cathedral Hill Campus **Figure 4.6-3**

Table 4.6-4
Existing Ambient Noise Levels—Cathedral Hill Campus

Site	Location	Date/Time	Traffic Counts			A-Weighted Sound Level (dBA)			
			Autos	MT	HT	L_{eq}	L_{max}	L_{50}	L_{90}
ST-1	Geary Boulevard	May 28, 2009 12:23–12:38 p.m.	215	9	4	72.1	89.1	68	64
ST-2	Franklin Street	May 28, 2009 12:50–1:05 p.m.	448	6	4	74.4	96.2	70	62
ST-3	Post Street	May 29, 2009 8:59–9:14 a.m.	189	8	5	68.1	86.6	66	62
ST-4	Van Ness Avenue	May 29, 2009 9:28–9:43 a.m.	558	20	15	69.6	81.2	69	62
ST-5	Cedar Street	May 29, 2009 10:08–10:23 a.m.	3	0	0	60.8	74.3	60	57

Notes: dBA = A-weighted decibels; HT = Heavy Truck; L_{eq} = equivalent noise level; L_{max} = maximum noise level; L_n = noise level exceeded n% of a specific period of time; MT = Medium Truck
Monitoring locations correspond to those depicted in Figure 4.6-3, “Noise Monitoring Locations—Cathedral Hill Campus,” on page 4.6-13.
Source: Data collected by AECOM on May 28 and May 29, 2009.

At Locations A and B, shown in Table 4.6-5, “Existing 24-Hour Ambient Noise Levels—Cathedral Hill Campus” (page 4.6-15), 24-hour measurements were taken above street grade to capture noise levels at the heights of surrounding residences and proposed campus buildings. L_{dn} levels measured over 24 hours ranged from approximately 70 dB to 75 dB. The San Francisco Department of Public Health’s “Transportation Noise Map 2008” (SFDPH Noise Map) shows that the Cathedral Hill area has noise levels of 70–75 dB,[13] which is consistent with the noise measurements conducted. Thus, as noted in Figure 4.6-2, “Typical Noise Levels” (page 4.6-4), the exterior noise environment in the Cathedral Hill may be generally characterized as “moderately loud,” with occasional maximum noise reaching “very loud” levels.

Based on the observations and measurements and review of the SFDPH Noise Map, the noise levels measured during the existing-ambient-noise survey would be representative of typical noise levels in the Cathedral Hill Campus vicinity. Noise levels and sources at the Cathedral Hill MOB were assumed to be similar to those at ambient-noise-survey measurement sites, as confirmed by the SFDPH Noise Map. Although noise levels of 70–75 dB are high by human health standards, they are typical of San Francisco noise levels along higher volume traffic routes such as Van Ness Avenue and Geary Boulevard.[14]

[13] San Francisco Department of Public Health. 2008. Transportation Noise Map 2008. San Francisco, CA. Available: http://www.sfdph.org/dph/files/EHSdocs/ehsPublsdocs/Noise/TransitNoiseMap.pdf.

[14] Ibid.

Table 4.6-5
Existing 24-Hour Ambient Noise Levels—Cathedral Hill Campus

Site	Location	Date	Average Measured Hourly Noise Levels, dBA								
				Daytime (7 a.m.–10 p.m.)				Nighttime (10 p.m.–7 a.m.)			
			L_{dn}	L_{eq}	L_{max}	L_{50}	L_{90}	L_{eq}	L_{max}	L_{50}	L_{90}
LT-A	Geary Street—third-floor rooftop	May 28–29, 2009	74.9	69.9	86.7	66.4	63.5	68.3	80.5	64.2	59.1
LT-B	Post Street—11th-floor catwalk	May 28–29, 2009	70.3	66.4	82.7	64.8	62.7	63.3	76.3	61.0	57.9

Notes: dB = A-weighted decibels; L_{dn} = day-night average noise level; L_{eq} = the equivalent hourly average noise level; L_{max} = maximum noise level; L_{50} = the noise level exceeded 50% of a specific period of time; L_{90} = the noise level exceeded 90% of a specific period of time.
Monitoring locations correspond to those depicted in Figure 4.6-3, "Noise Monitoring Locations—Cathedral Hill Campus," on page 4.6-13.
Source: Data collected by AECOM on May 28 and 29, 2009

Existing Traffic Noise Levels

Existing traffic noise levels for roadways in the vicinity of the proposed Cathedral Hill Campus were modeled and are presented in Table 4.6-6, "Summary of Modeled Noise Levels from Existing Vehicular Traffic—Cathedral Hill Campus" (page 4.6-16). Based on the land use compatibility standards (see the discussion of the General Plan under "City/Local" in Section 4.6.2, "Regulatory Framework," page 4.6-30), any sensitive receptor located within the 60-dB or higher traffic noise contour listed in Table 4.6-6 is considered to be exposed to excessive traffic noise levels. Existing traffic noise level data in Table 4.6.2 indicate that almost all sensitive receptors in the vicinity of the Cathedral Hill Campus are exposed to excessive traffic noise (60 dB) at the building exterior.

As stated above, traffic noise is the dominant existing noise source in the campus area and is expected to remain the dominant noise source in the future. The existing traffic noise modeling assumes flat topographical conditions and adjustments were not made to account for site-specific roadway configuration, operating speeds, or topography. Based on comparisons of measured to modeled traffic noise levels, operating speed, roadway grade, truck mix percentages, surface parameters, and receptor elevation, offsets were assumed for future traffic noise modeling. Offsets for future traffic noise modeling were assumed as follows: +1 dB for Post Street; +3 dB for Franklin Avenue, Geary Boulevard, and Van Ness Avenue; and +5 dB for Cedar Street.

PACIFIC CAMPUS

The Pacific Campus is located in the Pacific Heights neighborhood. The main campus block is bounded by Clay Street to the north, Buchanan Street to the east, Sacramento Street to the south, and Webster Street to the west.

Table 4.6-6
Summary of Modeled Noise Levels from Existing Vehicular Traffic—Cathedral Hill Campus

Roadway	From	To	Distance (feet) from Roadway Centerline to L_{dn}			L_{dn} (dB) 50 Feet from Centerline of Roadway Segment
			70 dB L_{dn}	65 dB L_{dn}	60 dB L_{dn}[1]	
Franklin Street	Bush Street	Sutter Street	40	127	**401**	69
Franklin Street	Sutter Street	Post Street	39	123	**388**	69
Franklin Street	Post Street	Geary Blvd.	42	133	**421**	69
Franklin Street	Geary Blvd.	O'Farrell Street	47	148	**468**	70
Van Ness Avenue	Sutter Street	Post Street	43	136	**430**	69
Van Ness Avenue	Post Street	Geary Blvd.	46	144	**455**	70
Van Ness Avenue	Geary Blvd.	O'Farrell Street	47	150	**473**	70
Polk Street	Post Street	Cedar Street	12	38	**121**	64
Polk Street	Cedar Street	Geary Blvd.	12	39	**123**	64
Polk Street	Geary Blvd.	O'Farrell Street	11	34	**108**	63
Sutter Street	Gough Street	Franklin Street	11	34	**108**	63
Sutter Street	Franklin Street	Van Ness Avenue	13	42	**134**	64
Post Street	Gough Street	Franklin Street	8	26	**84**	62
Post Street	Franklin Street	Van Ness Avenue	12	37	**116**	64
Post Street	Van Ness Avenue	Polk Street	10	31	**98**	63
Geary Blvd.	Gough Street	Franklin Street	38	122	**385**	69
Geary Blvd.	Franklin Street	Van Ness Avenue	18	57	**179**	66
Geary Blvd.	Van Ness Avenue	Polk Street	16	51	**162**	65
Cedar Street	Polk Street	Van Ness Avenue	0	1	**3**	48

Notes:
dB = decibels; L_{dn} = day-night noise level. Calculated noise levels are conservative because they do not consider any shielding or reflection of noise by existing structures, vegetation, or terrain features, or noise contribution from other sources. Modeling information is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

[1] **Boldface** indicates the maximum distance from roadway centerlines at which sensitive receptors could be exposed to excessive traffic noise, based on the land use compatibility standards in the *San Francisco General Plan*.

Source: Modeling performed by AECOM in 2010

Additional CPMC campus buildings are located on the blocks directly to the north, south, west, northwest, and southwest.

Existing Noise- and Vibration-Sensitive Land Uses

The existing land uses in the vicinity of the Pacific Campus are shown in Figure 4.1-4, "Pacific Campus—Surrounding Land Uses," on page 4.1-12 in Section 4.1, "Land Use and Planning." The on-campus noise and vibration-sensitive uses include the 2333 Buchanan Street Hospital, Pacific Professional Building (2100 Webster Street), Stanford Building (2351 Clay Street), 2400 Clay Street MOB, and Gerbode Research Building (2200 Webster Street). The Pacific Campus is surrounded by noise- and vibration-sensitive residential uses. The closest of these residences are along the south side of Washington Street between Webster Street and Buchanan Street, on the same block as the 2400 Clay Street MOB, approximately 50 feet north of the campus boundary. Other noise-sensitive receptors in the campus vicinity include the University of the Pacific building at 2155 Webster Street, directly across from the campus; the San Francisco Japanese Seventh-Day Adventist Church, located one block north at 2409 Washington Street; and the Marin Day School–Congregation Sherith Israel, located one block south at 2266 California Street.

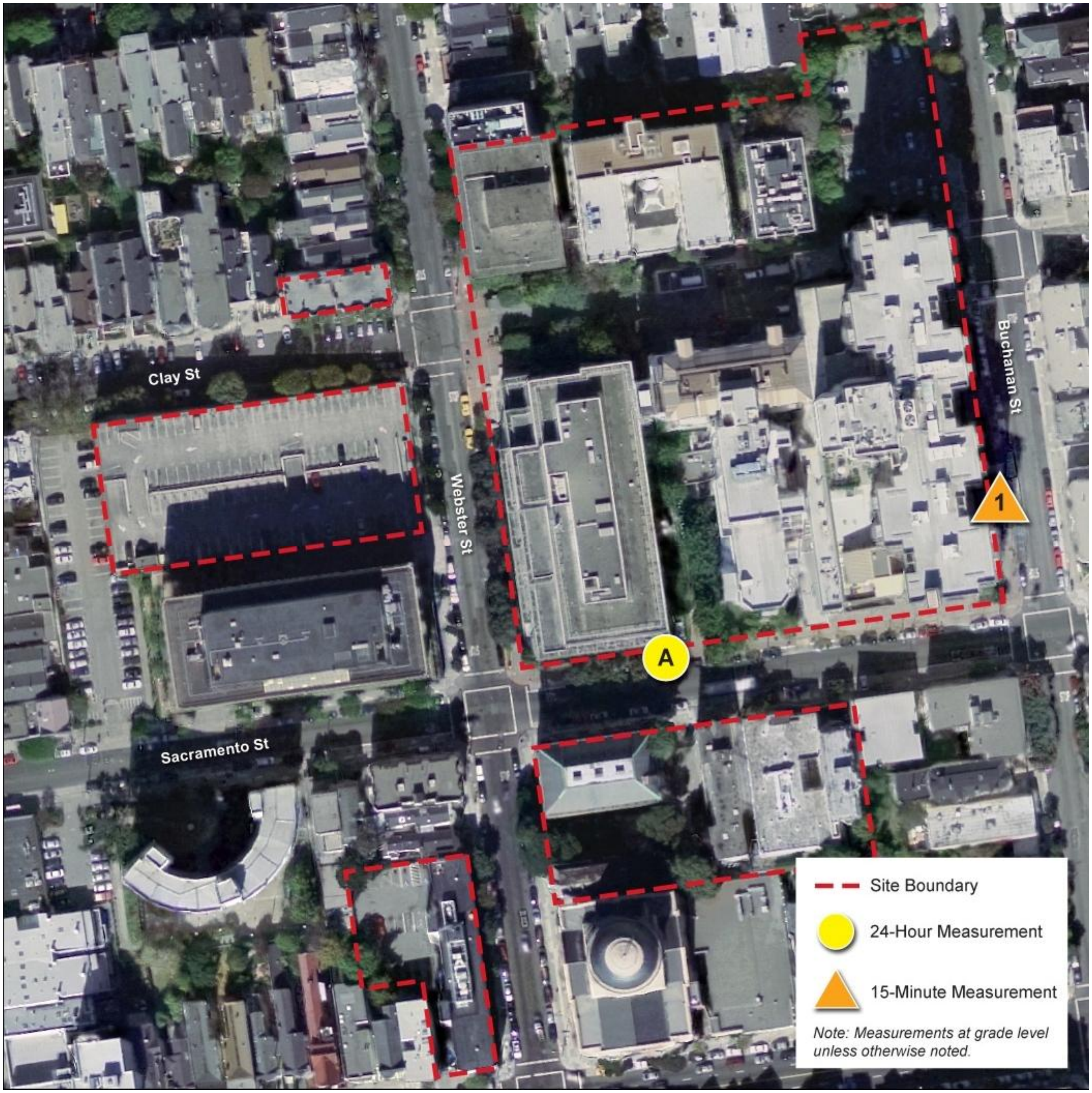
Existing Noise and Vibration Sources

The existing uses on the Pacific Campus, which include activity at loading docks, operation of HVAC systems, and on-campus movements by delivery vehicles, generate noise at the campus along with other noise sources (especially vehicular traffic) in the vicinity. Emergency vehicle sirens (ambulances) are characteristic in the general vicinity of the hospital and can produce short-term noise up to 106 dB, but normal practice is for the ambulance driver to turn off the siren within a few blocks of the hospital emergency access on Clay Street. Vehicle traffic on Webster, Buchanan, and Sacramento Streets is expected to be the dominant source of vibration in the vicinity of the Pacific Campus.

Existing-Noise Survey

To quantify the existing noise environment in the vicinity of the Pacific Campus, one short-term (15-minute) noise measurement and one long-term (24-hour) measurement were collected at the locations shown in Figure 4.6-4, “Noise Monitoring Locations—Pacific Campus” (page 4.6-18). Measurements were collected on Monday and Tuesday, June 29 and June 30, 2009. Noise monitoring locations were chosen based on observations of the area’s noise sources and their proximity to project features and noise-sensitive receptors. Based on these measurements, average noise levels in the vicinity of the Pacific Campus is approximately 60 dB L_{eq}, with maximum noise levels of approximately 81 dB (see Table 4.6-7, “Existing Ambient Noise Levels—Pacific Campus,” on page 4.6-19). Based on these data and compared to typical noise levels (Figure 4.6-2, page 4.6-4), the exterior noise environment of the Pacific Campus is “quiet” with occasional maximum noise that is “moderately loud.”

The Location A measurement, shown in Table 4.6-8, “Existing 24-Hour Ambient Noise Levels—Pacific Campus,” was taken along Sacramento Street. The L_{dn} level measured by the 24-hour measurement was approximately 65 dB. Noise sources noted during the measurements included city buses, commercial trucks, and passenger vehicles. The SFDPH Noise Map shows that the Pacific Campus area has noise levels of approximately



Source: Data compiled by AECOM in 2009

Noise Monitoring Locations—Pacific Campus **Figure 4.6-4**

Table 4.6-7
Existing Ambient Noise Levels—Pacific Campus

Site	Location	Date/Time	Traffic Counts			A-Weighted Sound Level (dBA)			
			Autos	MT	HT	L_{eq}	L_{max}	L_{50}	L_{90}
ST-1	Buchanan Street	June 30, 2009 2:10–2:25 p.m.	63	4	0	60.3	81.1	58	55

Notes: dBA = A-weighted decibels; L_{eq} = equivalent noise level; L_{max} = maximum noise level; L_n = noise level exceeded n percent of a specific period of time; MT = Medium Truck; HT = Heavy Truck
Monitoring locations correspond to those depicted in Figure 4.6-4, "Noise Monitoring Locations—Pacific Campus," on page 4.6-18.
Source: Data collected by AECOM on June 30, 2009.

Table 4.6-8
Existing 24-Hour Ambient Noise Levels—Pacific Campus

Site	Location	Date	Average Measured Hourly Noise Levels, dBA								
				Daytime (7 a.m.–10 p.m.)				Nighttime (10 p.m.–7 a.m.)			
			L_{dn}	L_{eq}	L_{max}	L_{50}	L_{90}	L_{eq}	L_{max}	L_{50}	L_{90}
LT-A	Sacramento Street—Street Level	6/29/09–6/30/09	64.5	62.3	80.8	57.4	53.5	56.6	74.5	51.5	50.0

Notes: dB = A-weighted decibels; L_{dn} = day-night average noise level; L_{eq} = the equivalent hourly average noise level; L_{max} = maximum noise level; L_{50} = the noise level exceeded 50% of a specific period of time; L_{90} = the noise level exceeded 90% of a specific period of time.
Monitoring locations correspond to those depicted in Figure 4.6-4, "Noise Monitoring Locations—Pacific Campus," on page 4.6-18.
Source: Data collected by AECOM on June 29 and 30, 2009

70 dB,[15] which is approximately 5 dB louder than the noise levels measured for this EIR and would be rated "moderately loud" on the scale of typical noise levels (Figure 4.6-2, page 4.6-4).

Based on the observations and measurements, the noise levels measured during the existing-ambient-noise survey are representative of typical noise levels in the Pacific Campus vicinity. Although noise levels of 65 dB are considered barely acceptable by human health standards, they are average or lower than the typical noise levels in the area as depicted by the SFDPH Noise Map.[16]

Existing Traffic Noise Levels

Existing traffic noise levels for the roadways in the vicinity of the Pacific Campus were modeled and are presented below in Table 4.6-9, "Summary of Modeled Noise Levels from Existing Vehicular Traffic—Pacific

[15] San Francisco Department of Public Health. 2008. Transportation Noise Map 2008. San Francisco, CA. Available: http://www.sfdph.org/dph/files/EHSdocs/ehsPublsdocs/Noise/TransitNoiseMap.pdf.

[16] Ibid.

Table 4.6-9
Summary of Modeled Noise Levels from Existing Vehicular Traffic—Pacific Campus

Roadway	From	To	Distance (feet) from Roadway Centerline to L_{dn}			L_{dn} (dB) 50 Feet from Centerline of Roadway Segment
			70 dB L_{dn}	65 dB L_{dn}	60 dB L_{dn}[1]	
Fillmore Street	Clay Street	Sacramento Street	9	28	88	63
Webster Street	Washington Street	Clay Street	6	18	58	61
Webster Street	Clay Street	Sacramento Street	10	30	95	63
Webster Street	Sacramento Street	California Street	10	33	105	63
Buchanan Street	Washington Street	Clay Street	6	18	56	601
Buchanan Street	Clay Street	Sacramento Street	6	18	56	61
Buchanan Street	Sacramento Street	California Street	5	16	52	60
Washington Street	Webster Street	Buchanan Street	3	8	26	57
Clay Street	Fillmore Street	Webster Street	4	13	40	59
Clay Street	Webster Street	Buchanan Street	1	2	6	51
Sacramento Street	Fillmore Street	Webster Street	7	21	65	61
Sacramento Street	Webster Street	Buchanan Street	6	18	57	61
California Street	Webster Street	Buchanan Street	18	58	184	66

Notes: dB = decibels; L_{dn} = day-night noise level. Calculated noise levels are conservative because they do not consider any shielding or reflection of noise by existing structures, vegetation, or terrain features; or noise contribution from other sources.

[1] **Boldface** indicates the maximum distance from roadway centerlines at which sensitive receptors could be exposed to excessive traffic noise, based on the land use compatibility standards in the *San Francisco General Plan.*

Source: Modeling performed by AECOM in 2010.

Campus." Based on the land use compatibility standards (see the discussion of the General Plan under "City/Local" in Section 4.6.2, "Regulatory Framework," page 4.6-30), any sensitive receptor located within the 60-dB noise contour shown in Table 4.6-9 is considered to be exposed to excessive traffic noise.

Data in Table 4.6-9 indicate that all of the sensitive receptors on the Pacific Campus and off-campus receptors at the University of the Pacific building, as well as residences on Webster Street, Sacramento Street, and Buchanan Street, are within the 60-dB noise zone related to excessive traffic noise exposure at their building exteriors. As stated above, traffic noise is the dominant existing noise source in the campus area and is expected to remain the dominant noise source in the future. The existing traffic-noise modeling assumes flat conditions and adjustments were not made to reflect site-specific roadway configuration, operating speeds, or topography. Based on comparisons of measured to modeled traffic noise levels, operating speed, roadway grade, truck mix percentages, surface parameters and receptor elevation, offsets were assumed for future traffic noise modeling. A +2 dB offset was applied to all roadways adjacent to the Pacific Campus.

California Campus

The California Campus occupies an overall area of approximately 5 acres bordered by the Presidio Heights, Laurel Heights, and Jordan Park neighborhoods. The campus is generally bounded by Sacramento Street to the north, Maple Street to the east, California Street to the south, and Cherry Street to the west. The campus slopes downward in a southwest direction, with an approximately 30-foot elevation change from Sacramento Street to California Street, with Sacramento Street at the higher elevation.

Existing Noise- and Vibration-Sensitive Land Uses

The existing land uses in the vicinity of the California Campus are shown in Figure 4.1-7, "California Campus—Surrounding Land Uses," on page 4.1-18 in Section 4.1, "Land Use and Planning." The on-campus noise- and vibration-sensitive uses include the Sacramento Street East Campus Hospital, California Street Hospital, and the Sacramento Street MOB. The noise- and vibration-sensitive land uses located near the California Campus are the surrounding residential buildings and units on all four blocks surrounding the campus. The nearest of these buildings, at approximately 80 feet away, are the Claire Lilienthal Madison Campus, located one block west at 3950 Sacramento Street; and Presidio High School, one block north at 3839 Washington Street.

Existing Noise and Vibration Sources

Dominant noise sources near the California Campus are vehicles traveling on Sacramento and California Streets. The existing uses on the California Campus, which include activity at loading docks, operation of HVAC systems, and on-campus movements by delivery vehicles, also generate noise at the campus along with other noise sources in the vicinity. Vehicle traffic on Sacramento and California Streets is expected to be the dominant source of vibration in the vicinity of the California Campus.

Existing-Noise Survey

No noise measurements were conducted at the California Campus because, under the CPMC LRDP, this campus is scheduled for closure and no construction is planned there. Noise levels in the vicinity of the California Campus would be expected to be less than those measured at the other existing and proposed CPMC campuses, except that noise levels on the California Street frontage are expected to be similar to the noise level measured at the Sacramento Street frontage of the Pacific Campus (64.5 dB L_{dn}). The SFDPH Noise Map shows that the California Campus area has noise levels of 65 dB.[17] Based on those data and compared to typical noise levels (Figure 4.6-2, page 4.6-4), the exterior noise environment of the Pacific Campus is "quiet." Although noise levels

[17] San Francisco Department of Public Health. 2008. Transportation Noise Map 2008. San Francisco, CA. Available: http://www.sfdph.org/dph/files/EHSdocs/ehsPublsdocs/Noise/TransitNoiseMap.pdf.

of 65 dB are considered barely acceptable by human health standards, they are average or lower than the typical noise levels in the area as depicted by the SFDPH Noise Map.[18]

Existing Traffic Noise Levels

Existing traffic noise levels for roadways in the vicinity of the California Campus were modeled and are presented in Table 4.6-10, "Summary of Modeled Noise Levels from Existing Vehicular Traffic—California Campus." Based on the land use compatibility standards in the General Plan (see the discussion of the General Plan under "City/Local" in Section 4.6.2, "Regulatory Framework," page 4.6-30), any sensitive receptor located the 60-dB noise contour shown below in Table 4.6-10 is considered to be exposed to excessive traffic noise. Data in Table 4.6.10 indicate that all campus and surrounding sensitive receptors (except residences on Cherry and Maple Streets) are within the 60-dB noise zone related to exposure to excessive traffic noise at their building exteriors.

Table 4.6-10
Summary of Modeled Noise Levels from Existing Vehicular Traffic—California Campus

Roadway	From	To	Distance (feet) from Roadway Centerline to L_{dn}			L_{dn} (dB) 50 Feet from Centerline of Near Travel Lane
			70 dB L_{dn}	65 dB L_{dn}	60 dB L_{dn}[1]	
Arguello Blvd.	California Street	Lake Street	12	39	124	64
Cherry Street	California Street	Sacramento Street	3	11	35	58
Maple Street	California Street	Sacramento Street	2	8	25	57
Spruce Street	California Street	Sacramento Street	4	14	44	56
Sacramento Street	Cherry Street	Arguello Blvd.	6	18	58	61
Sacramento Street	Maple Street	Cherry Street	5	16	50	60
Sacramento Street	Spruce Street	Maple Street	6	18	57	61
California Street	Palm Avenue	Arguello Blvd.	23	72	229	67
California Street	Jordan Avenue	Palm Avenue	23	73	232	67
California Street	Commonwealth Avenue	Jordan Avenue	23	74	233	67
California Street	Parker Avenue	Commonwealth Avenue	20	64	203	66
California Street	Spruce Street	Parker Avenue	22	70	221	66

Notes: dB = decibels; L_{dn} = day-night noise level. Calculated noise levels are conservative because they do not consider any shielding or reflection of noise by existing structures, vegetation, or terrain features; or noise contribution from other sources.
[1] **Boldface** indicates the maximum distance from roadway centerlines at which sensitive receptors could be exposed to excessive traffic noise.
Source: Modeling performed by AECOM in 2010.

[18] Ibid.

DAVIES CAMPUS

The Davies Campus is located in San Francisco's Duboce Triangle neighborhood, which is near the center of the city on the hilly slopes of Buena Vista between Duboce Avenue, Market Street, 14th Street, and Castro Street. The Davies Campus occupies a single lot on an entire block bounded by Duboce Avenue to the north, Noe Street to the east, 14th Street to the south, and Castro Street to the west. The campus is located on a block that slopes upward to the west. Noe Street and Castro Street, the eastern and western boundaries of the campus between Duboce Avenue and 14th Street, are relatively flat. Duboce Avenue rises steeply between Noe Street and Castro Street, with a 61-foot change in elevation.

Existing Noise- and Vibration-Sensitive Land Uses

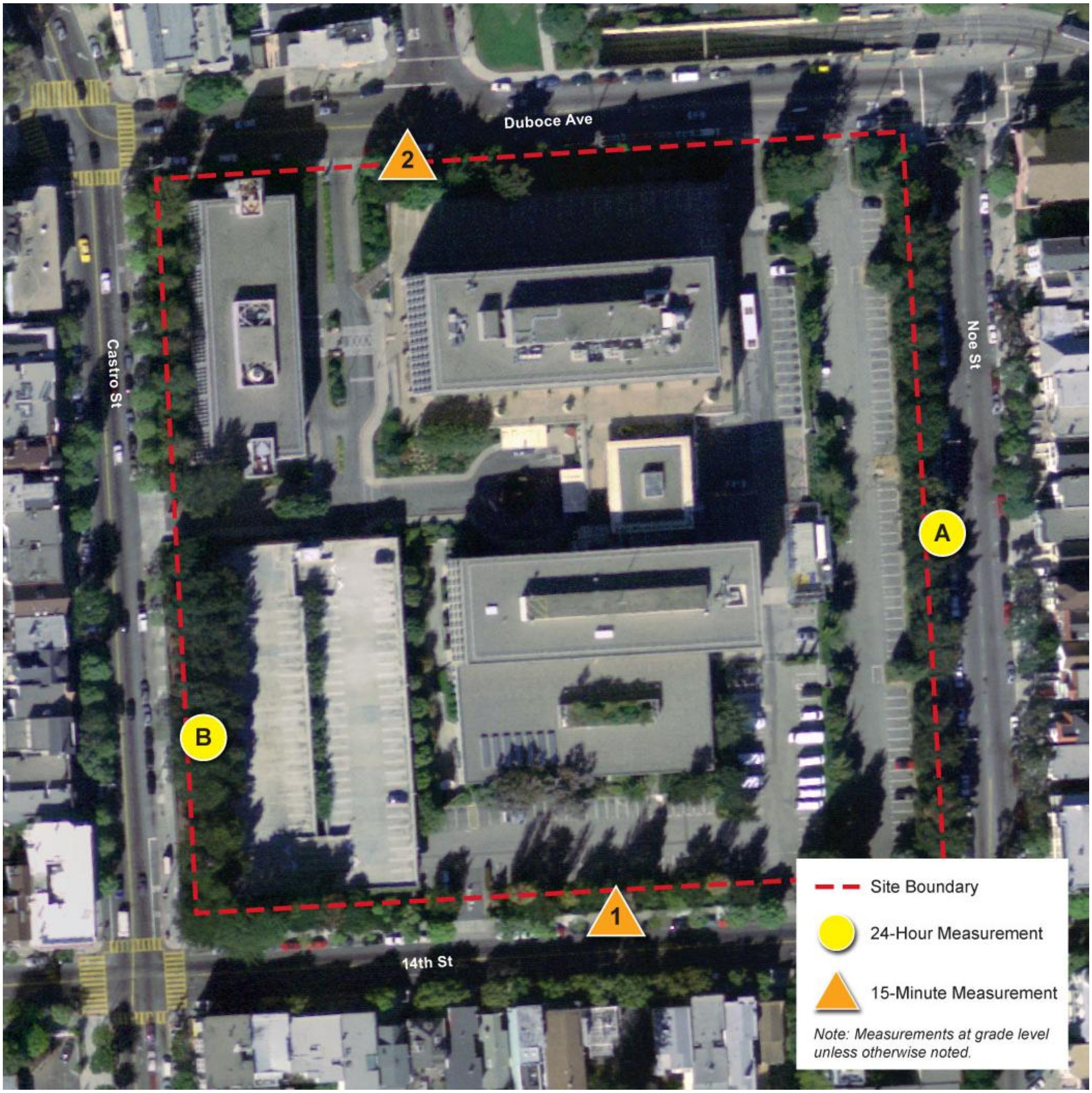
The existing land uses in the vicinity of the Davies Campus are shown in Figure 4.1-10, "Davies Campus—Surrounding Land Uses," on page 4.1-24 in Section 4.1, "Land Use and Planning." The noise- and vibration-sensitive land uses located near the Davies Campus are the existing Davies Hospital (North and South Towers and 45 Castro Street MOB) and residential buildings on the segments of Duboce Avenue and Noe, 14th, and Castro Streets that surround the campus. The closest of the nearby residences are along Noe Street, 14th Street, and Castro Street across from the Davies Campus, approximately 75–100 feet from campus buildings. Other nearby sensitive receptors include the Afterschool Enrichment Program, located one block west at 1025 14th Street.

Existing Noise and Vibration Sources

The existing uses on the Davies Campus, which include activity at loading docks, operation of HVAC systems, and on-campus movements by delivery vehicles, generate noise at the campus along with other noise sources (especially vehicular and light rail traffic) in the vicinity. Vehicle traffic on Castro Street, Duboce Avenue, and 14th Street is expected to be the dominant source of noise and vibration near the Davies Campus. In particular, Castro-Divisadero Street is a major north-south arterial that carries heavy automobile, truck, and bus traffic.

Existing-Noise Survey

To quantify the existing noise environment in the vicinity of the Davies Campus, two short-term (15-minute) noise measurements and two long-term (24-hour) measurements were collected at the locations shown in Figure 4.6-5, "Noise Monitoring Locations—Davies Campus" (page 4.6-24). Measurements were collected on Monday and Tuesday, June 29 and June 30, 2009. Noise monitoring locations were chosen based on observations of the area's noise sources and their proximity to project features and noise-sensitive receptors. Based on these measurements, average noise levels in the vicinity of the Davies Campus range from approximately 62 dB L_{eq} to 67 dB L_{eq}, and maximum noise levels range from approximately 75 dB to 89 dB L_{max} (see Table 4.6-11, "Existing Ambient Noise Levels—Davies Campus," page 4.6-25). Based on those data and compared to typical noise



Source: Data compiled by AECOM in 2009

Noise Monitoring Locations—Davies Campus **Figure 4.6-5**

Table 4.6-11
Existing Ambient Noise Levels—Davies Campus

Site	Location	Date/Time	Traffic Counts			A-Weighted Sound Level (dBA)			
			Autos	MT	HT	L_{eq}	L_{max}	L_{50}	L_{90}
ST-1	14th Street	June 30, 2009 1:18–1:33 p.m.	96	4	0	66.9	89.0	58	51
ST-2	Duboce Avenue	June 30, 2009 12:55–1:10 p.m.	98	3	0	62.0	74.6	58	54

Notes: dBA = A-weighted decibels; L_{eq} = equivalent noise level; L_{max} = maximum noise level; L_n = noise level exceeded n% of a specific period of time; MT = Medium Truck; HT = Heavy Truck Monitoring locations correspond to those depicted in Figure 4.6-5, "Noise Monitoring Locations—Davies Campus," on page 4.6-24.
Source: Data collected by AECOM on June 30, 2009

levels (Figure 4.6-2, page 4.6-4), the exterior noise environment of the Davies Campus is "quiet" to "moderately loud" with maximum noise level approaching "very loud."

Measurements at Locations A and B, shown in Table 4.6-12, "Existing 24-Hour Ambient Noise Levels—Davies Campus" below, were taken along Noe Street and Castro Street, respectively. The L_{dn} levels measured by the 24-hour measurements ranged from 61 dB to 69 dB. Noise sources noted during the measurements included Muni trains, back-up alarms, and passenger vehicles. The SFDPH Noise Map shows that the Davies Campus area has noise levels of approximately 65 dB,[19] which is consistent with the noise measurements conducted.

Table 4.6-12
Existing 24-Hour Ambient Noise Levels—Davies Campus

Site	Location	Date		Average Measured Hourly Noise Levels, dBA							
				Daytime (7 a.m.–10 p.m.)				Nighttime (10 p.m.–7 a.m.)			
			L_{dn}	L_{eq}	L_{max}	L_{50}	L_{90}	L_{eq}	L_{max}	L_{50}	L_{90}
LT-A	Noe Street	6/29/09–6/30/09	60.7	59.2	75.6	54.9	52.3	52.5	69.5	50.5	48.3
LT-B	Castro Street	6/29/09–6/30/09	69.3	65.7	82.3	62.7	57.0	62.2	77.8	55.1	50.2

Notes: dB = A-weighted decibels; L_{dn} = day-night average noise level; L_{eq} = equivalent hourly average noise level; L_{max} = maximum noise level; L_{50} = the noise level exceeded 50% of a specific period of time; L_{90} = the noise level exceeded 90% of a specific period of time.
Monitoring locations correspond to those depicted in Figure 4.6-5, "Noise Monitoring Locations—Davies Campus," on page 4.6-24.
Source: Data collected by AECOM on June 29 and June 30, 2009

Based on the observations and measurements, the noise levels measured during the existing-ambient-noise survey would be representative of typical noise levels in the Davies Campus vicinity. Although noise levels of 65 dB are

[19] San Francisco Department of Public Health. 2008. Transportation Noise Map 2008. San Francisco, CA. http://www.sfdph.org/dph/files/EHSdocs/ehsPublsdocs/Noise/TransitNoiseMap.pdf.

considered barely acceptable by human health standards, they are average or lower than the typical noise levels in the area as depicted by the SFDPH Noise Map.[20]

Existing Traffic Noise Levels

Existing traffic noise levels for the roadways in the vicinity of the Davies Campus were modeled and are presented below in Table 4.6-13, "Summary of Modeled Noise Levels from Existing Vehicular Traffic—Davies Campus." Based on the land use compatibility standards (see the discussion of the General Plan under "City/Local" in Section 4.6.2, "Regulatory Framework," page 4.6-30), any sensitive receptor located within the 60-dB noise contour shown below in Table 4.6-13 is considered to be exposed to excessive traffic noise.

Table 4.6-13
Summary of Modeled Noise Levels from Existing Vehicular Traffic—Davies Campus

Roadway	From	To	Distance (feet) from Roadway Centerline to L_{dn}			L_{dn} (dB) 50 Feet from Centerline of the Roadway Segment
			70 dB L_{dn}	65 dB L_{dn}	60 dB L_{dn}[1]	
Castro Street	Haight Street	Duboce Avenue	24	76	**241**	67
Castro Street	Duboce Avenue	14th Street	23	72	**227**	67
Castro Street	14th Street	Market Street	22	70	**220**	66
Noe Street	Duboce Avenue	14th Street	8	24	**76**	62
Duboce Avenue	Castro Street	Scott Street	6	19	**59**	61
Duboce Avenue	Scott Street	Noe Street	9	27	**85**	62
Duboce Avenue	Noe Street	Sanchez Street	5	16	**50**	60
14th Street	Castro Street	Noe Street	7	22	**70**	61
14th Street	Noe Street	Market Street	8	25	**79**	62

Notes:
dB = decibels; L_{dn} = day-night noise level. Calculated noise levels are conservative because they do not consider any shielding or reflection of noise by existing structures, vegetation, or terrain features; or noise contribution from other sources.
[1] **Boldface** indicates the maximum distance from roadway centerlines at which sensitive receptors could be exposed to excessive traffic noise.
Source: Modeling performed by AECOM in 2010

As stated above, traffic noise is the dominant existing noise source in the campus area and is expected to remain the dominant noise source in the future. The existing traffic noise modeling assumes flat conditions and adjustments were not made to reflect site-specific roadway configuration, operating speeds, or topography. Based on comparisons of measured to modeled traffic noise levels, operating speed, roadway grade, truck mix percentages, surface parameters and receptor elevation, offsets were assumed for future traffic noise modeling. A +1 dB offset was applied to all roadways adjacent to the Davies Campus. These data indicate that all campus

[20] Ibid.

and off-site surrounding sensitive-receptor residences are within the 60-dB noise zone related to excessive traffic noise at their building exteriors and with direct exposure to users in Duboce Park.

ST. LUKE'S CAMPUS

The irregularly shaped St. Luke's Campus site is bounded by Cesar Chavez Street to the north, Valencia Street to the east, Duncan Street to the south, and San Jose Avenue to the west. The campus also contains a surface parking lot west of San Jose Avenue that occupies a portion of the block generally bounded by Cesar Chavez Street to the north, San Jose Avenue to the east, 27th Street to the south, and Guerrero Street to the west. The campus is occupied by eight distinct structures of varying heights and ages, some linked by enclosed connectors and others freestanding.

Existing Noise- and Vibration-Sensitive Land Uses

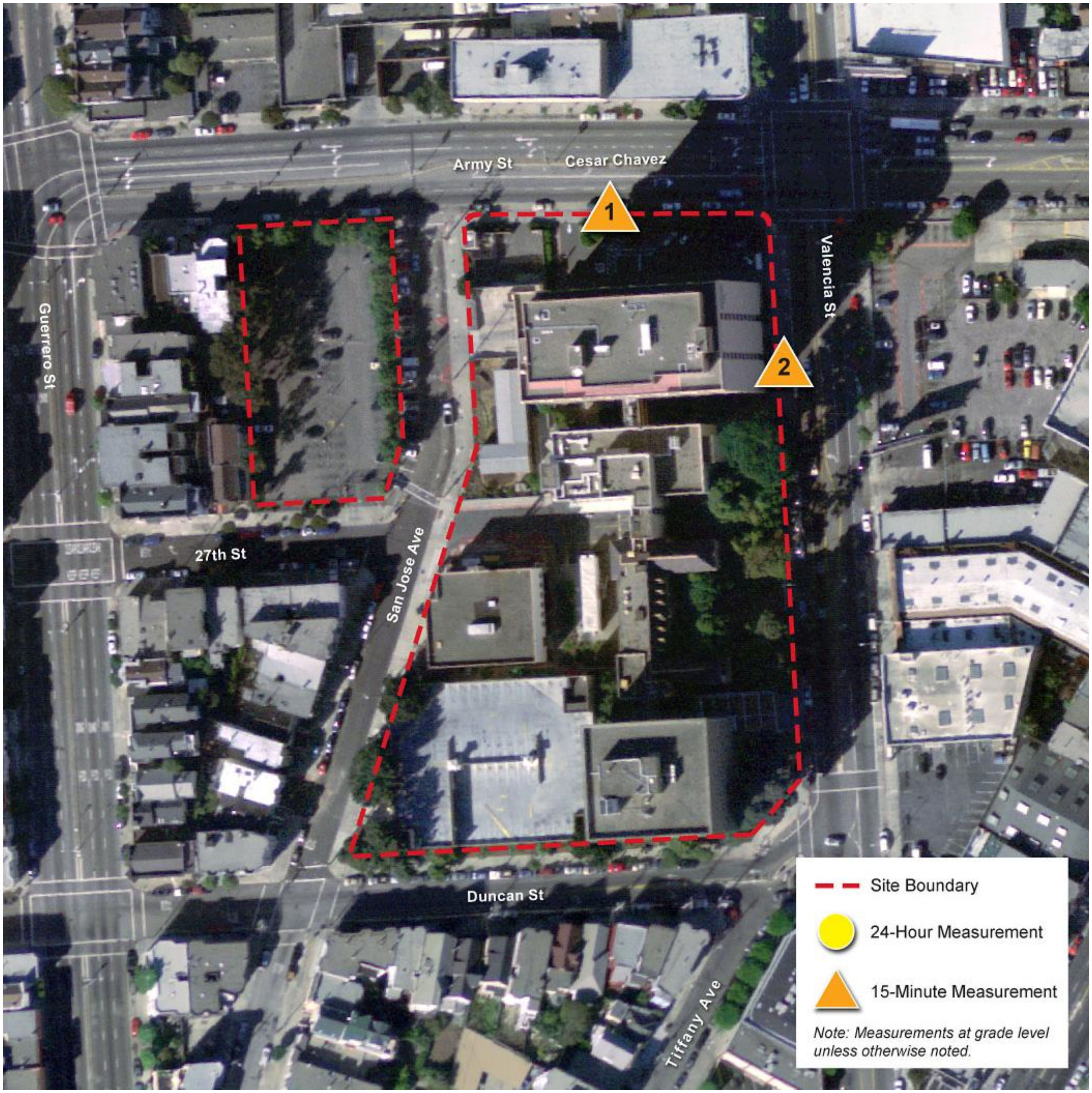
The existing land uses in the vicinity of the St. Luke's Campus are shown in Figure 4.1-13, "St. Luke's Campus—Surrounding Land Uses," on page 4.1-29 in Section 4.1, "Land Use and Planning." On-site noise- and vibration-sensitive land uses would include the St. Luke's Hospital tower, St. Luke's 1957 and 1912 Buildings, the Redwood Administration building, and the Hartzell Building. The noise- and vibration-sensitive land uses located near the campus are the surrounding residential buildings and units on San Jose Avenue and Duncan and Guerrero Streets. The closest of these residences are along San Jose Avenue and Duncan Street across from the St. Luke's Campus, approximately 75 feet from campus buildings. Other noise-sensitive receptors near the St. Luke's Campus include the Community of St. Francis, located two blocks west at 3743 Cesar Chavez Street; and the First Church of God, two blocks west at 3728 Cesar Chavez Street.

Existing Noise and Vibration Sources

Vehicles traveling on segments of San Jose Avenue and 27th Street adjacent to the campus, including ambulance and service/delivery vehicles, are noise sources at St. Luke's along with other noise sources in the vicinity. The existing uses on the St. Luke's Campus, which include activity at loading docks, operation of HVAC systems, and on-campus movements by delivery vehicles, also generate noise at the campus. Vehicle traffic on Cesar Chavez, Valencia, Duncan, and Guerrero Streets are expected to be the dominant source of vibration near the St. Luke's Campus. Cesar Chavez, Guerrero, and Valencia Streets are heavily used by automobile, truck, and bus traffic.

Existing-Noise Survey

To quantify the existing noise environment in the vicinity of the St. Luke's Campus, two short-term (15-minute) noise measurements were collected on Tuesday, June 30, 2009, at the locations shown in Figure 4.6-6, "Noise Monitoring Locations—St. Luke's Campus" (page 4.6-28). Noise monitoring locations were chosen based on observations of the area's noise sources and their proximity to project features and noise-sensitive receptors.



Source: Data compiled by AECOM in 2009

Noise Monitoring Locations—St. Luke's Campus **Figure 4.6-6**

Based on these measurements, average noise levels in the vicinity of the St. Luke's Campus range from approximately 64 dB L_{eq} to 65 dB L_{eq} and maximum noise levels range from 77 dB L_{max} to 78 dB L_{max} (see Table 4.6-14, "Existing Ambient Noise Levels—St. Luke's Campus," below). Noise sources noted during the measurements included people walking and passenger vehicles. The SFDPH Noise Map shows that the St. Luke's Campus area has noise levels of approximately 70 dB,[21] which is approximately 5 dB louder than the noise levels measured for this EIR. Based on these data and compared to typical noise levels (Figure 4.6-2, page 4.6-4), the exterior noise environment of the St. Luke's Campus is "quiet" with maximum noise level in the "moderately loud" level.

Table 4.6-14
Existing Ambient Noise Levels—St. Luke's Campus

Site	Location	Date/Time	Traffic Counts			A-Weighted Sound Level (dBA)			
			Autos	MT	HT	L_{eq}	L_{max}	L_{50}	L_{90}
ST-1	Cesar Chavez Street	June 30, 2009 10:52–11:07 p.m.	287	10	2	64.6	76.9	63	59
ST-2	Valencia Street	May 28, 2009 12:50–1:05 p.m.	143	6	2	64.1	78.2	61	57

Notes: dBA = A-weighted decibels; HT = Heavy Truck; L_{eq} = equivalent noise level; L_{max} = maximum noise level; L_n = noise level exceeded n% of a specific period of time; MT = Medium Truck. Monitoring locations correspond to those depicted in Figure 4.6-6, "Noise Monitoring Locations—St Luke's Campus," on page 4.6-28.
Source: Data collected by AECOM on June 30, 2009

Based on the observations and measurements, the noise levels measured during the existing-ambient-noise survey would be representative of typical noise levels in the St. Luke's Campus vicinity. Although noise levels of 65 dB are considered barely acceptable by human health standards, they are average or lower than the typical noise levels in the area as depicted by the SFDPH Noise Map.[22]

Existing Traffic Noise Levels

Existing traffic noise levels for the roadways in the vicinity of the St. Luke's Campus were modeled and are presented in Table 4.6-15, "Summary of Modeled Noise Levels from Existing Vehicular Traffic—St. Luke's Campus." Based on the land use compatibility standards in the General Plan (see the discussion of the General Plan under "City/Local" in Section 4.6.2, "Regulatory Framework," page 4.6-30), any sensitive receptor located within the 60-dB noise contour shown below in Table 4.6-15 is considered to be exposed to excessive traffic noise.

[21] San Francisco Department of Public Health. 2008. Transportation Noise Map 2008. San Francisco, CA. Available: http://www.sfdph.org/dph/files/EHSdocs/ehsPublsdocs/Noise/TransitNoiseMap.pdf.
[22] Ibid.

Table 4.6-15
Summary of Modeled Noise Levels from Existing Vehicular Traffic—St. Luke's Campus

Roadway	From	To	Distance (feet) from Roadway Centerline to L_{dn}			L_{dn} (dB) 50 Feet from Centerline of the Roadway Segment
			70 dB L_{dn}	65 dB L_{dn}	60 dB L_{dn}[1]	
Valencia Street	26th Street	Cesar Chavez Street	15	46	146	65
Valencia Street	Cesar Chavez Street	Duncan Street	10	30	95	63
Valencia Street	Duncan Street	Mission Street	9	29	90	63
Cesar Chavez Street	Guerrero Street	Valencia Street	28	90	285	68
Cesar Chavez Street	Valencia Street	Bartlett Street	30	96	305	68
27th Street	Guerrero Street	San Jose Avenue	1	4	12	54
Duncan Street	Guerrero Street	Valencia Street	2	7	23	57

Notes: dB = decibels; L_{dn} = day-night noise level. Calculated noise levels are conservative because they do not consider any shielding or reflection of noise by existing structures, vegetation, or terrain features; or noise contribution from other sources.

[1] **Boldface** indicates the maximum distance from roadway centerlines at which sensitive receptors could be exposed to excessive traffic noise.

Source: Modeling performed by AECOM in 2010

Data in Table 4.6-15 indicate that all campus and off-site surrounding sensitive-receptor residences are within the 60-dB noise zone related to excessive traffic noise at the building exterior, with the exception of those residences on Duncan Street and 27th Street. As stated above, traffic noise is the dominant existing noise source in the campus area and is expected to remain the dominant noise source in the future. The existing traffic noise modeling assumes flat conditions, and adjustments were not made to reflect site-specific roadway configuration, operating speeds, or topography. The campus is located on flat to gently sloping land. Based on comparisons of measured to modeled traffic noise levels, operating speed, roadway grade, truck mix percentages, surface parameters, and receptor elevation, offsets were assumed for future traffic noise modeling. A +2 dB offset was applied to Cesar Chavez Street.

4.6.2 REGULATORY FRAMEWORK

FEDERAL

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control was originally established to coordinate federal noise control activities. After inception, EPA's Office of Noise Abatement and Control issued the Federal Noise Control Act of 1972, establishing programs and guidelines to identify and address the effects of noise on public health and welfare, and the environment. A summary of recommended guidelines for noise levels considered safe for community exposure without the risk of adverse health or welfare effects are presented below in Table 4.6-16, "Summary of EPA-Recommended Noise Level Standards."[23] To prevent hearing loss over the lifetime of a receptor, the yearly average L_{eq} should not exceed 70 dBA, and the L_{dn} should not exceed 55 dBA in outdoor activity areas or 45 dBA indoors to prevent interference and annoyance.

Table 4.6-16
Summary of EPA-Recommended Noise Level Standards

Effect	Level	Area
Hearing loss	$L_{eq(24)} \leq 70$ dB	All areas
Outdoor activity interference and annoyance	$L_{dn} \leq 55$ dB	Outdoor in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	$L_{eq(24)} \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{eq} \leq 45$ dB	Indoor residential areas
	$L_{eq(24)} \leq 45$ dB	Other indoor areas with human activities such as schools, etc.

Notes:
dB = decibels; EPA = U.S. Environmental Protection Agency; L_{dn} = day-night noise level (L_{eq} with a 10-dB nighttime weighting); $L_{eq(24)}$ = equivalent noise level (the sound energy averaged over a 24-hour period)
Source: U.S. Environmental Protection Agency, 1974 (March). *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* Washington, DC. Page 3.

EPA administrators determined in 1981 that subjective issues such as noise would be better addressed at lower levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to state and local governments. However, noise control guidelines and regulations contained in the rulings by EPA in prior years are still upheld by designated federal agencies, allowing more individualized control for specific issues by designated federal, state, and local government agencies.

To address the human response to groundborne vibration, FTA has guidelines for maximum-acceptable vibration criteria for different types of land uses. Maximum-acceptable vibration criteria based on the frequency of an event are applied to different types of land uses to address the human response to groundborne vibration.[24] These guidelines recommend 65 VdB, referenced to 1 μin/sec and based on the velocity amplitude for land uses where low ambient vibration is essential for interior operations (e.g., hospitals, high-tech manufacturing, laboratory facilities); 80 VdB for residential uses and buildings where people normally sleep; and 83 VdB for institutional land uses with primarily daytime operations (e.g., schools, churches, clinics, offices).[25] Table 4.6-17, "Summary

[23] U.S. Environmental Protection Agency. 1974 (March). *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* Washington, DC. Page 3.
[24] Federal Transit Administration. 2006 (May). *Transit Noise and Vibration Impact Assessment.* Washington, DC. Page 8-3.
[25] Ibid.

Table 4.6-17
Summary of FTA-Recommended Groundborne Vibration Impact Criteria

Land Use Category	Impact Levels (VdB; relative to 1 microinch per second)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where vibration would interfere with interior operations	65[4]	65[4]	65[4]
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime uses	75	78	83

Notes: FTA = Federal Transit Administration; VdB = vibration decibels
[1] Defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.
[2] Defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.
[3] Defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.
[4] 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. Ensuring lower vibration levels in a building often requires special design of the heating, ventilation, and air conditioning systems and stiffened floors.
Source: Federal Transit Administration. 2006 (May). *Transit Noise and Vibration Impact Assessment.* Washington, DC. Page 8-3.

of FTA-Recommended Groundborne Vibration Impact Criteria," shows the allowable project contribution noise level increases determined to be acceptable.

Standards have also been established to address the potential for construction-caused vibration annoyance or interference. The primary concern related to construction vibration is the potential to cause structural damage to buildings by the operation of heavy-duty construction equipment. Varying criteria have been developed to address the appropriate level of vibration considered acceptable before it may result in damage to structures or varying building types.[26] Table 4.6-18, "Summary of FTA-Recommended Vibration Damage Criteria," shows the allowable project contribution vibration level thresholds determined to be acceptable for different building types.

Table 4.6-18
Summary of FTA-Recommended Vibration Damage Criteria

Building Category	PPV (in/sec)	Approximate L_v[1]
Reinforced concrete, steel, or timber (no plaster)	0.5	102
Engineered concrete and masonry (no plaster)	0.3	98
Nonengineered timber and masonry buildings	0.2	94
Buildings extremely susceptible to vibration damage	0.12	90

Notes:
FTA = Federal Transit Administration; in/sec = inches per second; PPV = peak particle velocity
[1] Root mean square velocity in decibels (VdB) referenced to 1 microinch per second.
Source: Federal Transit Administration. 2006 (May). *Transit Noise and Vibration Impact Assessment.* Washington, DC. Page 12-13.

[26] Federal Transit Administration. 2006 (May). *Transit Noise and Vibration Impact Assessment.* Washington, DC. Page 12-13.

STATE

The *State of California General Plan Guidelines*, published by the Governor's Office of Planning and Research, provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours.[27] Generally, residential uses are considered normally acceptable in areas where exterior noise levels do not exceed 60 dB CNEL/L_{dn}. Hospitals are normally acceptable in areas up to 70 dB CNEL/L_{dn} and normally unacceptable in areas exceeding 70 dB CNEL/L_{dn}. Normally acceptable noise levels are those in which no special noise reduction techniques are required to achieve satisfactory living conditions. The guidelines also present flexibility and adjustment factors that may be used to arrive at noise-acceptability standards reflecting the particular community's noise-control goals, sensitivity to noise, and assessment of the relative importance of noise issues. As described further in the "City/Local" section on page 4.6-34, the City has adopted and changed its land use compatibility guidelines for use within San Francisco.

The State of California has adopted noise standards in areas of regulation not preempted by the federal government. State standards regulate noise levels of motor vehicles, sound transmission through buildings, and occupational noise, as well as noise insulation.

Title 24, Part 6, Division T25, Chapter 1, Subchapter 1, Article 4, Sections T25–28 of the California Code of Regulations establish building standards applicable to all dwellings throughout the state. The code provides acoustical regulations requiring both exterior-to-interior sound insulation and sound and impact isolation between adjacent spaces of various occupied units. Title 24 regulations state that interior noise levels generated by exterior noise sources shall not exceed 45 dB L_{dn}, with windows closed, in any habitable room for general residential uses. An acoustical study must be conducted for new multifamily and hotel/motel buildings located in 60-dB L_{dn} contours to determine whether interior noise levels would exceed 45 dB L_{dn}. The study must also demonstrate how the proposed project has been designed to meet this interior noise level standard. Generally, the inclusion of noise-insulating windows and sound isolation materials in the project design are means of demonstrating compliance with this interior noise level standard.

For the protection of buildings from groundborne vibration, Caltrans recommends a limit of 0.5 in/sec PPV for new residential buildings and 0.25 in/sec PPV for older or historically significant buildings.[28] To avoid human annoyance, Caltrans recommends that vibration levels at sensitive land uses be limited to 0.04 in/sec PPV for transient vibration and 0.01 in/sec PPV for continuous vibration.[29]

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[27] Governor's Office of Planning and Research. 2003 (October). *State of California General Plan Guidelines*. Sacramento, CA. Page 250.

[28] California Department of Transportation. 2004. *Transportation and Construction-Induced Vibration Guidance Manual*. Sacramento, CA. Table 19. Page 27.

[29] Ibid.

CITY/LOCAL

San Francisco General Plan

The General Plan focuses on the effect that noise from ground-transportation noise sources has on the community and includes a land use compatibility chart for community noise. This chart, presented in Table 4.6-19, “City and County of San Francisco Land Use Compatibility Chart for Community Noise” (page 4.6-38), identifies a range of noise levels considered generally compatible or incompatible with various land uses and indicates when special noise reduction requirements should be considered or analyzed, such as providing sound insulation for affected properties. Residential and hotel uses are considered compatible in areas where the noise level is 60 dBA L_{dn} or less; schools, classrooms, libraries, churches, and hospitals are compatible in areas where the noise level is 65 dBA L_{dn} or less; and playgrounds, parks, offices, retail commercial uses, and noise-sensitive manufacturing and communication uses are considered compatible in areas where the noise level is 70 dBA L_{dn} or less.

San Francisco Noise Control Ordinance

The San Francisco Noise Control Ordinance regulates both construction noise and stationary-source noise within the city, such as transportation, construction, mechanical equipment, entertainment, and human or animal behavior. Found in Article 29, “Regulation of Noise,” of the San Francisco Police Code, the ordinance addresses noise from construction equipment, nighttime construction work, and noise from stationary mechanical equipment and waste processing activities. The following is the purpose of the Noise Ordinance:

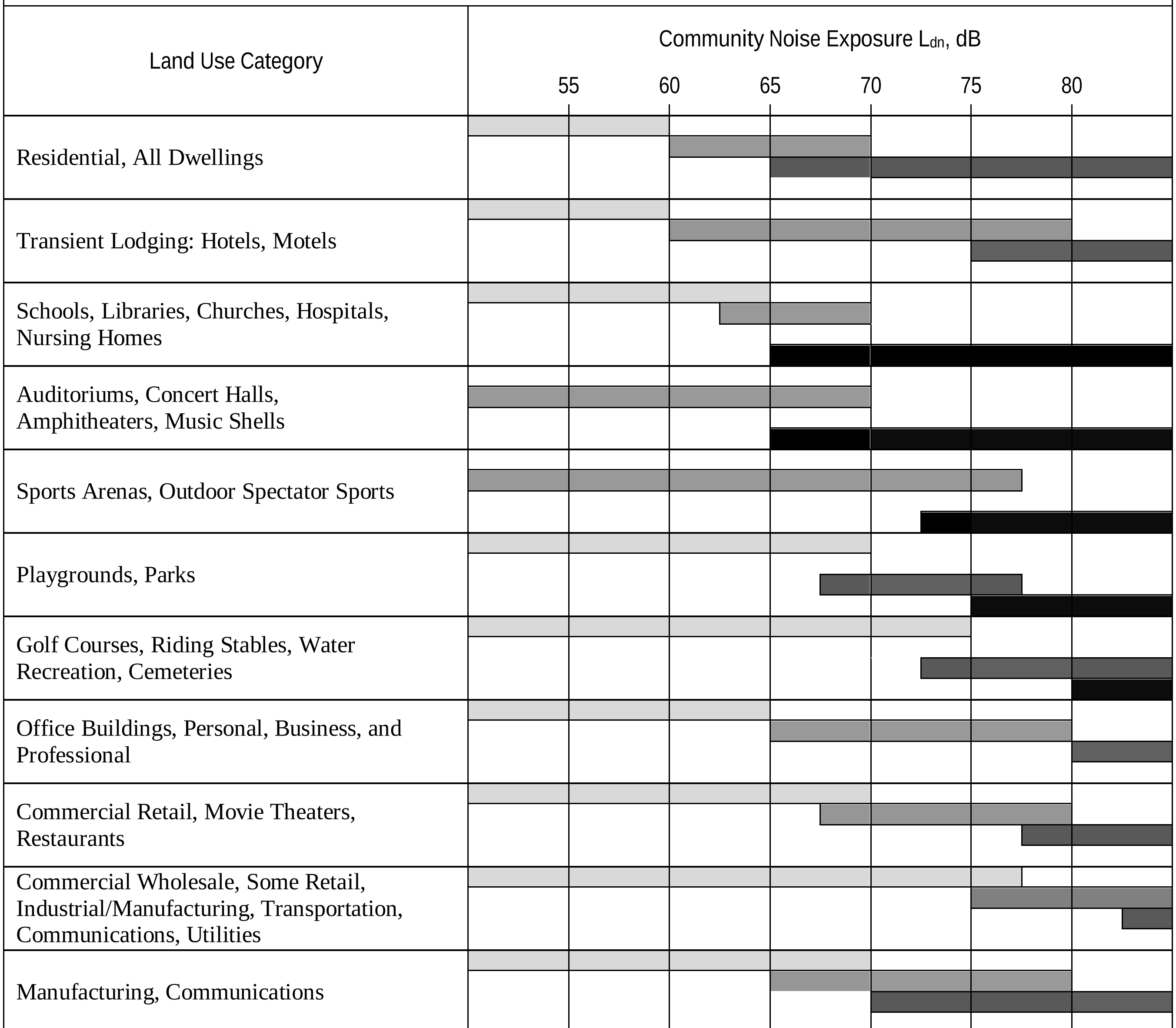
Sec. 2900, “Declaration of Policy”

(a) Building on decades of scientific research, the World Health Organization and the U.S. Environmental Protection Agency have determined that persistent exposure to elevated levels of community noise is responsible for public health problems including, but not limited to: compromised speech, persistent annoyance, sleep disturbance, physiological and psychological stress, heart disease, high blood pressure, colitis, ulcers, depression, and feelings of helplessness.

(b) The General Plan for San Francisco identifies noise as a serious environmental pollutant that must be managed and mitigated through the planning and development process. But given our dense urban environment, San Francisco has a significant challenge in protecting public health from the adverse effects of community noise arising from diverse sources such as transportation, construction, mechanical equipment, entertainment, and human and animal behavior.

(c) In order to protect public health, it is hereby declared to be the policy of San Francisco to prohibit unwanted, excessive, and avoidable noise. It shall be the policy of San Francisco to maintain noise levels in areas with existing healthful and acceptable levels of noise and to reduce noise levels, through all practicable means, in

Table 4.6-19
City and County of San Francisco Land Use Compatibility Chart for Community Noise



Satisfactory, with no special noise insulation requirements.

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.

New construction or development should generally not be undertaken.

Notes: dB = decibels; L_{dn} = day-night noise level
Source: San Francisco Planning Department. 1996. *San Francisco General Plan*. As amended by Resolution No. 14149, adopted June 27, 1996. San Francisco, CA. Environmental Protection Element, Policy 11.1.

those areas of San Francisco where noise levels are above acceptable levels as defined by the World Health Organization's Guidelines on Community Noise.

(d) It shall be the goal of the noise task force described in this Article to determine if there are additional adverse and avoidable noise sources not covered in this statute that warrant regulation and to report to the Board of Supervisors and recommend amendments to this Article over the next three years. In addition, the noise task force shall develop interdepartmental mechanisms for the efficient disposition and any enforcement required in response to noise complaints.

(Added by Ord. 274-72, App. 9/20/72; Ord. 278-08, File No. 081119, App. 11/25/2008)

Sections 2904, 2907, 2908, 2909, and 2910 of the ordinance are all applicable to the proposed CPMC LRDP and are described below.

Section 2904, "Waste Disposal Services"

This section of the San Francisco Noise Control Ordinance limits the noise level produced by waste disposal activities on garbage trucks to 75 dB when measured at a distance of 50 feet from the equipment. The maximum noise level does not apply to the noise associated with crushing, compacting, dropping, or moving garbage on the truck, but only to the truck's mechanical processing system.

Section 2907, "Construction Equipment," and Section 2908, "Construction Work at Night"

These sections of the ordinance establish noise levels for construction equipment. Section 2907(a) limits noise levels from construction equipment as specified under the ordinance to 80 dB L_{eq} at 100 feet (or other equivalent distances) from construction equipment between 7 a.m. and 8 p.m. According to Section 2908, construction work at night (from 8 p.m. to 7 a.m.) may not exceed the ambient level by 5 dB at the nearest property plane unless a special permit is granted before such work by the Director of Public Works or the Director of Building Inspection. The provisions of Section 2907(a) do not apply to impact tools and equipment if the impact tools and equipment have intake and exhaust mufflers as recommended by the manufacturers and are approved by the Director of Public Works or the Director of Building Inspection as accomplishing maximum noise attenuation. The noise exemption also does not apply to pavement breakers and jackhammers, which also must be equipped with acoustically attenuating shields or shrouds as recommended by the manufacturers and approved by the Director of Public Works or the Director of Building Inspection as accomplishing maximum noise attenuation.

Section 2909, "Noise Limits"

This section of the ordinance regulates noise from mechanical equipment. (As defined by the ordinance: "No person shall produce or allow to be produced by any machine or device, music or entertainment, or any combination of same.") This would include all equipment—e.g., electrical equipment (transformers, emergency generators) as well as mechanical equipment—that is installed on commercial/industrial and residential properties. Mechanical equipment operating on commercial or industrial property must not produce a noise level more than 8 dB above the ambient noise level at the property plane. Equipment operating on residential property must not produce a noise level more than 5 dB above the ambient noise level at the property boundary.

Section 2909 also states that no fixed (permanent) noise source (as defined by the ordinance) may cause the noise level inside any sleeping or living room in a dwelling unit on residential property to exceed 45 dB between 10 p.m. and 7 a.m. or 55 dB between 7 a.m. and 10 p.m. when windows are open, except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

Section 2910, "Variances"

This section of the ordinance empowers the Directors of Public Health, Public Works, and Building Inspection and the Entertainment Commission, and the Chief of Police to grant variances to noise regulations, over which they have jurisdiction pursuant to Section 2916. All administrative decisions granting or denying variances may be appealed to the San Francisco Board of Appeals.

Degradation of the Ambient Community Noise Environment

Another consideration in defining impact criteria is based on the degradation of the existing ambient noise environment. In community noise assessments, the impact is "generally not significant" if no noise-sensitive sites are located within the project vicinity, or if increases in community noise levels associated with project implementation would not exceed 3 dB at noise-sensitive locations in the project vicinity.[30]

A limitation in using a single value to evaluate an impact related to a noise-level increase would be the failure to account for the existing ambient noise environment to which a person has become accustomed. Studies assessing the percentage of people highly annoyed by changes in ambient noise levels indicate that when ambient noise levels are low, a greater change is needed to cause a response. As ambient noise levels increase, a lesser change in noise levels is required to elicit substantial annoyance. The significance criteria listed in Table 4.6-20, "Significant Change in Ambient Noise Levels," are considered to correlate well with human response to changes in ambient noise levels and assess degradation of the ambient community noise environment.

[30] California Department of Transportation. 2009 (November). *Technical Noise Supplement.* Division of Environmental Analysis. Sacramento, CA. Prepared by ICF Jones & Stokes, Sacramento, CA. Page 2-48.

Table 4.6-20
Significant Change in Ambient Noise Levels

Existing Ambient Noise Level, L_{dn}/CNEL	Significant Increase
< 60 dB	5 dB or greater
> 60 dB	3 dB or greater

Note: CNEL = community noise equivalent level; dB = decibels; L_{dn} = day-night average noise level
Sources: Adapted by AECOM in 2009 from Federal Interagency Committee on Noise. 1992 (August). *Federal Agency Review of Selected Airport Noise Analysis Issues*. Washington, DC. Page 3-5.

4.6.3 CUMULATIVE CONDITIONS

Cumulative noise conditions in San Francisco are likely to increase over the next 10–20 years. Traffic noise from passenger, commercial, and transit vehicles would continue to be the primary noise sources. Traffic volumes and associated noise would be directly related to population and employment changes in the vicinity of CPMC campuses. Stationary noise sources from commercial areas, waste removal, and construction and maintenance activities would also contribute to the cumulative noise environment. The exact amount of noise increase is difficult to predict, but would be based on population density, the economic viability of the areas surrounding the CPMC campuses, technological advances, and land use planning decisions.

4.6.4 SIGNIFICANCE CRITERIA

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been adopted and modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the project would result in a significant impact on noise. Implementation of the proposed project would have a significant effect on noise if it would:

- 6a—result in exposure of persons to or generation of noise levels in excess of standards established in the *San Francisco General Plan* or San Francisco Noise Control Ordinance, or applicable standards of other agencies;
- 6b—result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- 6c—result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- 6d—result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;

- 6e—expose people residing or working in the area to excessive noise levels, for a project located within an airport land use plan area, or, where such a plan has not been adopted, in an area within 2 miles of a public airport or public use airport;

- 6f—expose people residing or working in the project area to excessive noise levels, for a project located in the vicinity of a private airstrip; or

- 6g—be substantially affected by existing noise levels.

Based on the criteria outlined above, a short-term construction noise impact would occur if noise generated by construction were to violate Sections 2907 and 2908 of the San Francisco Noise Control Ordinance. For long-term operational noise, a project may have a significant impact on the environment if it would substantially increase the ambient noise levels for adjoining areas or expose people to severe noise levels. In practice, more specific professional standards have been implemented. These standards state that a noise impact may be considered significant if it would generate noise that would conflict with local planning criteria or ordinances, or substantially increase noise levels at noise-sensitive land uses.

For the proposed CPMC LRDP, the criteria for anticipated noise effects are based on a comparison between predicted noise levels and noise criteria defined by the City. Noise impacts are considered significant if:

- existing or proposed noise-sensitive land uses would be exposed to noise levels exceeding the noise standards and land use compatibility guidelines in the General Plan or the standards in the San Francisco Noise Control Ordinance, described above (see Section 4.6.2, "Regulatory Framework," page 4.6-30); or

- implementing the project would result in an increase in ambient noise levels exceeding those listed in Table 4.6-20, "Significant Change in Ambient Noise Levels" (4.6-38).

4.6.5 Impact Evaluations

Methodology for Assessing Noise Impacts

Data included in Chapter 2, "Project Description," and obtained during on-site noise monitoring were used to determine the potential locations of noise-sensitive receptors and noise-generating land uses on the various CPMC campus sites. Noise-sensitive land uses and major noise sources near the sites were identified based on existing documentation (e.g., equipment noise levels and attenuation rates) and site reconnaissance data.

Baseline ambient noise levels to which project-generated noise was compared were generated from a combination of sources:

- the existing-noise surveys conducted for this project,
- data from previous noise measurements,
- predictions from traffic noise modeling,
- stationary-source noise levels based on manufacturers' specifications, and
- noise surveys for other types of stationary noise sources.

To assess the potential short-term noise impacts from construction, sensitive receptors and their relative levels of exposure were identified. Construction noise generated by the proposed near-term and long-term projects was predicted using the *Transit Noise and Vibration Impact Assessment* methodology for construction noise prediction.[31] The noise emission levels referenced and usage factors are based on FHWA's Roadway Construction Noise Model.[32] Noise levels of specific construction equipment and resultant noise levels at the locations of sensitive receptors were calculated.

The FHWA Traffic Noise Prediction Model (FHWA RD 77-108) was used to model traffic noise levels along affected roadways, based on daily volumes and their distribution, from the traffic analysis prepared for the full buildout of CPMC LRDP near-term and long-term projects in 2015 and 2030, respectively. The contribution of the projects to traffic noise levels along area roadways was determined by comparing the modeled noise levels at 50 feet from the centerline of the roadway under no-project and plus-project conditions. The land use compatibility of the CPMC LRDP with noise levels from 2030 traffic sources was determined by comparing modeled noise levels at proposed noise-sensitive receptors.

Potential long-term (operational) noise impacts from stationary sources (HVAC, loading docks) were assessed based on existing documentation (equipment noise levels) and site reconnaissance data. This analysis also evaluates the proposed noise-generating uses that could affect noise-sensitive receptors near the CPMC campuses.

Land use compatibility between conflicting land uses was determined based on the proposed land uses, adjacent parcels, and existing zoning.

Groundborne-vibration impacts were quantitatively assessed based on existing documentation (e.g., vibration levels produced by specific construction equipment operations) and the distance of sensitive receptors from the given source. Near-term and long-term vibration sources and levels were calculated using the FTA methodology for construction and transportation vibration sources.[33]

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[31] Federal Transit Administration. 2006 (May). *Transit Noise and Vibration Impact Assessment.* Washington, DC. Pages 5-1 through 5-29 and 10-1 through 10-12.

[32] Federal Highway Administration. 2006 (January). *Roadway Construction Noise Model Version 1.0* (FHWA RCNM V. 1.0). Washington, DC. Page 3.

[33] Federal Transit Administration. 2006 (May). *Transit Noise and Vibration Impact Assessment.* Washington, DC. Page 12-11.

IMPACTS NOT ADDRESSED FURTHER

The existing and proposed CPMC campuses are not located within an airport land use plan, within 2 miles of any nearby airports that have not adopted a land use plan, or in the vicinity of any private airstrips. Implementing the CPMC LRDP would not expose any noise-sensitive receptors to excessive aircraft noise. Thus, the impacts of aircraft noise (Significance Criteria 6e and 6f) are not addressed further in this EIR.

IMPACT NO-1

Short-term noise generated by project-related construction and/or demolition activities could temporarily expose existing nearby noise-sensitive receptors to substantial increases in ambient noise levels. (Significance Criteria 6a and 6d)

Levels of significance:

- *Cathedral Hill (with or without project variants): Less than significant with mitigation*
- *Pacific: Less than significant with mitigation*
- *Davies (near term and long term): Less than significant with mitigation*
- *St. Luke's (with or without either project variant): Less than significant with mitigation*

Construction activities for development projects under the CPMC LRDP would include site preparation (e.g., demolition, excavation, grading, and clearing), basement excavation, trenching, pouring of concrete foundations, paving, erection of steel structures and exterior enclosures, interior buildout, equipment installation, finishing, and cleanup. No pile driving or rock blasting is anticipated to occur. Construction phasing is outlined below by individual campus. No exterior construction would occur at the California Campus under the LRDP; therefore, no construction-noise impact would occur.

The construction equipment anticipated to be used for on-site demolition and construction projects on CPMC campuses is shown in Table 4.6-21, "Noise Levels of Typical Construction Equipment." The noise levels of primary concern are typically associated with the site preparation and excavation phases because the equipment used for breaking up the structure, clearing, grading, excavating, and removing material from the site typically generates the highest noise levels (approximately 85 dB at 50 feet) and its operation is exposed in the open air. Project-related noise levels at noise-sensitive land uses close to the development sites on various campuses would be lower during other phases of project construction (exterior enclosure, interior buildout, finishing).

To comply with the San Francisco Noise Control Ordinance, noise from construction activities occurring between 7 a.m. and 8 p.m. must not exceed 80 dB at 100 feet. In addition, work conducted between 8 p.m. and 7 a.m. must

Table 4.6-21
Noise Levels of Typical Construction Equipment

Equipment Type	Typical Noise Level (dB) @ 50 feet	Usage Factor (%)
Air compressor	80	40
Backhoe	80	40
Concrete pump truck	82	20
Crane, mobile	85	16
Dozer	85	40
Drill rig truck	84	20
Excavator	85	40
Front-end loader	80	40
Generator	82	50
Jackhammer	85	20
Lift	85	20
Mounted impact hammer (hoe ram)	90	20
Pneumatic tools	85	50
Pumps	77	50
Roller	85	20
Soil mix drill rig	80	50
Welder	73	40
Trucks	74–81	

Notes:
dB = (A-weighted) decibels; Usage factor = the percent per hour equipment is in use.
All equipment is fitted with a properly maintained and operational noise control device, per manufacturer specifications. Noise levels listed are manufacturer-specified noise levels for each piece of heavy construction equipment.
Source: Federal Transit Administration. 2006 (May). *Transit Noise and Vibration Impact Assessment.* Washington, DC. Pages 12-6 and 12-7.

not exceed the ambient noise levels at the site's property line by 5 dBA, unless a special permit is granted before such work by the Director of Public Works or the Director of Building Inspection.

As described for each campus below, project construction would also result in short-term increases in traffic volumes on the local roadway networks. Increased construction traffic would include trips by worker vehicles, worker shuttles, construction equipment, and material delivery vehicles, as well as demolition and excavation hauling trips to and from the site. Trips by workers to and from the campuses would be nominal when added to existing traffic volumes and thus do not require further discussion. During the noise-sensitive nighttime hours, trips associated with demolition and construction activities would increase existing ambient noise levels because engine noise would be generated during ingress and egress, idling, and revving during materials offloading.

Near-Term Projects

◆ Cathedral Hill Campus

Cathedral Hill Hospital and Cathedral Hill MOB

Construction of the proposed Cathedral Hill Hospital is expected to begin in early 2011 and would continue for approximately 4½ years. The approximate duration of key construction phases is expected to be as follows, with some overlap occurring between certain phases:

- demolition of the existing Cathedral Hill Hotel, Cathedral Hill MOB, and 1255 Post Street Office Building, 6–9 months;
- excavation, 5–6 months;
- foundation work, 3–6 months;
- structure work, 16–18 months;
- exterior finishing, 9–14 months; and
- interior work, 11–29 months.

Only interior tenant improvements are proposed for the 1375 Sutter MOB at the proposed Cathedral Hill Campus as existing tenants move out and new medical office–related tenants move in. Interior finish work at this building is not expected to generate exterior noise levels exceeding the existing ambient noise levels at nearby sensitive receptors.

The proposed Cathedral Hill Hospital is expected to be occupied and in operation by early 2015. As stated above, the loudest construction noise would result from demolition, excavation, and land preparation. These activities would require the use of heavy trucks, excavators, loaders, dozers, roller, cranes, lifts, compressors, pumps, hand tools (e.g., jackhammers, drills), and other mobile and stationary equipment. Excavation and hauling of 121,295 cubic yards of soil would be required for the hospital site and 92,000 cubic yards for the MOB site. Thus, the loudest construction noise at the Cathedral Hill Campus would occur in the first 11–15 months of construction. The remaining activities (structural work, exterior finishing, and interior finishing) over the remaining 34 months would have lower noise levels because activities would be shielded by the structure and limited use of heavy-duty construction equipment would occur. The remaining activities would require primarily compressors, generators, lifts, welders, sprayers, and hand tools. Hours of operation during construction phases would extend from 7 a.m. to midnight on all typical work days, using two shifts. Saturday work would occur from 7 a.m. to 5 p.m.; work is not expected to be done on Sunday. The hours of operation would vary slightly during the development projects' various stages.

Noise levels for the demolition and excavation phases were calculated with FHWA's Roadway Construction Noise Model, using typical amounts of construction equipment for demolition and excavation activities. During the most intense phases, construction noise generated at the proposed Cathedral Hill Campus would be 81 dB L_{eq} at 100 feet and, therefore, 1 dB above the daytime standard in the San Francisco Noise Ordinance. Receptors closer to the campus than 100 feet away would experience equivalent or higher noise during daytime construction. Project construction noise levels at the nearest sensitive receptors to the Cathedral Hill Campus are shown in Table 4.6-22, "Exposure of Sensitive Receptors near the Proposed Cathedral Hill Campus to Demolition/Excavation/Construction Noise."

Table 4.6-22
Exposure of Sensitive Receptors near the Proposed Cathedral Hill Campus to Demolition/Excavation/Construction Noise

Sensitive Receptor	Existing Noise Level (dB, L_{eq})	Distance (feet)	Modeled Construction Noise Level (dB, L_{eq})	Exceeds Ambient (dB)
Geary Boulevard residences (across from hospital site)	70	**90**	**81**	+11
Hamilton Square Baptist Church	70	**80**	**82**	+12
1 Daniel Burnham Court (residential/mixed use)	68	**100**	**81**	+13
1142 Van Ness Avenue (Concordia Argonaut)	70	**50**	**87**	+17
1001 Polk Street (Episcopal Community Services- residential)	66	**75**	**83**	+17
990 Geary Avenue (Rex Arms Apartments)	70	150	77	+7
990 Polk Street (Senior Apartments)	65	190	75	+10
The Opal San Francisco Hotel—1050 Van Ness Avenue	70	**90**	**81**	+11
Super 8 Hotel—1015 Geary Street	70	**90**	**81**	+11
First Unitarian Church—1187 Franklin Street	72	180	75	+3

Note: dB = (A-weighted) decibels; L_{eq} = equivalent noise level (hourly)
Boldface indicates noise level in excess of 80 dB at 100 feet or less from the noise source.
Source: Data calculated by AECOM in 2010

As shown in Table 4.6-22, ambient noise levels at noise-sensitive receptors near the proposed Cathedral Hill Campus would increase by between 3 dB and 17 dB as a result of LRDP-related construction. The maximum noise level generated by project construction activities at the exterior of these land uses could be up to 87 dB. During demolition, excavation, and foundation construction, it is expected that the construction noise would be shielded partially or completely by a portion of the shell of existing building façades being demolished (Cathedral Hill Hotel and 1255 Post Street, and the seven smaller existing buildings between Geary and Cedar Streets across Van Ness Avenue), and the eventual construction pit as work progresses. However, this shielding effect has not been accounted for in the reported noise levels.

Most of the construction activities at the proposed Cathedral Hill Campus would occur between 7 a.m. and 8 p.m. Demolition of the existing buildings and site excavation for the Cathedral Hill Hospital would generally occur between 7 a.m. and 4 p.m., Monday–Friday. At both the Cathedral Hill Hospital site and the Cathedral Hill MOB site, construction on Saturdays is proposed for generally between 7 a.m. and 5 p.m. No construction is planned on Sundays. However, CPMC also proposes a second construction shift during the demolition and excavation phase at the hospital and MOB sites to aid in off-site disposal of the demolished material and allow excavated material to be hauled off during lighter traffic periods. The second shift would be from 4 p.m. to midnight, Monday–Friday.[34] Extended work hours (until midnight on weekdays) are also proposed for the foundation and structural stages, during concrete placement and finishing activities and the pouring of concrete decks. Welding activities on the structural steel tower could also extend into a second shift, depending on the availability of certified welders.

In summary, noise generated by construction demolition and excavation activities at the site of the proposed Cathedral Hill Campus would exceed 80 dB at 100 feet from the source at seven sensitive-receptor locations (Geary Boulevard residences, Hamilton Square Baptist Church, 1 Daniel Burnham Court, 1142 Van Ness Avenue, 1001 Polk Street, 1050 Van Ness Avenue, and 1015 Geary Street). Therefore, proposed construction would create noise that would be out of compliance with the noise levels for daytime construction (7 a.m. to 8 p.m.) established by the San Francisco Noise Control Ordinance. Construction-related traffic would not expose noise-sensitive receptors to a substantial increase in traffic noise levels. Also, the second shift of construction at the Cathedral Hill Hospital and Cathedral Hill MOB sites, and construction of the Van Ness Avenue pedestrian tunnel, conducted between 8 p.m. and midnight, would exceed the ambient noise levels by 5 dBA, as measured at the property line. This nighttime construction would occur during the initial 11–15 months of the demolition/construction phase; and as noted above, a special permit would be required to allow construction work after 8 p.m. or before 7 a.m. As a result, construction activities at the Cathedral Hill Campus would not comply with the standards of the San Francisco Noise Control Ordinance. Therefore, **this impact from construction of the Cathedral Hill Hospital and Cathedral Hill MOB would be potentially significant**.

Van Ness Avenue Pedestrian Tunnel

Construction of the Van Ness Avenue pedestrian tunnel would occur concurrently with construction of the proposed Cathedral Hill Hospital and Cathedral Hill MOB. A “cut-and-cover” construction method is proposed to avoid the need for extended lane closures during high-traffic periods and to minimize disruption of traffic.[35] This construction operation would require the closure of two traffic lanes at a time along Van Ness Avenue during each work shift during the surface work phase, which would occur between 7 p.m. and 5 a.m., Monday–Friday, and

[34] Herrero Boldt. 2009 (December). CPMC Cathedral Hill Hospital and Medical Office Building Construction Data. San Francisco, CA. These data are on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and are available for public review as part of the project file, in Case No. 2005.0555E.

[35] A detailed description of the “cut-and-cover” construction method is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and are available for public review as part of the project file, in Case No. 2005.0555E.

would require approximately 4 months to complete. Additional construction activities that would occur between 8 p.m. and 7 a.m. include hauling demolished building material and excavated soil material from the hospital site and excavating within the Van Ness Avenue right-of-way for construction of the tunnel. Construction of the tunnel foundation and structure, as well as construction of the tunnel interior, would be performed between 7 a.m. and 5 p.m., Monday–Friday. Noise generated by tunnel foundation and finish work between 7 a.m. and 8 p.m. would be enclosed within the tunnel; therefore, this noise would be less than 80 dB at 100 feet, and therefore would not exceed the San Francisco Noise Control Ordinance's standard for construction. **This impact from construction of the Van Ness Avenue pedestrian tunnel would be less than significant.**

Cathedral Hill Campus with No Van Ness Avenue Pedestrian Tunnel Variant: Excluding construction of the Van Ness Avenue pedestrian tunnel from near-term projects at the proposed campus would reduce the intensity and duration of construction activity at the site, particularly during the more noise-sensitive nighttime hours, by removing the nighttime excavation and material transport hauling required for tunnel construction. However, tunnel construction would be only a small part of the overall proposal for a Cathedral Hill Campus, and it would occur concurrently with other construction components that are major noise sources associated with hospital and MOB construction. Thus, the noise reduction achieved by not constructing the tunnel would not reduce LRDP construction-generated noise levels around the Cathedral Hill Campus sufficiently to avoid a substantial increase in nighttime noise levels at nearby noise-sensitive receptors. The overall effect of project-generated construction noise would not change with elimination of the Van Ness Avenue pedestrian tunnel under the variant. As a result, this impact would be similar to, but slightly less than, the impact of the projects described above. For the same reasons as discussed above, **this impact would be potentially significant**.

Cathedral Hill Campus with Two-Way Post Street or MOB Access Variant: Implementing the Two-Way Post Street or MOB Access Variant would not substantially contribute to the overall effect of project-generated construction noise. No major construction components are necessary for reconfiguring the flow of traffic. However, with this variant, the noise impact related to the construction of the proposed Cathedral Hill Hospital and Cathedral Hill MOB would remain unchanged. For the same reasons as discussed above, **this impact would be potentially significant**.

Mitigation Measure for Cathedral Hill Campus (with or without project variants)

M-NO-N1a CPMC shall minimize the impacts of construction noise where feasible by implementing the measures listed below in accordance with the San Francisco Noise Control Ordinance. These measures shall be required in each contract agreed to between CPMC and a contractor under the LRDP and shall be applied to all projects and programs covered by this EIR.

- Construction equipment shall be properly maintained in accordance with manufacturers' specifications and shall be fitted with the best available noise suppression devices (e.g., mufflers, silencers, wraps).

All impact tools shall be shrouded or shielded, and all intake and exhaust ports on power equipment shall be muffled or shielded.

- Construction equipment shall not idle for extended periods of time near noise-sensitive receptors.

- Stationary equipment (compressors, generators, and cement mixers) shall be located as far from sensitive receptors as feasible. Sound enclosures shall be used during noisy operations on-site.

- Temporary barriers (noise blankets or wood paneling) shall be placed around the construction site parcels and, to the extent feasible, they should break the line of sight from noise sensitive receptors to construction activities. For temporary sound blankets, the material shall be weather and abuse resistant, and shall exhibit superior hanging and tear strength with a surface weight of at least 1 pound per square foot. Placement, orientation, size, and density of acoustical barriers shall be reviewed and approved by a qualified acoustical consultant.

- When temporary barrier units are joined together, the mating surfaces shall be flush with each other. Gaps between barrier units, and between the bottom edge of the barrier panels and the ground, shall be closed with material that would completely close the gaps, and would be dense enough to attenuate noise.

M-NO-N1b A community liaison shall be designated by CPMC. The community liaison shall be available to manage and respond to noise complaints from nearby sensitive receptors. Contact information for the community liaison shall be posted in a conspicuous location so that it is clearly visible to the nearby receptors most likely to be disturbed. The community liaison shall be responsible for ensuring that reoccurring noise complaints are evaluated by a qualified acoustical consultant to determine appropriate noise control measures to meet applicable standards. The community liaison shall contact nearby noise-sensitive receptors and shall advise them of the construction schedule.

M-NO-N1c A construction noise management plan shall be prepared by a qualified acoustical consultant. The noise management plan shall include, but shall not be limited to, the following tasks:

- A detailed evaluation of nighttime construction at noise-sensitive receptors shall be prepared. The evaluation shall include calculations of construction noise levels based on detailed information regarding construction methods and duration. If it is determined that construction noise levels would exceed City noise ordinance standards, a qualified acoustical consultant shall review and approve additional mitigation measures to minimize prolonged sleep disturbance (e.g., using acoustical treatments to existing buildings, such as upgraded weatherstripping, or determining the feasibility of constructing a cantilevered overhang along temporary barriers around the construction area to reduce construction noise levels at elevated receptors).

- Long- and short-term noise measurements shall be conducted at ground level and elevated locations to represent the noise exposure of noise-sensitive receptors adjacent to the construction area. The measurements shall be conducted for at least 1 week during the onset of each major phase of construction. Measurements shall be conducted during both daytime and nighttime hours of construction, with observations and recordings to document combined noise sources and maximum noise levels of individual pieces of equipment.

- Additional noise mitigation measures shall be identified. These measures shall be provided if noise levels from construction activities are found to exceed City standards and result in complaints that are lodged with the community liaison. These measures may include erecting additional temporary noise barriers at either the source or the receptor; building large temporary enclosures to shield receptors from the continuous engine noise of delivery trucks during offloads (e.g., concrete pump trucks during foundation work); or lining temporary noise barriers with sound absorbing materials.

Mitigation Measure M-NO-N1 involves implementing both physical (e.g., noise shielding) and operational (e.g., construction complaints coordinator) impact reduction measures that are considered practical and feasible. Thus, the impact of project construction noise would be reduced by implementation of this mitigation measure. However, CPMC proposes to undertake construction work at the Cathedral Hill Campus outside the construction work hours exempted by the City (7 a.m. to 8 p.m.). Therefore, it is assumed that a special permit would need to be granted by the Director of Public Works or the Director of Building Inspection to permit construction work that is proposed to occur after 8 p.m. or before 7 a.m. because construction noise could exceed ambient noise level by more than 5 dB. Assuming that this permit would be granted and that the recommended noise reduction techniques are part of the project, **implementing Mitigation Measures M-NO-N1a, M-NO-N1b, and M-NO-N1c at the proposed Cathedral Hill Campus would reduce Impact NO-1 to a less-than-significant level**.

◆ Davies Campus

Construction of the Neuroscience Institute building is expected to begin in early 2011 and would continue for approximately 2 years. The approximate duration of primary construction phases would be as follows:

- demolition of the surface parking lot at the corner of Noe Street and Duboce Avenue, 3 months;
- excavation, 2 months;
- foundation work, 2 months;
- structure work, 6 months;
- exterior finishing, 3 months; and
- interior finishing, 1 year.

The foundation of the Neuroscience Institute building would be erected by pouring concrete, then installing concrete slab-on-grade. The elevated concrete slabs would be poured on the metal decking during installation of the structural steel. The structural steel would be erected using a mobile crane. Intermittent closure of the sidewalk and parking lane on the west side of Noe Street is anticipated for the duration of the project.

The proposed Neuroscience Institute building is anticipated to be completed and occupied by the end of 2012.[36] As stated above, the loudest construction noise would result from demolition, excavation, and land preparation. Thus, the loudest noise during construction of the Neuroscience Institute building would occur in the first 8 months. The remaining activities (structural work, exterior finishing, and interior finishing) would last for the remaining 14 months and would have lower noise levels, because activities for erection of the building would be shielded by the structure and the use of heavy-duty construction equipment would be limited. All construction work for the proposed Neuroscience Institute building is proposed to occur between 7 a.m. and 5 p.m., Monday–Friday, excluding holidays. Work may continue to 8 p.m. on typical work days and select Saturdays, as required. Saturday shifts would be from 7 a.m. to 5 p.m., if needed. Work is not expected to be done on Sundays. The hours of operation would vary slightly during the project's various stages.

Noise levels for the demolition of the parking lot, removal of trees, and excavation and hauling of 6,000 cubic yards of soil during the construction phases were calculated with FHWA's Roadway Construction Noise Model, using typical amounts of construction equipment for demolition and excavation activities. During the most intense phases, construction noise generated at the Davies Campus would be 80 dB L_{eq} at 100 feet. Project construction noise levels at the nearest sensitive receptors to the Davies Campus are shown in Table 4.6-23, "Exposure of Sensitive Receptors near the Davies Campus to Construction Noise."

Table 4.6-23
Exposure of Sensitive Receptors near the Davies Campus to Construction Noise

Sensitive Receptor	Existing Noise Level (dB)	Distance (feet)	Modeled Construction Noise Level (dB, L_{eq})	Exceeds Ambient (dB)
On-site sensitive receptors—Davies Hospital North Tower	60	**90**	**81**	+21
On-site sensitive receptors—Davies Hospital South Tower	60	125	79	+19
900 block of 14th Street residences	66	420	68	+2
000 block of Noe Street residences	60	120	79	+19
700 block of Duboce Avenue residences	62	345	70	+8

Notes: dB = (A-weighted) decibels; L_{eq} = equivalent noise level (hourly)
Boldface indicates noise level in excess of 80 dB at 100 feet or less from the noise source.
Source: Data calculated by AECOM in 2010

As shown in Table 4.6-23, ambient noise levels at noise-sensitive receptors near the Davies Campus would increase by 2–21 dB as a result of construction of the proposed Neuroscience Institute building. The maximum noise level generated by proposed construction activities at the exterior of these land uses could be up to 81 dB. During demolition, excavation, and foundation construction, it is expected that the modeled construction noise

[36] The Davies Hospital retrofitting is under the jurisdiction of the Office of Statewide Health Planning and Development. This state office has reviewed and issued permits for their construction.

would be shielded partially or completely by the existing Davies Hospital North and South Tower façades and by the eventual excavated pit walls as construction work progresses.

On-campus sensitive receptors would be hospital patients and staff occupying the South and North Towers. Noise from construction could reach approximately 79 dB and 81 dB, respectively, at the exterior walls. The existing hospital towers are assumed to have an exterior-to-interior noise level reduction of 30 dB from the building façades attributable to noise reductions from construction of the concrete façade.[37] Interior noise levels in the hospital resulting from construction noise may range from 49 dB to 51 dB in rooms adjacent to the Neuroscience Institute building's construction area. The hospital is equipped with fixed windows, and ambient interior-noise levels are expected to be above the predicted interior construction-noise levels because of daily hospital activities. However, although construction activities might exceed the noise levels recommended for hospitals, this would only occur during daytime hours.

In summary, noise generated by near-term construction activities at the Davies Campus would exceed the San Francisco Noise Control Ordinance's standard of 80 dB at or less than 100 feet at one on-campus sensitive receptor, the Davies Hospital North Tower. Construction would not take place during the noise-sensitive nighttime hours. Thus, construction of the Neuroscience Institute building would not comply with the San Francisco Noise Control Ordinance at one sensitive receptor. Also, during the daytime hours, on-campus noise-sensitive receptors (patients and staff occupying the Davies Hospital North and South Towers) could experience elevated interior noise levels, including noise levels exceeding those recommended for hospitals. Therefore, as a conservative conclusion, **this impact would be potentially significant**.

Mitigation Measure for Davies Campus (near term)

M-NO-N1 This mitigation measure is similar to Mitigation Measures M-NO-N1a, M-NO-N1b, and M-NO-N1c for the Cathedral Hill Campus but differs in that evaluation of interior construction-noise levels at on-site receptors by a qualified acoustical consultant shall be required if the number of complaints to the community liaison becomes excessive and warrants further action.

This mitigation measure involves implementing both physical (e.g., noise shielding) and operational (e.g., construction complaints coordinator) impact reduction measures that are considered practical and feasible. Thus, **implementing Mitigation Measure M-NO-N1 at the Davies Campus would reduce Impact NO-1 to a less-than-significant level in the near term**.

[37] Data calculated by AECOM, 2010.

◆ St. Luke's Campus

Construction of the proposed St. Luke's Replacement Hospital would begin in early 2011 and continue for approximately 3½ years. Construction of the MOB/Expansion Building would begin after the new hospital building is in operation and the existing St. Luke's Hospital tower is demolished, and would continue for approximately 3 years. The approximate duration of key construction phases is expected to be as follows, with some overlap occurring between certain phases:

- utilities realignment, 8 months;
- excavation, 3 months;
- foundation work, 8 months;
- structure and exterior work, 15 months;
- interior work, 8 months;
- demolition of the existing St. Luke's Hospital tower (beginning soon after the building is vacated in early 2014), 5 months;
- excavation for the MOB/Expansion Building, 5 months;
- foundation work, 9 months;
- structure and exterior work, 11 months; and
- interior work, 12 months.

Construction of the proposed St. Luke's Replacement Hospital would begin with realignment of utilities from San Jose Avenue west onto 27th Street, followed by site preparation, demolition of the Redwood Administration Building, and erection of the concrete foundation. After completion of the foundation, the below-grade perimeter concrete walls would be installed. The elevated concrete slabs would be poured floor by floor on the metal decking during installation of the structural steel. The structural steel would be installed using a mobile crane. Sidewalk areas would be closed and pedestrian access prohibited on portions of 27th Street and Cesar Chavez Street for the duration of construction. Sidewalk areas on Valencia Street would be closed during demolition of the existing St. Luke's Hospital tower and subsequent work on the site.

The proposed St. Luke's Replacement Hospital would be completed and occupied by 2015. As stated above, the loudest construction noise would occur during excavation, land preparation, and demolition. Demolition would include removal of trees and pavement at the existing parking lot. Excavation of a pit for the hospital foundation and lower floor would follow and include removal of 15,200 cubic yards of material. About 7,800 cubic yards of soils would be excavated and hauled away for the utilities. Thus, the loudest noise during construction of the St. Luke's Replacement Hospital would occur in the first 20 months. The next phases of activities (structural work, exterior finishing, and interior finishing) would occur for 32 months, and would have lower noise levels, because activities would be shielded by the structure and use of heavy-duty construction equipment would be limited. Demolition of the existing St. Luke's Hospital tower would occur during the last 5 months. All construction work for the proposed St. Luke's Replacement Hospital is proposed to occur between 7 a.m. and 5 p.m., Monday–Friday, excluding holidays. Work may continue to 8 p.m. on typical work days and select Saturdays, as required. Saturday shifts would be from 7 a.m. to 5 p.m., if needed. Work is not expected to be done on Sundays. The hours of operation would vary slightly during the project's various stages. Construction of the MOB/Expansion Building would begin after the St. Luke's Replacement Hospital construction is completed. Excavation for the MOB/Expansion Building would be much deeper than that for the St. Luke's Replacement Hospital, with removal of 42,000 cubic yards of soil.

Noise levels for the excavation and demolition construction phases were calculated with FHWA's Roadway Construction Noise Model, using typical amounts of construction equipment for excavation and demolition activities. During the most intense phases, construction noise generated at the St. Luke's Campus would be 80 dB L_{eq} at 100 feet. Project construction noise levels at the nearest sensitive receptors to the St. Luke's Campus are shown below in Table 4.6-24, "Exposure of Sensitive Receptors near the St. Luke's Campus to Construction Noise."

Table 4.6-24
Exposure of Sensitive Receptors near the St. Luke's Campus to Construction Noise

Sensitive Receptor	Existing Noise Level (dB)	Distance (feet)	Modeled Construction Noise Level (dB, L_{eq})	Exceeds Ambient (dB)
On-site sensitive receptors (patients, staff)	65	170	76	+11
1450–1600 blocks of Guerrero Street	70	**65**	**84**	+14
3400–3700 blocks of Cesar Chavez	70	175	76	+6
1600–1700 blocks of Duncan Street	62	380	69	+7
578–643 blocks of San Jose Avenue	62	**100**	**81**	+19
000–100 blocks of 27th Street	63	125	76	+11

Notes: dB = (A-weighted) decibels; L_{eq} = equivalent noise level (hourly)
Boldface indicates noise level in excess of 80 dB at 100 feet or less from the noise source.
Source: Data calculated by AECOM in 2010

As shown in Table 4.6-24, ambient noise levels at noise-sensitive receptors near the St. Luke's Campus would increase by between 6 dB and 19 dB as a result of project construction. The highest noise level generated by project construction activities at the exterior of these land uses could be up to 84 dB L_{eq}. During excavation, demolition, and foundation construction, it is expected that the construction noise of the St. Luke's Replacement Hospital would be shielded partially or completely by the existing St. Luke's Hospital tower and by the eventual excavated pit walls as construction work progresses. During construction of the St. Luke's Replacement Hospital, the on-campus sensitive receptors would be patients and hospital staff occupying the existing St. Luke's Hospital tower. Noise from construction could reach approximately 76 dB at the exterior walls. The existing hospital tower is assumed to have an exterior-to-interior noise level reduction of 30 dB from the building façades attributable to noise reductions from concrete façade construction.[38] Interior noise levels resulting from construction noise would be 46 dB in rooms adjacent to the St. Luke's Replacement Hospital's construction area. The hospital is equipped with fixed windows, and ambient interior-noise levels are expected to be above the predicted interior construction noise levels because of daily hospital activities. However, although construction activities might exceed the noise levels recommended for hospitals, this would only occur during daytime hours.

Demolition of the existing St. Luke's Hospital tower, located approximately 50 feet from the 1957 Building, in 2014 would result in a 20-dB increase in the interior of the latter. Interior noise levels of 55 dB would occur in rooms of the 1957 Building adjacent to the demolition site.

In summary, noise generated by construction activities at the St. Luke's Campus would exceed 80 dB at 100 feet or less at the locations of two sensitive receptors (residences on Guerrero Street and San Jose Avenue). No construction would take place during the noise-sensitive nighttime hours. Thus, near-term construction at this campus would not comply with the San Francisco Noise Control Ordinance. However, during the daytime hours, on-campus noise sensitive receptors (patients and staff occupying the existing St. Luke's Hospital tower) would experience elevated interior-noise levels. Noise levels would exceed those recommended for hospitals. Therefore, as a conservative conclusion, **this impact would be potentially significant**.

St. Luke's Campus with Project Variants: The project variants for the St. Luke's Campus would not change the intensity, duration, work hours, or location of project construction activities (except that using a more direct alignment for realigned utilities under Cesar Chavez Street Utility Line Alignment Variant would result in minor changes to the construction location on campus). Therefore, for the same reasons as described above, **this impact would be potentially significant**.

Mitigation Measure for St. Luke's Campus

M-NO-N1 This mitigation measure is identical to Mitigation Measures M-NO-N1a, M-NO-N1b, and M-NO-N1c for the Cathedral Hill Campus.

For the same reasons as described for near-term projects at the Davies Campus, **implementing Mitigation Measure M-NO-N1 at the St. Luke's Campus would reduce Impact NO-1 to a less-than-significant level**.

[38] Data compiled by AECOM, 2010.

Long-Term Projects

Construction activities for long-term projects would be similar to the activities for near-term projects, described above. The on-site construction equipment likely to be used is shown in Table 4.6-20, “Typical Construction Equipment Noise Levels” (page 4.6-38). The noise levels of primary concern are typically associated with the demolition and site preparation phases; noise levels at noise-sensitive land uses close to the Pacific and Davies Campuses would be lower during other phases of project construction such as exterior enclosure, interior buildout, and finishing. As stated above, noise from construction activities between the hours of 7 a.m. and 8 p.m. must not exceed 80 dB at 100 feet to comply with the San Francisco Noise Control Ordinance. Work conducted between 8 p.m. and 7 a.m. must not exceed the ambient noise levels at the property line of the site by 5 dBA, unless a special permit is granted before such work by the Director of Public Works or the Director of Building Inspection.

◆ Pacific Campus

The conversion/renovation of the existing 2333 Buchanan Street Hospital to become the Ambulatory Care Center (ACC) is expected to begin in 2015 and be complete by the end of 2016. Construction of the ACC Addition and North-of-Clay Aboveground Parking Garage would begin after 2016 and is anticipated to be complete by 2020. A more detailed construction schedule for proposed long-term projects at the Pacific Campus would be determined when each project is developed and designed. The hours of construction at the Pacific Campus generally would be from 7 a.m. to 5 p.m. on typical work days (Monday–Friday, excluding holidays). Some work could be done as late as 8 p.m. Construction may occur on select Saturdays from 7 a.m. to 5 p.m. Work is not expected to occur on Sunday. The hours of operation would vary slightly during the projects’ various stages.

Exact construction plans and equipment lists are not available at this time; however, equipment needs and activities associated with construction of buildings and related infrastructure in urban areas would be similar in kind for all construction projects. Noise levels for the demolition and excavation construction phases were calculated with FHWA’s Roadway Construction Noise Model, using typical amounts of construction equipment for demolition and excavation activities. During the most intense phases, construction noise generated at the Pacific Campus could reach 80 dB L_{eq} at 100 feet. Project construction noise levels at the nearest sensitive receptors to the Pacific Campus are shown below in Table 4.6-25, “Exposure of Sensitive Receptors near the Pacific Campus to Construction Noise.”

As shown in Table 4.6-25, ambient noise levels at noise-sensitive receptors near the Pacific Campus would increase by between 11 dB and 31 dB as a result of project construction. The maximum noise level generated by project construction activities at the exterior of these land uses could be up to 91 dB. During excavation,

Table 4.6-25
Exposure of Sensitive Receptors near the Pacific Campus to Construction Noise

Sensitive Receptor	Existing Noise Level (dB)	Distance (feet)	Modeled Construction Noise Level (dB, L_{eq})	Exceeds Ambient (dB)
On-site sensitive receptors (patients, staff)	62	**50**	**87**	+25
2100–2300 Webster Street residences	65	125	79	+14
2300–2400 Washington Street residences	60	**30**	**91**	+31
2200–2400 Buchanan Street residences	62	250	73	+11
2200–2500 Clay Street residences	62	170	76	+14
2300–2500 Sacramento Street residences/Marin Day School Playground	64	**100**	**81**	+17

Notes: dB = (A-weighted) decibels; L_{eq} = equivalent noise level (hourly)
Boldface indicates noise level in excess of 80 dB at 100 feet or less from the noise source.
Source: Data calculated by AECOM in 2010

demolition, and foundation construction, it is expected that the construction noise would be shielded partially or completely by the existing Pacific Campus building façades and the eventual walls of the excavated pit as construction work progresses. Demolition of the existing Gerbode Research Building (2200 Webster Street) and Annex MOB (2340–2360 Clay Street) would occur approximately 50 feet from the Stern Building (2330 Clay Street), the 2333 Buchanan Street Hospital, and Pacific Professional Building (2100 Webster Street), resulting in a 25-dB increase in interior noise levels.

On-campus sensitive receptors would be patients and hospital staff occupying the existing Pacific Campus buildings. Noise from construction could reach approximately 87 dB at the exterior walls. The existing buildings are assumed to have an exterior-to-interior noise level reduction of 30 dB from the building façades attributable to noise reductions from concrete façade construction. Interior noise levels resulting from construction noise would be 57 dB in rooms adjacent to the Pacific Campus construction areas. The hospital is equipped with fixed windows, and ambient interior-noise levels are expected to be above the predicted interior construction-noise levels because of daily hospital activities. However, although construction activities might exceed the noise levels recommended for hospitals, this would only occur during daytime hours. Off-campus sensitive receptors at residencies on Washington Street and Sacramento Street also would experience daytime construction noise in excess of 80 dB.

In summary, noise generated by long-term construction activities at the Pacific Campus would exceed 80 dB at 100 feet at three receptor locations. No construction would take place during the noise-sensitive nighttime hours. Thus, long-term construction at this campus is not expected to comply with the San Francisco Noise Control Ordinance daytime standard. During the daytime hours, on-campus noise-sensitive receptors (patients and staff occupying the existing Pacific Campus buildings) may experience elevated interior noise levels, including noise levels exceeding those recommended for hospitals. Therefore, **this impact would be potentially significant**.

Mitigation Measure for Pacific Campus

M-NO-L1 This mitigation measure is identical to Mitigation Measures M-NO-N1a, M-NO-N1b, and M-NO-N1c for the Cathedral Hill Campus.

For the same reasons as described for near-term projects at the Davies Campus, **implementing Mitigation Measure M-NO-L1 at the Pacific Campus would reduce Impact NO-1 to a less-than-significant level**.

◆ Davies Campus

In the long term, the existing on-campus 290-space garage at 14th and Castro Streets would be demolished and a new MOB (the proposed Castro Street/14th Street MOB) would be constructed on the parking garage site by 2020 to meet the future anticipated need for medical office space at the Davies Campus. The approximately 264,900-square-foot, 45-foot-tall, three-story Castro Street/14th Street MOB would contain medical offices, building infrastructure, lobby space, and mechanical and electrical spaces, and would include four levels of parking totaling approximately 184,000 square feet and provide 490 parking spaces. Removal of existing large mature trees along the east side of Castro Street and along 14th Street near the Castro Street/14th Street intersection also would occur in conjunction with the demolition of the existing parking garage.

The construction phasing for the Castro Street/14th Street MOB is not available at this time; however, it would likely be similar to other building construction phasing in that it would require demolition, clearing, grading, excavation, foundation pouring, structure erection, exterior enclosure, interior buildout, finishing, and other miscellaneous activities. The overall construction phase is expected to be approximately 2 years.

Construction noise levels and exposure of sensitive receptors under the long-term projects for the Davies Campus would be similar to those under the near-term project. That is, noise generated by construction would not exceed 80 dB at 100 feet and exposure of sensitive receptors would be similar to that presented in Table 4.6-23, “Exposure of Sensitive Receptors near the Davies Campus to Construction Noise” (page 4.6-38). Construction activities would be restricted to 7 a.m. to 8 p.m., unless a special permit is issued.

In summary, noise generated by long-term construction at the Davies Campus would not exceed 80 dB at 100 feet, nor would construction take place during the noise-sensitive nighttime hours. Thus, long-term construction at this campus would comply with the San Francisco Noise Control Ordinance. However, during the daytime hours, on-site noise sensitive receptors (patients and staff occupying the Davies Hospital North and South Towers) would experience elevated interior noise levels, including noise levels exceeding those recommended for hospitals. Therefore, as a conservative conclusion, **this impact would be potentially significant**.

Mitigation Measure for Davies Campus (long term)

M-NO-L1 This mitigation measure is identical to Mitigation Measures M-NO-N1a, M-NO-N1b, and M-NO-N1c for the Cathedral Hill Campus.

For the same reasons as described for near-term projects at the Davies Campus, **implementing Mitigation Measure M-NO-L1 at the Davies Campus would reduce Impact NO-1 to a less-than-significant level in the long term**.

IMPACT NO-2 *Project operation could cause a substantial permanent increase in traffic noise levels at noise-sensitive residential receptors and/or expose noise-sensitive receptors to a substantial increase in noise levels. (Significance Criterion 6c)*

Levels of significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Traffic-related noise increases resulting from implementation of the CPMC LRDP were evaluated based on whether they would result in a substantial increase (+3 dB) in traffic noise at on- and off-site sensitive receptors. The FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) was used to model traffic noise levels along affected roadways, based on daily traffic volumes and their distribution, from the traffic analysis prepared for the full buildout of near-term projects and long-term projects in 2015 and 2030, respectively.[39] The contribution of the LRDP development projects to the existing traffic noise levels along area roadways was determined by comparing the modeled noise levels at 50 feet from the roadway centerline under no-project and plus-project conditions for baseline and cumulative conditions. Modeling assumed flat topographical conditions and did not include offsets to account for site-specific roadway conditions. The analyses below only evaluate the permanent change in traffic noise levels because of the increase in daily traffic volumes. The use of emergency sirens, horns, and lights could cause a temporary elevation of ambient noise levels on an intermittent basis at nearby noise-sensitive land uses. However, emergency vehicles and noise generated from the operation of emergency sirens

[39] These correspond with the project-level and program-level CEQA analyses, respectively.

and horns while accessing the proposed new medical facilities are considered exempt from the noise-related provisions of the San Francisco Municipal Code.

Near-Term Projects

◆ Cathedral Hill Campus

Operation of the proposed Cathedral Hill Campus under the LRDP could result in an increase in average daily vehicle trips in the campus area. The majority of trips would occur during the a.m. and p.m. peak periods. Thus, impacts throughout the day and during nighttime would be minor. The increased traffic volumes could result in a noticeable (3-dB or greater) increase in traffic noise along roadways on and near the campus. Operation of the Cathedral Hill Campus would result in an increase in average daily traffic (ADT) volumes on the local roadway network. To examine the effect of project-generated traffic increases, traffic noise levels associated with the Cathedral Hill Campus were calculated for roadway segments near the campus. Traffic noise levels were modeled under baseline and cumulative conditions, with and without operation of the proposed Cathedral Hill Campus. Traffic volumes for each study segment were derived from p.m.-peak intersection turning movements provided by the project traffic consultant (Fehr & Peers Transportation Consultants), using a K Factor (multiplication factor used to compute ADT) of 10 to compute the average daily trips on roadway segments. Vehicle speeds and truck volumes on local roadways were determined based on field observations conducted by AECOM. Table 4.6-26, “Predicted Future Traffic Noise Levels—Cathedral Hill Campus,” summarizes the modeled traffic noise levels at 50 feet from the centerline of affected roadway segments near the Cathedral Hill Campus.

Based on the modeling conducted, the following changes would occur with operation of the proposed Cathedral Hill Campus under the LRDP, compared to noise levels without the project:

- With Cathedral Hill Campus operation under the LRDP, in addition to either baseline (2015) or cumulative (2030) conditions, changes in traffic noise levels would range from a net improvement (-0.2 dB) to a net increase of 10.3 dB L_{dn} (along Cedar Street only).
- LRDP-related traffic noise would result in a noticeable (+3 dB or greater) increase in ambient traffic noise levels along Cedar Street (between Polk Street and Van Ness Avenue). This increase most likely would be perceivable to existing, nearby noise-sensitive receptors.
- For all other roadway segments, project-related traffic noise would not result in a noticeable increase in ambient traffic noise levels. Any change most likely would not be perceivable to existing, nearby noise-sensitive receptors.

Table 4.6-26
Predicted Future Traffic Noise Levels—Cathedral Hill Campus

Roadway	Segment		L_{dn} at 50 Feet, dB							
	From	To	Baseline (2015) No Project	Baseline (2015) Plus Project	Net Change	+3 dB Increase	Cumulative (2030) No Project	Cumulative (2030) Plus Project	Net Change	+3 dB Increase
Franklin St	Bush St	Sutter St	72.6	72.6	0.0	No	72.8	82.6	9.8	No
Franklin St	Sutter St	Post St	72.4	72.4	0.0	No	72.7	72.7	0.0	No
Franklin St	Post St	Geary Blvd	72.8	72.7	-0.1	No	73.0	73.0	0.0	No
Franklin St	Geary Blvd	O’Farrell St	73.3	73.2	0.0	No	73.6	73.5	-0.1	No
Van Ness Ave	Sutter St	Post St	74.8	75.0	0.2	No	75.4	75.5	0.1	No
Van Ness Ave	Post St	Geary Blvd	75.1	75.2	0.1	No	75.6	75.7	0.1	No
Van Ness Ave	Geary Blvd	O’Farrell St	75.2	75.3	0.1	No	75.7	75.8	0.1	No
Polk St	Post St	Cedar St	65.5	65.8	0.3	No	65.9	66.2	0.3	No
Polk St	Cedar St	Geary Blvd	65.6	66.5	0.9	No	65.9	66.8	0.9	No
Polk St	Geary Blvd	O’Farrell St	65.0	65.6	0.5	No	65.3	65.8	0.5	No
Sutter St	Gough St	Franklin St	65.1	65.4	0.3	No	65.8	66.1	0.3	No
Sutter St	Franklin St	Van Ness Ave	66.0	66.5	0.5	No	66.7	67.1	0.4	No
Post St	Gough St	Franklin St	66.0	66.1	0.1	No	66.6	66.7	0.1	No
Post St	Franklin St	Van Ness Ave	67.4	67.1	-0.3	No	67.9	67.7	-0.2	No
Post St	Van Ness Ave	Polk St	66.7	67.0	0.3	No	67.4	67.6	0.2	No
Geary Blvd	Gough St	Franklin St	75.3	75.4	0.1	No	76.1	76.1	0.0	No
Geary Blvd	Franklin St	Van Ness Ave	72.0	72.0	0.0	No	72.7	72.7	0.0	No
Geary Blvd	Van Ness Ave	Polk St	71.6	72.0	0.4	No	72.1	75.2	3.1	No
Cedar St	Polk St	Van Ness Ave	52.0	62.3	10.3	No[1]	52.0	62.3	10.3	No[1]

Notes: dB = (A-weighted) decibels; L_{dn} = day-night average noise level
Traffic noise levels are predicted at a standard distance of 50 feet from the roadway centerline and do not account for shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.
[1] Existing measured noise levels on Cedar Street were 60.8 dB L_{eq} as shown in Table 4.6-4 “Existing Ambient Noise Levels—Cathedral Hill Campus.” Therefore, comparing measured ambient noise levels to future modeled traffic noise levels, the increase (+2.3 dB) in traffic noise levels would be less than significant.
Source: Data modeled by AECOM in 2010

Existing measured noise levels on Cedar Street were 60.8 dB L_{eq}, as shown in Table 4.6-4, “Existing Ambient Noise Levels—Cathedral Hill Campus,” whereas the future modeled baseline is 52.0 dB L_{eq} at that location, as shown in Table 4.6-26. The difference in traffic noise levels between the measured and modeled noise levels along Cedar Street is attributable to traffic noise generated by Van Ness Avenue and Polk Street flanking down Cedar Street. Therefore, when comparing measured ambient noise levels to future modeled traffic noise levels, the increase (approximately +2 dB) in traffic noise levels would be less than significant. As a result, implementation of the LRDP at the proposed Cathedral Hill Campus would not result in a noticeable increase in ambient traffic noise along Cedar Street. Therefore, **this impact would be less than significant**.

Cathedral Hill Campus with Project Variants: Implementation of the project variants for the Cathedral Hill Campus—the No Van Ness Avenue Pedestrian Tunnel, Two-Way Post Street, and MOB Access Variants—would not alter traffic volumes generated by uses at the proposed campus. Therefore, for the same reasons as discussed above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill Campus in the near term.

◆ Davies Campus

Operation of the Davies Campus under the LRDP could result in an increase in average daily vehicle trips in the campus area. The increased traffic volumes could result in a noticeable (3-dB or greater) increase in traffic noise along roadways on and near the campus. Operation of the Davies Campus would result in an increase in ADT volumes on the local roadway network. To examine the effect of project-generated traffic increases, traffic noise levels associated with the Davies Campus were calculated for roadway segments near the campus. (See the description of modeling in the discussion of the proposed Cathedral Hill Campus, above.) Table 4.6-27, “Predicted Future Traffic Noise Levels—Davies Campus” below, which summarizes the modeled traffic noise levels at 50 feet from the centerline of affected roadway segments near the Davies Campus.

Based on the modeling conducted, the following changes would occur with operation of the Davies Campus under the LRDP, compared to noise levels without the LRDP:

- With campus operation under the LRDP, in addition to baseline conditions, net increases in traffic noise levels would range from 0.1 dB to 0.7 dB L_{dn}.
- With campus operation under the LRDP, in addition to cumulative conditions, net increases in traffic noise levels would range from 0.1 dB to 0.8 dB L_{dn}.

Therefore, project-related traffic noise would not result in a noticeable increase in ambient traffic noise levels (3 dB or greater) and most likely would not be perceivable to existing noise-sensitive receptors. As a result, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the near term.

Table 4.6-27
Predicted Future Traffic Noise Levels—Davies Campus

Roadway	Segment		L_{dn} at 50 Feet, dB							
	From	To	Baseline (2015) No Project	Baseline (2015) Plus Project	Net Change	+3 dB Increase	Cumulative (2030) No Project	Cumulative (2030) Plus Project	Net Change	+3 dB Increase
Castro St	Haight St	Duboce Ave	68.3	68.4	0.1	No	68.5	68.7	0.2	No
Castro St	Duboce Ave	14th St	68.3	68.4	0.1	No	68.8	68.9	0.1	No
Castro St	14th St	Market St	68.1	68.1	0.0	No	68.5	68.6	0.1	No
Noe St	Duboce Ave	14th St	63.1	63.3	0.2	No	63.3	63.5	0.2	No
Duboce Ave	Castro St	Scott St	62.2	62.5	0.3	No	62.4	62.7	0.3	No
Duboce Ave	Scott St	Noe St	63.6	63.8	0.2	No	63.8	64.0	0.2	No
Duboce Ave	Noe St	Sanchez St	61.3	61.4	0.1	No	61.5	61.7	0.2	No
14th St	Castro St	Noe St	62.6	62.6	0.0	No	62.6	62.8	0.2	No
14th St	Noe St	Market St	63.1	63.8	0.7	No	63.2	64.0	0.8	No

Notes: dB = (A-weighted) decibels; L_{dn} = day-night average noise level.
Traffic noise levels are predicted at a standard distance of 50 feet from the roadway centerline and do not account for shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.
Source: Data modeled by AECOM in 2010

◆ St. Luke's Campus

Operation of the St. Luke's Campus under the LRDP could result in an increase in average daily vehicle trips in the campus area. The increased traffic volumes could result in a noticeable (3-dB or greater) increase in traffic noise along roadways on and near the campus site. Operation of the St. Luke's Campus would result in an increase in ADT volumes on the local roadway network. To examine the effect of project-generated traffic increases, traffic noise levels associated with the St. Luke's Campus were calculated for roadway segments near the campus. (See the description of modeling in the discussion of the proposed Cathedral Hill Campus, above). Table 4.6-28, "Predicted Future Traffic Noise Levels—St. Luke's Campus," below summarizes the modeled traffic noise levels at 50 feet from the centerline of affected roadway segments near the St. Luke's Campus. Additional input data—day/night percentages of autos, medium trucks, and heavy trucks; vehicle speeds; and ground attenuation factors—are available for review at the Planning Department.

Based on the modeling conducted, the following changes would occur with operation of the St. Luke's Campus under the LRDP, compared to noise levels without the project:

Table 4.6-28
Predicted Future Traffic Noise Levels—St. Luke's Campus

Roadway	Segment		L_{dn} at 50 Feet, dB							
	From	To	Baseline (2015) No Project	Baseline (2015) Plus Project	Net Change	+3 dB Increase	Cumulative (2030) No Project	Cumulative (2030) Plus Project	Net Change	+3 dB Increase
Valencia St	26th St	Cesar Chavez St	66.6	66.7	0.1	No	66.9	67.0	0.1	No
Valencia St	Cesar Chavez St	Duncan St	64.9	65.0	0.1	No	65.3	65.4	0.1	No
Valencia St	Duncan St	Mission St	64.5	64.6	0.1	No	64.8	64.9	0.1	No
Cesar Chavez St	Guerrero St	Valencia St	71.7	71.9	0.2	No	72.6	72.7	0.1	No
Cesar Chavez St	Valencia St	Bartlett St	72.0	72.3	0.3	No	72.9	73.0	0.1	No
27th St	Guerrero St	San Jose Ave	56.9	56.9	0.0	No	57.1	57.1	0.0	No
Duncan St	Guerrero St	Valencia St	59.0	59.1	0.1	No	59.4	59.5	0.1	No

Notes: dB = A-weighted decibels; L_{dn} = day-night average noise level.
Traffic noise levels are predicted at a standard distance of 50 feet from the roadway centerline and do not account for shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.
Source: Data modeled by AECOM in 2010

- With campus operation under the LRDP, in addition to baseline conditions, changes in traffic noise levels would range from no net change (0.0 dB) to a net increase of 0.3 dB L_{dn}.
- With campus operation under the LRDP, in addition to cumulative conditions, net increases in traffic noise levels would range from no net change (0.0 dB) to 0.1 dB L_{dn}.

Therefore, project-related traffic noise would not result in a noticeable increase in ambient traffic noise levels (3 dB or greater) and most likely would not be perceivable to existing noise-sensitive receptors. As a result, **this impact would be less than significant**.

St. Luke's Campus with Project Variants: The project variants for the St. Luke's Campus would not alter the volume of traffic generated by near-term campus operation. The Alternate Emergency Department Location Variant would affect how emergency and delivery vehicles access the Emergency Department and the loading dock of the proposed St. Luke's Replacement Hospital; however, this would not change the overall project-generated traffic noise. Therefore, for the same reasons as discussed above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the St. Luke's Campus in the near term.

Long-Term Projects

◆ Pacific Campus

Operation of the Pacific Campus under the LRDP could result in an increase in average daily vehicle trips in the campus area. The increased traffic volumes could result in a noticeable (3-dB or greater) increase in traffic noise along roadways on and near the campus site. Operation of the Pacific Campus would result in an increase in ADT volumes on the local roadway network. To examine the effect of project-generated traffic increases, traffic noise levels associated with the Pacific Campus were calculated for roadway segments near the campus. (See the description of modeling in the discussion of near-term projects at the proposed Cathedral Hill Campus, above.) Table 4.6-29, "Predicted Future Traffic Noise Levels—Pacific Campus," summarizes the modeled traffic noise levels at 50 feet from the centerline of affected roadway segments near the Pacific Campus.

Table 4.6-29
Predicted Future Traffic Noise Levels—Pacific Campus

Roadway	Segment		L_{dn} at 50 Feet, dB							
	From	To	Baseline (2015) No Project	Baseline (2015) Plus Project	Net Change	+3 dB Increase	Cumulative (2030) No Project	Cumulative (2030) Plus Project	Net Change	+3 dB Increase
Fillmore St	Clay St	Sacramento St	64.6	66.1	1.5	No	64.8	64.8	0.0	No
Webster St	Washington St	Clay St	63.0	63.1	0.1	No	63.3	63.3	0.0	No
Webster St	Clay St	Sacramento St	65.0	65.0	0.0	No	65.1	65.1	0.0	No
Webster St	Sacramento St	California St	65.5	65.5	0.0	No	65.8	65.8	0.0	No
Buchanan St	Washington St	Clay St	62.7	62.9	0.2	No	62.8	63.0	0.2	No
Buchanan St	Clay St	Sacramento St	62.6	62.7	0.1	No	62.6	62.8	0.2	No
Buchanan St	Sacramento St	California St	62.4	62.4	0.0	No	62.5	62.6	0.1	No
Washington St	Webster St	Buchanan St	59.9	60.0	0.1	No	60.8	60.9	0.1	No
Clay St	Fillmore St	Webster St	61.2	61.3	0.1	No	61.5	61.5	0.0	No
Clay St	Webster St	Buchanan St	53.2	54.6	1.4	No	53.3	54.7	1.4	No
Sacramento St	Fillmore St	Webster St	64.0	64.1	0.1	No	65.0	65.2	0.2	No
Sacramento St	Webster St	Buchanan St	63.4	63.6	0.2	No	64.4	64.6	0.2	No
California St	Webster St	Buchanan St	67.8	67.8	0.0	No	68.0	68.0	0.0	No

Notes: dB = A-weighted decibels; L_{dn} = day-night average noise level.
Traffic noise levels are predicted at a standard distance of 50 feet from the roadway centerline and do not account for shielding from existing noise barriers or intervening structures. Traffic noise levels may vary depending on actual setback distances and localized shielding.
Source: Data modeled by AECOM in 2010

Based on the modeling conducted, the following changes would occur with operation of the Pacific Campus under the LRDP, compared to noise levels without the project:

- With campus operation under the LRDP, in addition to baseline conditions, changes in traffic noise levels would range from no net change (0.0 dB) to a net increase of 1.4 dB L_{dn}.
- With campus operation under the LRDP, in addition to cumulative conditions, changes in traffic noise levels would range from no net change (0.0 dB) to 1.4 dB L_{dn}.

Therefore, long-term noise levels from project-generated traffic sources would not result in a noticeable increase in ambient traffic noise levels (3 dB or greater) and most likely would not be perceivable to existing noise-sensitive receptors. As a result, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific Campus in the long term.

◆ Davies Campus

As shown above in Table 4.6-27, “Predicted Future Traffic Noise Levels—Davies Campus” (page 4.6-61), operation of the Davies Campus under the LRDP would not result in a noticeable increase in traffic noise levels (3 dB or greater), compared to noise levels without the LRDP. As a result, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the long term.

IMPACT NO-3

Operation of stationary noise sources associated with the CPMC LRDP could expose on-site and off-site noise-sensitive receptors to noise levels that would exceed applicable standards, and/or result in a substantial increase in ambient noise levels. (Significance Criteria 6a and 6d)

Levels of significance:

- *Cathedral Hill (with or without project variants): Less than significant with mitigation*
- *Pacific: Less than significant with mitigation*
- *Davies (near term): Less than significant with mitigation*
- *Davies (long term): Less than significant with mitigation*
- *St. Luke’s (with or without either project variant): Less than significant with mitigation*

Near-Term Projects

Near-term projects proposed for the CPMC campuses would introduce on-site stationary noise sources associated with the support and operation of campus facilities. Stationary noise sources associated with facility operations at the proposed campuses may include rooftop HVAC equipment, emergency generators, Aduromed[40] operations, parking lot activities, and loading activities at loading docks. The effects of stationary-source noise in the vicinity of campus sites that would occur as a result of near-term project implementation are discussed below. No changes in facilities are proposed at the California Campus; therefore, no impact would occur at that campus.

◆ Cathedral Hill Campus

Stationary Equipment

Exterior HVAC equipment, intake and exhaust fans, and emergency generators would be mounted on the rooftops of Level 5 (kitchen exhaust fans), Level 7 (HVAC), Level 15 (HVAC), and Level 16 (HVAC and emergency generators) of the proposed Cathedral Hill Hospital and on the rooftop of Level 10 of the proposed Cathedral Hill MOB. The mechanical equipment that would be used includes air handling units, fans, pumps, air compressors, chillers, and cooling towers. As stated in Chapter 2, "Project Description," the proposed Cathedral Hill Hospital and MOB are both assumed to incorporate rooftop mechanical screens, HVAC cabinet enclosures, and exhaust mufflers to prevent excessive noise exposure from HVAC equipment. No changes to exterior equipment are proposed for the 1375 Sutter MOB; thus, mechanical equipment at this building will not be discussed below.

Noise levels from HVAC equipment vary substantially depending on unit efficiency, size, model type, and locations. Shen Milson & Wilke (SM&W) consultants have identified the specific type and quantity of HVAC equipment to be installed at the Cathedral Hill Campus in separate technical reports conducted specifically for this campus.[41] To ensure compliance with Section 2909, "Noise Limits," of Article 29 of the San Francisco Noise Control Ordinance, SM&W established existing noise levels to apply the noise level criteria of 8 dB above the ambient noise level at the property lines of the proposed campus through on-site noise measurements.[42]

Based on sound power levels[43] provided by the manufacturer, existing noise levels, orientation of exterior equipment, and combined noise levels of equipment located in close proximity, SM&W developed maximum sound power ratings to be achieved at the property plane (vertical plane including the property line that

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[40] An Aduromed is a medical waste disposal system comprised of an autoclave sterilizer, a shredder with a cart lift, a dumpster, a floor scale, and controls.

[41] Shen Milsom & Wilke. 2009 (January 15). *CPMC—Cathedral Hill Hospital, Updated Air Handling Unit OA and EA Opening Recommendations,* Technical memorandum. San Francisco, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

[42] Ibid.

[43] The sound power level is a measure of the total sound power radiated by the source in all directions and is usually stated as a function of frequency.

determines the property boundaries in space) for HVAC equipment (air handling equipment[44] and cooling towers[45]), emergency generators,[46] and exhaust fans[47] to comply with the City's Section 2909 noise limit standard.

Three emergency generators (3,000-kilowatt [kW] generators) would be located on the Level 16 roof of the Cathedral Hill Hospital, just south of air handling units and cooling towers. Emergency generators of this size generate an unmitigated noise level of 107.6 dB at a distance of 3 feet.[48] A single 1,500-kW emergency generator is proposed to be located on the rooftop for the Cathedral Hill MOB. An emergency generator of this size generates an unmitigated noise level of 100.3 dB at a distance of 3 feet.[49] These generators would only run during emergency periods and for scheduled testing that typically runs for 30 minutes. The manufacturer would be expected to design the equipment at the factory to achieve the SM&W-developed sound power ratings at the exterior of individual equipment cabinets, by using measures such as attenuators and acoustical lining. Before installation of the exterior equipment at the Cathedral Hill Campus buildings, an SM&W consultant would also confirm that the manufacturer has incorporated noise reduction measures into the equipment's design. It is expected that design features incorporated into stationary equipment would reduce noise generation, so that noise levels would not exceed 8 dB beyond the existing noise level at the property plane (and thus would comply with Section 2909, "Noise Limits," of Article 29 of the San Francisco Noise Control Ordinance), and would not result in a substantial permanent increase in ambient noise levels.

On- and off-campus receptors would be exposed to stationary noise generated by the equipment discussed above. On-campus receptors of concern would be the patients located in rooms on Level 5 of the proposed Cathedral Hill Hospital, adjacent to exterior kitchen exhaust fans. Based on the technical report prepared by SM&W,[50] noise from kitchen exhaust fans would generate noise levels at interior spaces of Level 5 patient rooms that would be at the high end for interior noise levels (45 dB L_{dn}). Therefore, noise from kitchen exhaust fans may expose patients to interior noise levels that would not comply with applicable standards and could be excessive.

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[44] Shen Milsom & Wilke. 2009 (January 15). *CPMC—Cathedral Hill Hospital, Updated Air Handling Unit OA and EA Opening Recommendations,* Technical memorandum. San Francisco, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

[45] Shen Milsom & Wilke. 2009 (January 16). *CPMC—Cathedral Hill Hospital, Cooling Tower Recommendations,* Technical memorandum. San Francisco, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

[46] Shen Milsom & Wilke. 2009 (September 24). *CPMC—Cathedral Hill Hospital, Emergency Generator Recommendations—Updated,* Technical memorandum. San Francisco, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

[47] Shen Milsom & Wilke. 2009 (May 1). *CPMC—Cathedral Hill Hospital, Kitchen Exhaust Fan Airborne Noise Analysis—Updated,* Technical memorandum. San Francisco, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

[48] Shen Milsom & Wilke. 2008 (July 30). *Proposed Noise Sources CPMC—Cathedral Hill Hospital.* Francisco, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

[49] Ibid.

[50] Ibid.

Off-campus receptors of concern would be the residents located at 1 Daniel Burnham Court (across Post Street to the north), residential uses along Geary Boulevard, and Hamilton Square Baptist Church and First Unitarian Universalist Church located on the north and south sides, respectively, of Geary Boulevard at Franklin Street. The 1 Daniel Burnham Court residential towers have two upper-level outdoor terrace with swimming pools directly across Post Street from the site of the proposed Cathedral Hill Hospital, including one at the third-floor level of the west tower at the corner of Franklin and Post Streets and at the fifth floor level at the corner of Van Ness Avenue and Post Street). The other noise-sensitive uses do not have outdoor activity areas adjacent to the proposed Cathedral Hill Campus; thus, stationary equipment shall comply with Section 2909, "Noise Limits," of Article 29 of the San Francisco Noise Control Ordinance for fixed residential interior noise limits (45 dB between 10 p.m. and 7 a.m. and 55 dB between 7 a.m. and 10 p.m.). Based on the technical reports prepared by SM&W, noise attributable to exterior equipment would not exceed 70 dB at any property line of the proposed Cathedral Hill Campus. Assuming a conservative exterior-to-interior noise level reduction of 25 dB for modern residential wood construction and accounting for distance to the nearest off-site sensitive receptor façade, off-site sensitive receptors would not be exposed to interior noise levels exceeding 45 dB or experience a substantial increase in interior ambient noise levels with windows closed. Provided that off-site sensitive receptors have their windows open, only a 15-dB reduction is expected and interior noise levels may exceed 45 dB.

Parking Garage Activities

As stated in Chapter 2, "Project Description," the proposed Cathedral Hill Hospital would include a three-level underground parking garage containing 513 spaces, with entries and exits on Geary Boulevard and Post Street. The proposed Cathedral Hill MOB would also have a six-level underground parking garage with 542 spaces and entries/exits on Geary Street and Cedar Street. The existing office building at 1375 Sutter Street contains a parking garage with 172 spaces.

Intermittent parking lot noise would include vehicles entering and leaving the parking garages, tires squealing, doors closing, music playing, and occasionally car alarms going off. Adjacent noise-sensitive receptors would not be fully exposed to underground parking lot noise, because these areas would be mostly enclosed, with openings only at the aboveground entries and exits. Noise generated by vehicles entering or exiting the parking garages is expected to be intermittent and masked by noise from traffic already traveling along the adjacent roadways. As a result, parking lot noise would not exceed the City's noise limit of 8 dB above the ambient noise level at the property line, nor would this noise result in a substantial increase in ambient noise levels in the project vicinity above levels existing without the project.

Passenger and Shuttle Drop-Offs

Noise associated with the three proposed drop-off areas (Cedar Street passenger drop-off, MOB drop-off on Van Ness Avenue, and Post Street shuttle drop-off) at the Cathedral Hill Campus would be from vehicles dropping off passengers/riders. It is assumed that drop-offs would be relatively short-term individual events. Reference noise-level data from previously measured parking lot events were used to quantify noise levels associated with patient drop-off events and were assumed to generate similar noise levels. Like parking, patient drop-off events are expected to generate noise from vehicle arrival, idling, occupants exiting the vehicle, door closures, conversations among passengers, occupants entering the vehicle, startup, and departure of the vehicle. Previously conducted measurements of reference noise levels for parking lot activities indicate that the average sound exposure level (SEL) associated with a single parking event is 71 dB SEL at distance of 50 feet. Assuming 30 patient drop-off events per hour for Cathedral Hill Hospital, 101 for the Cathedral Hill MOB, and 35 for 1375 Sutter MOB, the resulting hourly noise levels would be 50 dB, 55 dB, and 51 dB L_{eq} at 50 feet, respectively.

The sensitive receptors of concern associated with drop-off events would be the occupants of the proposed Cathedral Hill Hospital and Cathedral Hill MOB. The nearest building façade exposed to patient drop-offs at the Cathedral Hill Campus would be the proposed Cathedral Hill MOB at 25 feet. Therefore, noise levels from patient drop-off events are expected to be 56 dB L_{eq} at the façade of the proposed Cathedral Hill MOB. Assuming an exterior-to-interior noise level reduction of 30 dB associated with standard concrete building practices, interior noise levels resulting from drop-off events are predicted to be 28 dB L_{eq} for occupants of the proposed Cathedral Hill MOB. It can be assumed that the other sensitive receptors of concern would have lower drop-off event-related interior noise levels because they would be farther from the drop-off areas. Therefore, patient drop-off activities would not exceed interior noise levels of 45 dB, nor would such activities result in a substantial increase in ambient noise levels in the campus vicinity above existing levels.

Loading Dock and Delivery Activity

A loading dock with operable bay doors would be enclosed within the proposed Cathedral Hill Hospital building and would be accessed from Franklin Street. The operable bay doors are intended to be shut after arrival of a delivery truck and during normal loading-dock operations. No changes to loading activities would occur at the 1375 Sutter MOB; the loading activities at the proposed Cathedral Hill MOB would occur within the garage near the service entrance accessed from Cedar Street, and would be comparable to the activities that occur at the site under existing conditions.

Noise sources associated with deliveries to the Cathedral Hill Hospital's loading dock would include idling trucks, on-site circulation of trucks, trailer-mounted refrigeration units, back-up beepers, roll-down doors, and the operation of forklifts. Movement of delivery trucks inside the loading dock would make the greatest contribution to noise levels. Loading-dock activities would benefit from interior-to-exterior noise reductions (conservatively assumed to be -10 dB), because activities would be enclosed within the building.

Previously conducted noise monitoring at loading docks indicates that typical hourly average noise levels range from 60 to 65 dB L_{eq} and from 85 to 89 dB L_{max} at a distance of 50 feet. Accounting for the distance from the center of the loading-dock area to the project property line, as well as for loading-dock façade reductions, predicted normal noise levels attributable to the hospital's loading dock would range from 48 to 53 dB L_{eq} and from 73 to 77 dB L_{max} at the project property line. However, based on the technical report prepared by SM&W, operation of the Aduromed medical waste equipment would dominate the loading dock's noise environment during use.[51] The analysis predicted noise levels of 56 dB at the property line with the loading dock's door closed; however, if the operation of the Aduromed occurs with the doors open, the resulting noise level would be 79 dB at the Franklin Street property plane. It was determined in the technical report that this noise level would exceed the existing ambient noise level at the property line by more than 8 dB, if doors are open. As a result, operation of the Aduromed medical waste processing unit would exceed the City's noise limit of 8 dB above the ambient noise level at the property line and would result in a substantial permanent increase in ambient noise levels in the campus vicinity above existing levels, if doors are open during operation.

In addition to other loading-dock noise, noise may result from delivery of bulk liquid oxygen at the loading-dock area of the Cathedral Hill Campus. Liquid oxygen would be delivered on Franklin Street, adjacent to storage tanks, approximately two times a week or as needed. The dominant noise source during these deliveries would be the steady revving of the truck engine during pumping of the liquid oxygen. Other noise sources include a hydraulic oil cooler just behind the truck cab and the sound of some gas venting at the rear of the truck where a hose would connect to the storage tank. Sound levels were measured during a typical delivery, during which the delivery truck was parked for 50 minutes and pumping continued for 22 minutes. The average noise level for the entire time the delivery truck was parked at the storage tank, including pumping, was 82 L_{eq} dB at 35 feet and the average noise level attributable to pumping was 85 L_{eq} dB at 33 feet.[52] Deliveries are expected to take place during off-peak traffic hours to reduce the safety risk for the operator and to avoid traffic congestion. The nearest noise-sensitive receptor to delivery operations would be the Hamilton Square Baptist Church, 65 feet from the proposed location of the delivery truck. When propagated to the church façade, noise from the oxygen delivery truck would result in an exterior noise level of 77 dB L_{eq}. An exterior-to-interior noise level reduction of noise from the oxygen delivery truck would result in noise levels within the church ranging from 47 to 52 dB. Increased interior-noise levels may be experienced temporarily by adjacent residences and church users. Noise levels

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[51] Shen Milsom & Wilke. 2009 (April 2). *CPMC—Cathedral Hill Hospital Aduromed Airborne Noise Analysis.* Technical memorandum. San Francisco, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

[52] Rosen Goldberg Der & Lewits, Inc. 2010 (March 12). *Cathedral Hill Hospital Liquid Oxygen Deliveries,* Technical Memorandum. Larkspur, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

generated by delivery of liquid oxygen would expose church users to periodic increases in ambient noise levels and may result in excessive interior noise levels that would exceed applicable noise standards, if oxygen deliveries and church services coincide.

Waste Disposal Activities

Waste disposal activities would occur within the Franklin Street loading dock. Nonmedical waste would be processed, loaded, and unloaded by standard garbage trucks, which are anticipated to produce noise levels equal to or less than those analyzed above under “Loading Dock and Delivery Activity.” The noise emissions from the garbage processing activities undertaken within the loading dock would be limited by Section 2904, “Waste Disposal Services,” of the San Francisco Noise Control Ordinance to 75 dB at a distance of 50 feet from the equipment. Assuming that garbage processing noise meets the standard of 75 dB at 50 feet, and accounting for a conservative -10 dB reduction because of the loading-dock building’s façade, resulting noise levels at the property plane would be 65 dB. As a result, noise from garbage processing activities would not exceed the City’s noise limit of 8 dB above the ambient noise level at the property line, nor would such noise result in a substantial increase in ambient noise levels in the campus vicinity above existing levels.

Ambulance Entrance/Exit

Noise sources associated with the proposed ambulance entrance/exit area would be from ambulances and emergency vehicles dropping off patients. It is assumed that patient drop-offs would be relatively short-term individual events and could require the use of sirens when in close proximity to the hospital entrance. Normal practice would be to turn off the siren within a few blocks of the proposed hospital. When operated, emergency vehicle sirens could generate intermittent L_{max} noise levels up to 106 dB. With the exception of siren use, patient drop-off events were assumed to generate noise levels similar to those measured for parking lot events. Like parking, patient drop-off events are expected to generate noise from vehicle arrival, idling, occupants exiting the vehicle, door closures, conversations among passengers, occupants entering the vehicle, startup, and departure of the vehicle. Therefore, a single patient drop-off event would generate an average SEL noise level of 71 dB SEL at distance of 50 feet. Conservatively assuming 30 patient drop-off events per hour, the resulting hourly noise level would be 50 dB L_{eq} at 50 feet.

The proposed ambulance entrance/exit for the proposed Cathedral Hill Hospital would be located along Post Street, directly across the street from existing residential uses. Traffic noise is considered the dominant noise source in the area, and modeling results indicate that traffic noise levels would be 68 dB at the campus property line. As a result, noise associated with the ambulance entrance/exit, without the use of sirens, would comply with the City’s noise limit of 8 dB above the ambient noise level at the property line; however, such noise could result in a substantial increase in ambient noise levels at nearby sensitive receptors, above existing levels with the frequent use of sirens.

Summary

Noise levels attributable to the proposed Cathedral Hill Hospital's Level 5 kitchen exhaust fans, to Aduromed operations, and to oxygen truck deliveries would exceed the City's noise standards and result in a substantial increase in ambient noise levels. As a result, **this impact would be significant**.

Cathedral Hill Campus with No Van Ness Avenue Pedestrian Tunnel Variant: None of the stationary noise sources that could affect noise-sensitive receptors are associated with the proposed underground pedestrian tunnel beneath Van Ness Avenue. Therefore, removal of the tunnel from near-term projects at the Cathedral Hill Campus under this project variant would not affect project-related generation of stationary-source noise. For the same reasons as discussed above, **this impact would be significant**.

Cathedral Hill Campus with Two-Way Post Street or MOB Access Variant: None of the stationary noise sources that could affect noise-sensitive receptors are associated with the proposed Two-Way Post Street or MOB Access Variant. Therefore, for the same reasons as discussed above, **this impact would be significant**.

Mitigation Measure for Cathedral Hill Campus (with or without project variants)

M-NO-N3a CPMC shall retain the services of a qualified acoustical consultant to measure the sound levels of operating exterior equipment within 30 days after installation. If exterior equipment meets sound-level standards, no further action is required. If exterior equipment does not meet sound-level standards, CPMC shall replace and/or redesign the exterior equipment to meet the City's noise standards. Results of the measurements shall be provided to Hospital Facilities Management/Engineering and the City to show compliance with standards.

M-NO-N3b Bay doors shall be required to be closed during Aduromed operations.

M-NO-N3c If bay doors are open during Aduromed operation, a noise-absorptive material shall be applied to the entire ceiling structure of the loading-dock area to reduce noise levels from Aduromed operations. The material shall have a minimum Noise Reduction Coefficient of 0.75.

M-NO-N3d Noise attenuators shall be included on kitchen exhaust fans located on Level 5 of the Cathedral Hill Hospital adjacent to patient rooms, or the sound power levels of the exhaust fans shall be limited. Hospital Facilities Management/Engineering shall review the effectiveness of attenuators.

M-NO-N3e Delivery of oxygen to the proposed Cathedral Hill Campus shall not be scheduled during hours when church activities are typically taking place. Communication shall be established between the adjacent churches and CPMC, and a mutually acceptable time for delivery of oxygen shall be determined.

These mitigation measures involve implementing physical (e.g., equipment design) and operational (e.g., delivery schedule) impact reduction measures that are considered practical and feasible. Thus, the impact of the operation of stationary noise sources (i.e., mechanical HVAC equipment, emergency electrical generators, Aduromed) would be reduced by implementation of these mitigation measures. As a result, **implementing Mitigation Measures M-NO-N3a through M-NO-N3e at the proposed Cathedral Hill campus would reduce Impact NO-3 to a less-than-significant level**.

◆ Davies Campus

The proposed Neuroscience Institute building at the Davies Campus would be serviced by the existing on-campus central plant for its operational air handling needs, loading dock, existing parking lots, and existing waste disposal facilities. No new parking lot or waste disposal activities are proposed for the building. Therefore, stationary-source noise associated with HVAC equipment, parking lot, and waste disposal activities are not discussed further.

Stationary Equipment

One 500-kW emergency generator would be situated within an enclosure, located at the ground level adjacent to and south of the proposed Neuroscience Institute building. An emergency generator of this size generates an unhoused noise level of approximately 95 dB at a distance of 3 feet.[53] The generators would only run during emergency events and for scheduled testing that typically runs for 30 minutes. The manufacturer would be expected to design the equipment at the factory to achieve the SM&W-developed sound power ratings at the exterior of the equipment cabinet housing, by using measures such as attenuators and acoustical lining. Before installation of the exterior equipment at the Davies Campus, an SM&W consultant would confirm that the manufacturer has incorporated noise reduction measures into the equipment's design. It is expected that design features incorporated into stationary equipment would reduce noise generation, so that noise levels would not exceed 8 dB beyond the existing noise level at the property plane (and thus would comply with Section 2909, "Noise Limits," of Article 29 of the San Francisco Noise Control Ordinance), and would not result in a substantial permanent increase in ambient noise levels.

Patient Drop-Offs

The proposed service drive that would be located between the existing Davies Hospital North Tower and the proposed Neuroscience Institute building would be the only new stationary noise source at the Davies Campus associated with near-term project construction at the Davies Campus, other than the emergency generator discussed above. Patient drop-off events are not anticipated to result in noise impacts at off-site sensitive

[53] Ibid.

receptors, because the intervening building façade for the proposed Neuroscience Institute would provide complete shielding.

Noise associated with the proposed service drive would be from vehicles dropping off patients. It is assumed that patient drop-offs would be relatively short-term individual events. Reference noise-level data from previously measured parking lot events were used to quantify noise levels associated with patient drop-off events and were assumed to generate similar noise levels. Like parking, patient drop-off events are expected to generate noise from vehicle arrival, idling, occupants exiting the vehicle, door closures, conversations among passengers, occupants entering the vehicle, startup, and departure of the vehicle. Previously conducted measurements of reference noise levels for parking lot activities indicate that the average SEL associated with a single parking event is 71 dB SEL at distance of 50 feet. Conservatively assuming 60 patient drop-off events per hour, the resulting hourly noise level would be 53 dB L_{eq} at 50 feet.

The sensitive receptors of concern associated with patient drop-offs would be the occupants of the proposed Neuroscience Institute building and existing occupants of the Davies Hospital North Tower. The nearest building façades for the proposed Neuroscience Institute building and existing North Tower would be located 25 feet and 50 feet, respectively, from the patient drop-off area. Therefore, noise levels from patient drop-off events are expected to be 56 dB L_{eq} and 53 dB L_{eq}, respectively, at the façades of the proposed Neuroscience Institute building and the existing North Tower. Assuming an exterior-to-interior noise level reduction of 30 dB associated with standard practices for concrete buildings, interior noise levels resulting from patient drop-off events are predicted to be 26 dB L_{eq} and 33 dB L_{eq}, respectively, for occupants of the proposed Neuroscience Institute building and the existing North Tower. Therefore, patient drop-off activities would not exceed interior noise-level standards of 45 dB, nor would such activities result in a substantial increase in ambient noise levels in the campus vicinity above existing levels.

Summary

The operation of proposed stationary sources—specifically, emergency generators—at the Davies Campus could potentially generate noise levels that could exceed the City's noise standards and result in a substantial increase in ambient noise levels. As a result, **this impact would be significant**.

Mitigation Measure for Davies Campus

M-NO-N3 CPMC shall retain the services of a qualified acoustical consultant to conduct an additional site-specific noise study to evaluate and establish the appropriate ambient noise levels at the Davies Campus for purposes of a detailed HVAC and emergency-generator noise reduction analysis. The recommendations of the acoustical consultant shall include specific equipment design and operations measures to reduce HVAC and emergency-generator noise to acceptable levels for exterior and interior noise levels as specified in the San Francisco Noise Control Ordinance.

This mitigation measure involves implementing physical (e.g., equipment design) impact reduction measures related to stationary equipment that are considered practical and feasible to achieve compliance with the San Francisco Noise Control Ordinance. Thus, the impact of the operation of stationary noise sources (i.e., an emergency electrical generator) would be reduced by implementation of this mitigation measure. Thus, **implementing Mitigation Measure M-NO-N3 at the Davies Campus would reduce Impact NO-3 to a less-than-significant level**.

◆ St. Luke's Campus

Stationary Equipment

Exterior HVAC equipment (air handling units, cooling towers, and boilers) and emergency generators would be mounted on the Level 6 rooftop of the proposed St. Luke's Replacement Hospital. Exterior HVAC equipment would also be mounted on the Level 6 rooftop of the proposed MOB/Expansion Building. The HVAC mechanical equipment anticipated to be used includes fans, pumps, air compressors, chillers, and cooling towers. Two emergency generators would be mounted on the rooftop of the St. Luke's Replacement Hospital adjacent to the proposed cooling towers. As stated in Chapter 2, "Project Description," both the proposed St. Luke's Replacement Hospital and the MOB/Expansion Building are assumed to incorporate rooftop mechanical screens.

Noise levels from HVAC equipment vary substantially depending on unit efficiency, size, model type, and locations. It is assumed that HVAC equipment used at the St. Luke's Campus would be similar to that discussed above for the Cathedral Hill Campus. The specific type and quantity of HVAC equipment to be installed at the St. Luke's Campus have been identified and include noise attenuators; however, separate technical reports have not been prepared specifically for this campus. To ensure compliance with Section 2909, "Noise Limits," of Article 29 of the San Francisco Noise Control Ordinance, additional technical reports would be required to be prepared establishing existing noise levels to apply the noise level criteria of 8 dB above the ambient noise level at the St. Luke's Campus property line prior to installation. Therefore, rooftop HVAC equipment may exceed the City's noise limit of 8 dB above the ambient noise level at the property line, or may result in a substantial increase in ambient noise levels in the campus vicinity above existing levels.

Two 1,500-kW emergency generators would be located on the Level 6 roof of the St. Luke's Replacement Hospital, just south of air handling units and cooling towers and Cesar Chavez Street. An emergency generator of this size generates an unhoused noise level of 100.3 dB at a distance of 3 feet.[54] These generators would only run during emergency events and for scheduled testing that typically runs for 30 minutes. The manufacturer would be expected to design the equipment at the factory to achieve the SM&W-developed sound power ratings at the exterior of the equipment cabinet housing, by using measures such as attenuators and acoustical lining. Before

[54] Ibid

installation of the exterior equipment on the St. Luke's Replacement Hospital's Level 6 roof, an SM&W consultant would confirm that the manufacturer has incorporated noise reduction measures into the equipment's design. It is expected that design features incorporated into stationary equipment would reduce noise generation, so that noise levels would not exceed 8 dB beyond the existing noise level at the property plane (and thus would comply with Section 2909, "Noise Limits," of Article 29 of the San Francisco Noise Control Ordinance), and would not result in a substantial permanent increase in ambient noise levels.

On-campus receptors would not be exposed to stationary-source noise generated by the HVAC equipment discussed above, because the equipment would be located on the rooftop of both the St. Luke's Replacement Hospital and the MOB/Expansion Building. Off-site receptors of concern would be the residents located adjacent to and west of the proposed replacement hospital along 27th Street and Cesar Chavez Street. These noise-sensitive uses would not have a direct line of sight to rooftop HVAC equipment. However, the potential exists to exceed Section 2909, "Noise Limits," of Article 29 of the San Francisco Noise Control Ordinance for fixed residential interior noise limits (45 dB between 10 p.m. and 7 a.m. and 55 dB between 7 a.m. and 10 p.m.). As a result, off-site sensitive receptors may be exposed to interior noise levels exceeding the applicable standards or may experience a substantial increase in interior ambient noise levels.

Parking Garage Activities

As stated in Chapter 2, "Project Description," the proposed MOB/Expansion Building would include a four-level underground parking garage containing 220 spaces, with entries and exits on Cesar Chavez and Valencia Streets. Intermittent parking lot noise would include vehicles entering and leaving the parking garages, tires squealing, doors closing, music playing, and occasionally car alarms going off. Adjacent noise-sensitive receptors would not be substantially exposed to underground parking lot noise, because these areas would be mostly enclosed, with openings only at the aboveground entries and exits. Noise generated by vehicles entering or exiting the parking garage is expected to be intermittent and masked by traffic already traveling along the adjacent roadways. As a result, parking lot noise would not exceed the City's noise limit of 8 dB above the ambient noise level at the property line, nor would such noise result in a substantial increase in ambient noise levels in the campus vicinity above existing levels.

Patient Drop-Offs

Noise associated with the two proposed white-zone drop-offs (Cesar Chavez Street and San Jose Avenue/27th Street) at the St. Luke's Campus would be from vehicles dropping off patients. It is assumed that patient drop-offs would be relatively short-term individual events. Reference noise-level data from previously measured parking lot events were used to quantify noise levels associated with patient drop-offs and were assumed to generate similar noise levels. Like parking, patient drop-offs are expected to generate noise from vehicle arrival, idling, occupants exiting the vehicle, door closures, conversations among passengers, occupants entering the vehicle, startup, and departure of the vehicle. Previously conducted measurements of reference noise levels for parking lot activities indicate that the average SEL associated with a single parking event is 71 dB SEL at distance of 50 feet. Conservatively assuming 60 patient drop-off events per hour, the resulting hourly noise level would be 53 dB L_{eq} at 50 feet.

The sensitive receptors of concern associated with patient drop-offs would be the occupants of the proposed St. Luke's Replacement Hospital and MOB Expansion Building, existing occupants of the Hartzell Building on San Jose Avenue, and residences on San Jose Avenue and 27th Street. The nearest building façade exposed to white-zone drop-offs at the St. Luke's Campus would be the MOB/Expansion Building at 25 feet. Therefore, noise levels from patient drop-offs are expected to be 56 dB L_{eq} at the façade of the proposed MOB/Expansion Building. Assuming an exterior-to-interior noise-level reduction of 30 dB associated with standard practices for concrete buildings, interior noise levels resulting from patient white-zone drop-offs are predicted to be 28 dB L_{eq} for occupants of the proposed MOB/Expansion Building. It can be assumed that the other sensitive receptors of concern would have lower interior patient drop-off noise levels because they would be farther from the white-zone drop-offs. Therefore, patient drop-off activities would not exceed interior noise levels of 45 dB, nor would such activities result in a substantial increase in ambient noise levels in the campus vicinity above existing levels. As a result, **this impact would be less than significant**.

Loading Dock and Delivery Activity

A loading dock with operable bay doors would be enclosed within the proposed St. Luke's Replacement Hospital building and would be accessed from Cesar Chavez Street. The operable bay doors are intended to be shut after arrival of a delivery truck and during normal loading-dock operations. Noise sources associated with deliveries to the replacement hospital's loading dock would include idling trucks, on-site circulation of trucks, trailer-mounted refrigeration units, back-up beepers, and the operation of forklifts. Movement of delivery trucks inside the loading dock would make the greatest contribution to noise levels. Loading-dock activities would benefit from interior-to-exterior noise reductions (conservatively assumed at -10 dB) because activities would be enclosed within the building.

Previously conducted noise monitoring at loading docks indicates that typical hourly average noise levels range from 60 to 65 dB L_{eq} and from 85 to 89 dB L_{max} at a distance of 50 feet. Accounting for the distance from the center of the loading-dock area to the campus property line and façade reductions, predicted normal noise levels at the loading dock would range from 48 to 53 dB L_{eq} and from 73 to 77dB L_{max} at the property line. As a result, operation of the loading dock would not exceed the City's noise limit of 8 dB above the ambient noise level at the property line, nor would such operation result in a substantial permanent increase in ambient noise levels in the campus vicinity above existing levels.

In addition to loading-dock noise, noise would result from delivery of bulk liquid oxygen to the existing oxygen tanks of the St. Luke's Campus. Noise related to oxygen delivery would remain the same as under existing conditions. Thus, no new stationary-source noise impacts are associated with the delivery of oxygen at the St. Luke's Campus.

Waste Disposal Activities

Waste disposal activities would occur within the loading-dock area of the proposed St. Luke's Replacement Hospital, which would contain two dumpsters. Nonmedical waste would be processed, loaded, and unloaded by standard garbage trucks, which are anticipated to produce noise levels equal to or less than (60–65 dB L_{eq} and 85–89 dB L_{max} at a distance of 50 feet) those analyzed above under "Loading Dock and Delivery Activity." The noise emissions from the garbage processing activities undertaken within the loading dock would be limited by Section 2904, "Waste Disposal Services," of the San Francisco Noise Control Ordinance to 75 dB at a distance of 50 feet from the equipment. Assuming that garbage processing noise would meet the standard of 75 dB at 50 feet, and accounting for a conservative -10 dB reduction to account for the loading-dock building's large opening to access the loading-dock area, resulting noise levels would be 65 dB at the campus property line. Measured and modeled noise levels at 50 feet from the centerline of Cesar Chavez Street are 67 dB and more than 70 dB, respectively. As a result, noise from garbage processing activities would not exceed the City's noise limit of 8 dB above the ambient noise level at the property line, nor would such activities result in a substantial increase in ambient noise levels in the campus vicinity above existing levels.

Ambulance Entrance/Exit

Noise sources associated with the proposed ambulance entrance/exit area would be from ambulances and emergency vehicles dropping off patients. It is assumed that patient drop-offs would be relatively short-term individual events and could require the use of sirens when in close proximity of the entrance to the hospital. When operated, emergency vehicle sirens could generate intermittent L_{max} noise levels up to 106 dB. With the exception of siren use, patient drop-offs were assumed to generate similar noise levels measured for parking lot events. Like parking events, patient drop-off events are expected to generate noise from vehicle arrival, idling, occupants exiting the vehicle, door closures, conversations among passengers, occupants entering the vehicle, startup, and departure of the vehicle. Therefore, a single patient drop-off was assumed to generate an average SEL noise level of 71 dB SEL at distance of 50 feet. Conservatively assuming 60 patient drop-off events per hour, the resulting hourly noise level would be 53 dB L_{eq} at 50 feet.

The proposed ambulance entrance/exit for the St. Luke's Replacement Hospital would be located along 27th Street, directly across the street from existing residential uses. Traffic noise is considered the dominant noise source in the area and modeling results indicate that traffic noise levels would be 57 dB at the campus property line. As a result, noise associated with the ambulance entrance/exit, without the use of sirens, would comply with the City's noise limit of 8 dB above the ambient noise level at the property line; however, such noise could result in a substantial increase in ambient noise levels at nearby sensitive receptors above existing levels with the frequent use of sirens.

Summary

The operation of proposed stationary sources—specifically, rooftop HVAC equipment—at the St. Luke's Campus could potentially generate noise levels that could exceed the City's noise standards and result in a substantial increase in ambient noise levels. As a result, **this impact would be significant**.

St. Luke's Campus with Project Variants: The operation of stationary mechanical-equipment noise sources at the St. Luke's Campus would not change substantially with implementation of either of the project variants for this campus. Under the Alternate Emergency Department Location Variant, the loading dock would be located adjacent to 27th Street, across from existing residential uses, and the ambulance entrance/exit would be accessed from Cesar Chavez Street, across from commercial land uses that are not noise sensitive. Loading-dock noise would result in a predicted noise level of 48–53 dB L_{eq} at the campus property line and would not expose sensitive receptors to excessive loading-dock noise. These noise-sensitive residential uses would also not be exposed to intermittent maximum siren noise under this variant. As a result, loading-dock activities along 27th Street would not exceed the City's noise limit of 8 dB above the ambient noise level at the property line, nor would they result in a substantial permanent increase in ambient noise levels in the campus vicinity above existing levels, and residential uses would not be exposed to siren noise. Therefore, ambulance entrance/exit–source noise at the St. Luke's Campus would not have the potential to affect nearby residential uses under either of the project variants for this campus. However, other noise-related effects of implementing the LRDP at the St. Luke's Campus would not change with implementation of either project variant, and rooftop HVAC equipment could still generate noise levels that could exceed the City's noise standards and result in a substantial increase in ambient noise levels. As a result, **this impact would be significant**.

Mitigation Measure for St. Luke's Campus (with or without either project variant)

M-NO-N3 This mitigation measure is identical to Mitigation Measure M-NO-N3 for the Davies Campus and Mitigation Measure M-NO-N3a for the Cathedral Hill Campus.

This mitigation measure involves implementing physical (e.g., equipment design) impact reduction measures related to stationary equipment and ambulance entrance/exit that are considered practical and feasible. Thus, the impact of the operation of stationary noise sources (i.e., mechanical HVAC equipment, emergency electrical generators) would be reduced by implementation of this mitigation measure. Thus, **implementing Mitigation Measure M-NO-N3 at the St. Luke's Campus would reduce Impact NO-3 to a less-than-significant level**.

Long-Term Projects

◆ Pacific Campus

Operation of the proposed ACC and ACC Addition, underground parking, and North-of-Clay Aboveground Parking Garage at the Pacific Campus is anticipated to introduce new stationary noise sources to the campus area. Specific details of new stationary noise sources with implementation of long-term projects at the Pacific Campus are not available at this time; however, a general discussion of anticipated stationary noise sources is provided below.

Stationary Equipment

HVAC and emergency generators may be included in the project design for the proposed ACC Addition to accommodate the need for increased air handling capacity. As discussed previously, noise levels from HVAC equipment vary substantially depending on unit efficiency, size, model type, and locations. The mechanical equipment anticipated to be used includes fans, pumps, air compressors, chillers, and cooling towers. The exact location of HVAC equipment and emergency generators has yet to be determined. HVAC equipment is typically mounted on rooftops or mechanical rooms, while emergency generators may be located on the rooftop, loading dock area, or mechanical room. The receptors of concern with respect to these noise sources would be the Marin Day School playground, residential uses south of the on-campus development site along Sacramento Street, and on-campus sensitive receptors occupying habitable rooms. The lack of detailed project information precludes a quantitative analysis of proposed new HVAC equipment at this time. It is reasonable to assume that operation of this stationary equipment could result in an exceedance of the City's noise limit of 8 dB above the ambient noise level at the property line and could result in a substantial increase in ambient noise levels in the campus vicinity above existing levels.

Parking Lot Activities

As stated in Chapter 2, "Project Description," the proposed long-term projects at the Pacific Campus would include underground parking below the proposed ACC Addition and the proposed North-of-Clay Aboveground Parking Garage. The entries and exits for the underground parking lot would be from the proposed Campus Drive and, for the North-of-Clay Aboveground Parking Garage, from Clay Street just east of Webster Street. Intermittent parking lot noise would include vehicles entering and leaving the parking garages, tires squealing, doors closing, music playing, and occasionally car alarms going off. On-campus noise sensitive receptors would not be substantially exposed to noise from the underground parking lot because these parking areas would be mostly enclosed, with openings only at the aboveground entries and exits. Vehicles entering or exiting the underground parking lot would be operating at low speeds, with noise generated intermittently. Noise from these vehicles is not anticipated to cause excessive interior noise levels at the locations of on-site receptors.

The proposed North-of-Clay Aboveground Parking Garage would be located adjacent to existing sensitive residential receptors to the north. Detailed construction plans are not available at this time; however, based on the proximity of the proposed parking garage to sensitive receptors, the potential for a noise conflict exists. As a result, parking lot noise may exceed the City's noise limit of 8 dB above the ambient noise level at the property line and may result in a substantial increase in ambient noise levels in the campus vicinity above existing levels.

Patient Drop-Offs

Noise associated with the two proposed drop-off areas (Buchanan Street and Weber Street) at the Pacific Campus would be from vehicles dropping off patients. It is assumed that patient drop-offs would be relatively short-term individual events. Reference noise-level data from previously measured parking lot events were used to quantify noise levels associated with patient drop-offs and were assumed to generate similar noise levels. Like parking, patient drop-offs are expected to generate noise from vehicle arrival, idling, occupants exiting the vehicle, door closures, conversations among passengers, occupants entering the vehicle, startup, and departure of the vehicle. Previously conducted measurements of reference noise levels for parking lot activities indicate that the average SEL associated with a single parking event is 71 dB SEL at distance of 50 feet. Conservatively assuming 60 patient drop-offs per hour, the resulting hourly noise level would be 53 dB L_{eq} at 50 feet.

The sensitive receptors of concern associated with patient drop-offs would be the occupants of the proposed 2333 Buchanan Street building (the proposed ACC) and the Pacific Professional Building (2100 Webster Street). The nearest building façade exposed to patient drop-offs at the Pacific Campus would be the Pacific Professional Building, at 25 feet. Therefore, noise levels from patient drop-offs are expected to be 56 dB L_{eq} at the façade of the Pacific Professional Building. Assuming an exterior-to-interior noise level reduction of 30 dB associated with standard practices for concrete buildings, interior noise levels resulting from patient zone drop-offs are predicted to be 28 dB L_{eq} for occupants of the Pacific Professional Building. It can be assumed that the other sensitive receptors of concern would have lower interior patient drop-off noise levels because they would be farther from the white zone drop-offs. Therefore, patient drop-off activities would not exceed interior noise levels of 45 dB, nor would such activities result in a substantial increase in ambient noise levels in the campus vicinity above existing levels. As a result, **this impact would be less than significant**.

Loading Dock and Delivery Activity

A loading dock would be enclosed within the proposed ACC Addition building and would be accessed from the proposed Campus Drive. Noise from the loading dock would not affect off-site sensitive receptors because of the orientation of the bay doors opening onto the proposed ACC Addition building and because a direct line of sight from off-site sensitive receptors to the loading dock area would be interrupted by the façade of the proposed ACC building. Therefore, this analysis will focus on the effects of loading-dock noise on interior noise levels of on-site receptors at the Pacific Campus located in the Pacific Professional Building (2100 Webster Street).

As discussed previously, noise sources associated with deliveries to the loading dock would include idling trucks, on-site circulation of trucks, trailer-mounted refrigeration units, back-up beepers, and the operation of forklifts. Movement of delivery trucks inside the loading dock would make the greatest contribution to noise levels. Loading-dock activities would benefit from interior-to-exterior noise reductions (conservatively assumed at -10 dB to account for the large opening to access the loading-dock area) because activities would be enclosed within the building.

Previously conducted noise monitoring at loading docks indicates that typical hourly average noise levels range from 60 to 65 dB L_{eq} and from 85 to 89 dB L_{max} at a distance of 50 feet. Accounting for the distance from the center of the loading-dock area to the nearest on-site building façade (70 feet) and for noise-level reductions caused by loading-dock façades, predicted normal noise levels from loading-dock operation would range from 47 to 52 dB L_{eq} and from 72 to 76 dB L_{max} at the façade of the nearest on-site building. Assuming an exterior-to-interior noise-level reduction of 30 dB associated with standard practices for concrete buildings, interior noise levels attributable to loading-dock noise are predicted to be from 17 dB to 22 dB L_{eq} and from 42 dB to 46 dB L_{max}. As a result, operation of the loading dock would not exceed an applicable standard for interior noise levels of 45 dB and would not result in a substantial permanent increase in ambient noise levels in the campus vicinity above existing levels.

Waste Disposal Activities

Waste disposal activities would occur within the loading-dock area of the proposed ACC Addition building, which would contain three Dumpsters. Nonmedical waste would be processed, loaded, and unloaded by standard garbage trucks, which are anticipated to produce noise levels (60–65 dB L_{eq} and 85–89 dB L_{max} at a distance of 50 feet) equal to or less than those analyzed above under “Loading Dock and Delivery Activity.” The noise emissions from the garbage processing activities undertaken within the loading dock would be limited by Section 2904, “Waste Disposal Services,” of the San Francisco Noise Control Ordinance to 75 dB at a distance of 50 feet from the equipment. Assuming that garbage processing noise meets the standard of 75 dB at 50 feet, and accounting for a conservative -10 dB reduction because of the loading-dock building’s intervening façade, resulting noise levels would be 65 dB at the property line. Traffic noise, from both Sacramento Street and the proposed Campus Drive, is expected to be the dominant source at the campus. Measured and modeled noise levels at 50 feet from the centerline of Sacramento Street are 65 dB and 58 dB, respectively. Traffic data for the proposed Campus Drive were not available at the time of this analysis, but this traffic is expected to contribute traffic noise to the noise environment in the immediate area of the loading dock. The loading dock would be located approximately 100 feet from the centerline of Sacramento Street. Assuming that the measured noise level at the existing Pacific Campus more accurately represents the noise environment at the campus than the modeled traffic noise level (because the measured noise level captures all noise sources currently present at the campus), waste disposal activities would not exceed 8 dB beyond the ambient noise level. As a result, noise from garbage processing activities would not exceed the City's noise limit of 8 dB above the ambient noise level at the property line, nor would they result in a substantial increase in ambient noise levels in the campus vicinity above existing levels.

Summary

The operation of proposed stationary sources at the Pacific Campus—specifically, rooftop HVAC equipment and the North-of-Clay Aboveground Parking Garage—could potentially generate noise levels that could exceed the City's noise standards and result in a substantial increase in ambient noise levels. As a result, **this impact would be significant**.

Mitigation Measure for Pacific Campus

M-NO-L3a This mitigation measure is identical to Mitigation Measure M-NO-N3 for the Davies Campus and Mitigation Measure M-NO-N3a for the Cathedral Hill Campus.

M-NO-L3b CPMC shall retain the services of a qualified acoustical consultant to conduct a site-specific acoustical analysis of the North-of-Clay Aboveground Parking Garage once detailed construction plans are available. The analysis shall address the impacts associated with the parking garage at the adjacent on-site and off-site noise-sensitive receptors. Based on the conclusions of the site-specific acoustical analysis, additional recommended noise reduction measures shall be incorporated into the design of the parking garage structure if significant impacts are anticipated.

For the same reasons as discussed for near-term projects, **implementing Mitigation Measures M-NO-L3a and M-NO-L3b at the Pacific Campus would reduce Impact NO-3 to a less-than-significant level**.

◆ Davies Campus

Long-term operation of the proposed Castro Street/14th Street MOB at the Davies Campus is anticipated to introduce new stationary noise sources to the campus area. Specific details of new stationary noise sources are not available at this time; however, a general discussion of anticipated stationary sources is provided below.

Stationary Equipment

HVAC may be included in the project design of the Castro Street/14th Street MOB to accommodate future air handling capacity needs. As discussed previously, noise levels from HVAC equipment vary substantially depending on unit efficiency, size, model type, and locations. The mechanical equipment anticipated to be used includes fans, pumps, air compressors, chillers, and cooling towers. The exact location of HVAC equipment and emergency generators for the proposed Castro Street/14th Street MOB has yet to be determined. HVAC equipment is typically mounted on rooftops or mechanical rooms, while emergency generators may be located on the rooftop, parking garage, or mechanical room. The receptors of concern with respect to these noise sources would be the residential uses along Castro Street and 14th Street and on-site receptors occupying habitable rooms of the existing Davies Hospital South Tower. The lack of detailed project information precludes a quantitative analysis of HVAC equipment or emergency generators at this time. It is reasonable to assume that operation of this stationary equipment could result in an exceedance of the City's noise limit of 8 dB above the ambient noise level at the property line and could result in a substantial increase in ambient noise levels in the campus vicinity above existing levels.

Parking Garage Activities

As stated in Chapter 2, "Project Description," the proposed Castro Street/14th Street MOB would include four levels of underground parking. The entries and exits for underground parking would be from the main entrance drive off of Castro Street and from the surface parking lot off of 14th Street. Intermittent noise from the parking area would include vehicles entering and leaving the parking garages, tires squealing, doors closing, music playing, and occasionally car alarms going off. On-campus noise sensitive receptors would not be substantially exposed to noise from the underground parking lot, because these areas would be mostly enclosed, with openings only at the aboveground entries and exits. Vehicles entering or exiting the underground parking lot would be operating at low speeds, with noise generated intermittently. Noise from these vehicles is not anticipated to cause excessive interior noise levels at the locations of on-site receptors.

Summary

The operation of proposed stationary sources—specifically, rooftop HVAC equipment—at the Davies Campus could potentially generate noise levels that could exceed the City's noise standards and result in a substantial increase in ambient noise levels. As a result, **this impact would be significant**.

Mitigation Measure for Davies Campus (long term)

M-NO-L3 This mitigation measure is identical to Mitigation Measure M-NO-N3a for the Cathedral Hill Campus.

For the same reasons as discussed for near-term projects, **implementing Mitigation Measure M-NO-L3 at the Davies Campus would reduce Impact NO-3 to a less-than-significant level**.

IMPACT NO-4 *Future traffic-related interior noise levels could exceed applicable land use compatibility standards. (Significance Criterion 6a)*

Levels of significance:

- *Cathedral Hill (with or without project variants): Less than significant with mitigation*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Implementing the CPMC LRDP could expose sensitive receptors at newly developed hospitals (e.g., patients, caretakers) and medical offices to excessive interior noise levels attributable to traffic, thereby annoying and/or disrupting the sleep of noise-sensitive receptors in these uses. The City does not provide guidance on interior noise levels to be achieved for hospitals or medical office uses, but has established noise compatibility standards for hospitals within the General Plan. In its land use compatibility standard, the City states that hospitals should generally not be developed in areas where exterior noise levels exceed 65 dB L_{dn}. When hospitals are located in areas where the exterior noise level exceeds 65 dB L_{dn}, "noise insulating features" should be incorporated (see Table 6-19, "City and County of San Francisco Land Use Compatibility Chart for Community Noise"). For the purposes of this analysis, an interior-noise-level standard of 45 dBA L_{dn} is considered appropriate and a reasonable performance standard for interior land use compatibility for hospital uses associated with the Cathedral Hill Campus.

Modeled traffic noise levels account for applied offsets, based on comparisons of measured to modeled traffic noise levels, roadway grade, truck mix percentages, surface parameters, receptor elevation, and future cumulative ADT volumes.

Near-Term Projects

◆ Cathedral Hill Campus

The habitable spaces of the proposed Cathedral Hill Hospital and Cathedral Hill MOB would be directly exposed to traffic noise from Geary Boulevard, Post Street, Franklin Street, and Cedar Street. Specific roadway segments affecting the campus are listed in Table 4.6-30, "Summary of Modeled Future Exterior Traffic Noise Levels in 2030—Cathedral Hill Campus," below. Offsets for future traffic noise modeling were assumed as follows: +1 dB for Post Street; +3 dB for Franklin Avenue, Geary Boulevard, and Van Ness Avenue; and +5 dB for Cedar Street.

Table 4.6-30
Summary of Modeled Future Exterior Traffic-Noise Levels in 2030—Cathedral Hill Campus

Roadway	Segment Location		Exterior Noise Level, dBA L_{dn} at 50 feet[1]	
	From	To	First-Floor Façade of Proposed Buildings Adjacent to Respective Roadways	Façades of Elevated Floors[2] of Proposed Buildings Adjacent to Respective Roadways
Post Street	Franklin Street	Van Ness Avenue	69	72
Geary Street	Franklin Street	Van Ness Avenue	73	76
	Polk Street	Van Ness Avenue	75	78
Franklin Street	Post Street	Geary Street	74	77
Van Ness Avenue	Post Street	Geary Street	76	79
Cedar Street	Polk Street	Van Ness Avenue	62	65

Notes:
CNEL = community noise equivalent level; dBA = A-weighted decibels; L_{dn} = day-night average noise level
1 The modeled noise levels shown assume that noise from road traffic would be the dominant long-duration noise source, as it is under the existing condition.
2 An additional +3 dBA offset applied to elevated receptors to account for the acoustic reflections from surrounding buildings.
Source: Data compiled by AECOM in 2010

The proposed concrete-building construction techniques typically provide an exterior-to-interior noise level reduction of 30 dB with windows and doors closed and all exterior openings sealed. Thus, interior noise-sensitive receptors of the proposed Cathedral Hill hospital and Cathedral Hill MOB with exposure to exterior traffic-noise levels exceeding 70 dB L_{dn} could experience interior noise levels exceeding 45-dB L_{dn}. Predicted exterior traffic noise levels would expose the façades of the proposed Cathedral Hill Hospital building to noise levels ranging from 69 dB to 79 dB L_{dn} on the first and elevated floors. Interior noise levels for sensitive receptors occupying habitable rooms of the proposed hospital are predicted to range from 39 dB to 49 dB L_{dn}. Predicted exterior traffic noise levels would expose the façades of the proposed Cathedral Hill Hospital and Cathedral Hill MOB to noise levels ranging from 62 dB to 78 dB L_{dn} on the first and elevated floors. Interior noise levels for sensitive receptors occupying habitable rooms at the proposed Cathedral Hill MOB are predicted to range from 32 dB to 48 dB L_{dn}. Therefore, future traffic noise levels would exceed an interior noise level of 45 dB L_{dn}. As a result, **this impact would be significant**.

Cathedral Hill Campus with Project Variants: Implementing the project variants for the Cathedral Hill Campus would not change impact conclusions regarding future traffic volumes or interior noise levels at the locations of on-campus receptors at the campus relative to the near-term projects as proposed. Therefore, for the same reasons as discussed above, **this impact would be significant**.

Mitigation Measure for Cathedral Hill Campus (with or without project variants)

M-NO-N4 CPMC shall obtain the services of a qualified acoustical consultant to perform a detailed interior-noise analysis and develop noise-insulating features for the habitable interior spaces of the proposed Cathedral Hill Hospital that would reduce the interior traffic-noise level inside the hospital to 45 dB L_{dn}. Interior spaces of the hospital shall be designed to include insulating features (e.g., laminated glass, acoustical insulation, and/or acoustical sealant) that would reduce interior noise levels to 45 dB L_{dn} or lower.

Interior spaces of the proposed Cathedral Hill Hospital and Cathedral Hill MOB would be required to be designed to achieve interior traffic noise levels below 45 dB L_{dn} by including noise-insulating features. Compliance with this performance standard is feasible with currently available, commonly used building technology. Therefore, **implementing Mitigation Measure M-NO-N4 at the proposed Cathedral Hill Campus would reduce Impact NO-4 to a less-than-significant level**.

◆ Davies Campus

The office and clinic spaces of the proposed Neuroscience Institute building within the Davies Campus would be directly exposed to traffic noise from Noe Street, 14th Street, and Castro Street. Specific roadway segments affecting the campus are listed in Table 4.6-31, “Summary of Modeled Future Exterior Traffic Noise Levels in 2030—Davies Campus,” below. A +1 dB offset was applied to all roadways adjacent to the Davies Campus.

The proposed concrete-building construction techniques typically provide an exterior-to-interior noise level reduction of 30 dB with windows and doors closed and all exterior openings sealed. Thus, interior noise-sensitive receptors on campus with exposure to exterior traffic-noise levels exceeding 70 dB L_{dn} could experience interior noise levels exceeding 45-dB L_{dn}. Predicted exterior traffic-noise levels would expose the façades of the proposed Neuroscience Institute building to noise levels ranging from 64 dB to 72 dB L_{dn} on the first floor and elevated floors. Interior noise levels for sensitive receptors occupying office and clinic spaces in this building are predicted to range from 34 dB to 42 dB L_{dn} on the first floor and elevated floors. Therefore, future traffic-noise levels would not exceed an interior noise level of 45 dB L_{dn}. As a result, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the near term.

◆ St. Luke’s Campus

The office, clinic, and habitable spaces of the proposed St. Luke’s Replacement Hospital and MOB/Expansion Building would be directly exposed to traffic noise from Valencia Street and Cesar Chavez Street. Specific roadway segments affecting the campus are listed in Table 4.6-32, “Summary of Modeled Future Exterior Traffic Noise Levels in 2030—St. Luke’s Campus,” below. A +2 dB offset was applied to Cesar Chavez Street.

Table 4.6-31
Summary of Modeled Future Exterior Traffic-Noise Levels in 2030—Davies Campus

Roadway	Segment Location		Exterior Noise Level, dBA L_{dn} at 50 feet[1]	
	From	To	First-Floor Façade of Proposed Buildings Adjacent to Respective Roadways	Façades of Elevated Floors[2] of Proposed Buildings Adjacent to Respective Roadways
Noe Street	14th Street	Duboce Avenue	64	67
14th Street	Castro Street	Noe Street	65	68
Castro Street	14th Street	Duboce Avenue	69	72

Notes:
CNEL = community noise equivalent level; dBA = A-weighted decibels; L_{dn} = day-night average noise level
1 The modeled noise levels shown assume that noise from road traffic would be the dominant long-duration noise source, as it is under the existing condition.
2 An additional +3 dBA offset applied to elevated receptors to account for the acoustic reflections from surrounding buildings.
Source: Data compiled by AECOM in 2010

Table 4.6-32
Summary of Modeled Future Exterior Traffic-Noise Levels in 2030—St. Luke's Campus

Roadway	Segment Location		Exterior Noise Level, dBA L_{dn} at 50 feet[1]	
	From	To	First-Floor Façade of Proposed Buildings Adjacent to Respective Roadways	Façades of Elevated Floors[2] of Proposed Buildings Adjacent to Respective Roadways
Cesar Chavez Street	Guerrero Street	Valencia Street	72	75
Valencia Street	Cesar Chavez Street	Duncan Street	66	69

Notes:
CNEL = community noise equivalent level; dBA = A-weighted decibels; L_{dn} = day-night average noise level
1 The modeled noise levels shown assume that noise from road traffic would be the dominant long-duration noise source, as it is under the existing condition.
2 An additional +3 dBA offset applied to elevated receptors to account for the acoustic reflections from surrounding buildings.
Source: Data compiled by AECOM in 2010

The proposed concrete-building construction techniques typically provide an exterior-to-interior noise level reduction of 30 dB with windows and doors closed and all exterior openings sealed. Thus, interior noise-sensitive receptors on campus with exposure to exterior traffic-noise levels exceeding 70 dB L_{dn} could experience interior noise levels exceeding 45 dB L_{dn}. Predicted exterior traffic-noise levels would expose the façades of the proposed St. Luke's Replacement Hospital and MOB/Expansion Building to noise levels ranging from 66 dB to 75 dB L_{dn} on the first floor and elevated floors. Interior noise levels for sensitive receptors occupying habitable rooms are predicted to range from 36 dB to 45 dB L_{dn} on the first floor and elevated floors. Predicted exterior traffic-noise levels would expose the façades of the proposed St. Luke's Replacement Hospital to noise levels ranging from 72 dB to 75 dB L_{dn} on the first floor and elevated floors. Interior noise levels at sensitive receptors occupying office, clinic, or habitable rooms in the proposed St. Luke's Replacement Hospital and MOB/Expansion Building are predicted to range from 42 dB to 45 dB L_{dn} on the first floor and elevated floors. Therefore, future traffic-noise levels would not exceed an interior noise level of 45 dB L_{dn}. As a result, **this impact would be less than significant**.

St. Luke's Campus with Project Variants: Implementing the project variants for St. Luke's would not change impact conclusions regarding future traffic volumes or interior noise levels at the locations of on-campus receptors at the St. Luke's Campus relative to the near-term projects as proposed. Therefore, for the same reasons as discussed above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the St. Luke's Campus in the near term.

Long-Term Projects

◆ Pacific Campus

The medical office and clinic spaces within the Pacific Campus would be directly exposed to traffic noise from Sacramento Street and Buchanan Street. Specific roadway segments affecting the campus are listed in Table 4.6-33, "Summary of Modeled Future Exterior Traffic Noise Levels in 2030—Pacific Campus." A +2 dB offset was applied to all roadways adjacent to the Pacific Campus.

Table 4.6-33
Summary of Modeled Future Exterior Traffic Noise Levels in 2030—Pacific Campus

Roadway	Segment Location		Exterior Noise Level, dBA L_{dn} at 50 feet[1]	
	From	To	First-Floor Façade of Proposed Buildings Adjacent to Respective Roadways	Façades of Elevated Floors[2] of Proposed Buildings Adjacent to Respective Roadways
Sacramento Street	Webster Street	Buchanan Street	65	68
Buchanan Street	Sacramento Street	Clay Street	66	69

Notes:
CNEL = community noise equivalent level; dBA = A-weighted decibels; L_{dn} = day-night average noise level
[1] The modeled noise levels shown assume that noise from road traffic would be the dominant long-duration noise source, as it is under the existing condition.
[2] An additional +3 dBA offset applied to elevated receptors to account for the acoustic reflections from surrounding buildings.
Source: Data compiled by AECOM in 2010

The proposed concrete-building construction techniques typically provide an exterior-to-interior noise level reduction of 30 dB with windows and doors closed and all exterior openings sealed. Thus, interior noise-sensitive receptors on campus with exposure to exterior traffic-noise levels exceeding 70 dB L_{dn} could experience interior noise levels exceeding 45-dB L_{dn}. Predicted exterior traffic-noise levels would expose the façades of the proposed

ACC building to noise levels ranging from 65 dB to 69 dB L_{dn}. Interior noise levels for sensitive receptors occupying medical office and clinic spaces are predicted to range from 35 dB to 39 dB L_{dn}. Predicted interior traffic-noise levels are predicted to be below 45 dB L_{dn}. Therefore, future traffic-noise levels would not exceed an interior noise level of 45 dB L_{dn}. As a result, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific Campus in the long term.

◆ Davies Campus

Predicted exterior traffic-noise levels associated with long-term projects under the LRDP would expose the façades of the proposed Castro Street/14th Street MOB to noise levels ranging from 65 dB to 72 dB L_{dn} on the first floor and elevated floors, respectively. Interior noise levels for sensitive receptors occupying habitable rooms are predicted to range from 35 dB to 42 dB L_{dn}. This long-term impact is identical to the near-term impact for the Davies Campus, identified above. For the same reasons as discussed above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the long term.

IMPACT NO-5

Groundborne vibration levels attributable to construction activities could exceed the threshold of significance for exposing noise- and vibration-sensitive land uses to vibration levels that exceed applicable thresholds. (Significance Criterion 6b)

Levels of significance:

- *Cathedral Hill (with or without project variants): Significant and unavoidable with mitigation*
- *Pacific: Significant and unavoidable with mitigation*
- *Davies (near term and long term): Significant and unavoidable with mitigation*
- *St. Luke's (with or without either project variant): Significant and unavoidable with mitigation*

No near- or long-term project-related operational sources of vibration would be created or modified by implementation of the CPMC LRDP. Vibration-sensitive equipment and sources of vibration used for CPMC operations would be in controlled environments, designed by acoustical and vibration consultants under contract with CPMC to comply with applicable vibration standards for on-site sensitive receptors occupying proposed buildings. This would also result in compliance with recommended vibration standards (outlined below) at off-site sensitive receptors adjacent to proposed LRDP structures. No exterior sources of vibration would be expected to affect sensitive receptors within existing, renovated, or new facilities on the CPMC campuses covered by this EIR. Thus, nonconstruction-related sources of vibration are not discussed further in this analysis.

Construction activities for projects under the LRDP would include vibration-producing construction activities (e.g., demolition, excavation, grading, basement excavation, and clearing). No pile driving or rock blasting is anticipated to occur. Individual CPMC campus construction phasing is proposed.

Groundborne vibration levels caused by various types of construction equipment are summarized in Table 4.6-34, “Representative Vibration Source Levels for Construction Equipment” (page 4.6-91). The representative vibration levels identified for various construction equipment types show that sensitive receptors located within 25 feet of construction activities would be exposed to groundborne vibration levels that exceed acceptable thresholds of significance. Thresholds for annoyance caused by construction vibration activities at varying land use types and existing structures are as follows:

- 65 VdB for land uses where low ambient vibration is essential for interior operations (e.g., hospitals, high-tech manufacturing, laboratory facilities);
- 72–80 VdB for residential uses and buildings where people normally sleep; and
- 75–83 VdB for institutional land uses with primarily daytime operations (e.g., schools, churches, clinics, offices).

Thresholds for damage to structures caused by construction vibration activities at varying land use types and existing structures are as follows:

- Caltrans recommends a limit of 0.5 in/sec PPV for new residential buildings to protect buildings from groundborne vibration, and
- Caltrans recommends a limit of 0.25 in/sec PPV for older or historically significant buildings.[55]

◆ Cathedral Hill, Davies, and St. Luke’s Campuses

Depending on the specific construction equipment used and operations involved, near-term demolition and construction activities at the site of the proposed Cathedral Hill Campus and at the Davies and St. Luke’s Campuses may temporarily increase ground vibration. It is anticipated that the highest construction-related groundborne noise and vibration levels would be generated during the demolition phases for the Cathedral Hill and Davies Campuses (9 months and 3 months, respectively), and during the 8-month utilities realignment phase and 5-month demolition phase at St. Luke’s, because equipment used for demolition generates the highest ground vibration levels of the equipment typically used on construction sites.

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[55] California Department of Transportation. 2004. *Transportation and Construction-Induced Vibration Guidance Manual*. Sacramento, CA. Table 19. Page 27.

Table 4.6-34
Representative Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 feet (in/sec)[1]	Approximate L_v (VdB) at 25 feet[2]
Vibratory roller	0.210	94
Large bulldozer	0.089	87
Hoe Ram	0.089	87
Caisson drilling	0.089	87
Trucks	0.076	86
Concrete breaker	0.059	83
Jackhammer	0.035	79
Small bulldozer	0.003	58

Notes:
in/sec = inches per second; VdB = vibration decibels
1 Where PPV is the peak particle velocity
2 Where L_v is the root mean square velocity expressed in vibration decibels (VdB), assuming a crest factor of 4.
Source: Federal Transit Administration. 2006 (May). *Transit Noise and Vibration Impact Assessment.* Washington, DC. Page 12-2.

To evaluate vibration impacts at sensitive receptors near each campus, the use of the construction equipment generating the highest PPV and VdB levels (vibratory roller or hoe ram) was analyzed. The distances of construction equipment to the locations of sensitive receptors in the respective construction areas for the Cathedral Hill, Davies, and St. Luke’s Campuses are shown in Table 4.6-35, “Modeled Vibration Levels Resulting from Near-Term LRDP-Related On-Site Campus Demolition Activities—Cathedral Hill, Davies, and St. Luke’s Campuses” (page 4.6-92). Predicted groundborne noise and vibration levels at the Cathedral Hill, Davies, and St. Luke’s Campuses would be as follows:

- **Cathedral Hill Campus:** Ranging from 69 to 88 VdB, and up to 0.104 in/sec PPV
- **Davies Campus:** Ranging from 58 to 79 VdB, and up to 0.037 in/sec PPV
- **St. Luke’s Campus:** Ranging from 59 to 84 VdB, and up to 0.064 in/sec PPV

As a result, for each of these campuses, attenuated vibration-inducing construction activities at off-site locations would not exceed Caltrans’s threshold for building damage of 0.25 in/sec PPV. However, depending on the individual land use type, predicted levels of groundborne noise and vibration may exceed FTA’s standard for human response (i.e., annoyance as listed above on page 4.6-92) at nearby off-site vibration-sensitive uses. Therefore, **this impact would be significant**.

Table 4.6-35
Modeled Vibration Levels Resulting from Near-Term LRDP-Related On-Campus Demolition Activities—Cathedral Hill, Davies, and St. Luke's Campuses

Location	Distance (feet)[1]	PPV (in/sec)	Approximate L_v (VdB)[2]	Exceeds Threshold?	
				Building Damage	Human Annoyance[3]
Cathedral Hill Campus					
Geary Boulevard residences	80	0.037	79	No	No
Hamilton Square Baptist Church	70	0.045	81	No	Yes
1 Daniel Burnham Court	90	0.031	78	No	No
1142 Van Ness Avenue—Concordia Club	40	0.104	88	No	Yes
1001 Polk Street—Episcopal Services	65	0.050	82	No	Yes
990 Geary Street—Rex Arms Apartments	140	0.016	72	No	No
990 Polk Street—senior apartments	180	0.011	69	No	No
The Opal SF Hotel—1050 Van Ness Avenue	80	0.037	79	No	No
Super 8 Hotel—1015 Geary Street	80	0.037	79	No	No
First Unitarian Church—1187 Franklin Street	170	0.012	69	No	No
Davies Campus					
On-site sensitive receptors (North Tower)	80	0.037	79	No	Yes
On-site sensitive receptors (South Tower)	115	0.021	75	No	Yes
900 block of 14th Street residences	410	0.003	58	No	No
000 block of Noe Street residences	110	0.023	75	No	No
700 block of Duboce Avenue residences	335	0.004	61	No	No
ST. Luke's Campus					
On-site sensitive receptors (patients, staff)	160	0.013	70	No	No
1450–1600 blocks of Guerrero Street	55	0.064	84	No	Yes
3400–3700 blocks of Cesar Chavez Street	165	0.012	70	No	No
1600–1700 blocks of Duncan Street	370	0.004	59	No	No
578–643 blocks of San Jose Avenue	100	0.026	76	No	No
000–100 blocks of 27th Street	115	0.021	75	No	No

Notes:
in/sec = inches per second; PPV = peak particle velocity; VdB = vibration decibels
[1] Measured from sensitive receptor property line to assumed location for equipment operation, 50 feet within construction sites ± 10 feet.
[2] Where L_v is the root mean square velocity expressed in VdB, assuming a crest factor of 4.
[3] Thresholds recommended for human annoyance and structural damage by the Federal Highway Administration and California Department of Transportation.
Source: Data compiled by AECOM in 2010

Cathedral Hill Campus and St. Luke's Campus with Project Variants: The project variants for the proposed Cathedral Hill Campus (No Van Ness Avenue Pedestrian Tunnel Variant, Two-Way Post Street Variant, and MOB Access Variant) and the variants for the St. Luke's Campus (Alternate Emergency Department Location Variant and Cesar Chavez Street Utility Line Variant) would not locate construction-related or operational vibration sources closer to noise- or vibration-sensitive receptors for either campus. Therefore, the overall effect of temporary, project-generated construction vibration would not change at either campus. For the same reasons as discussed above, **this impact would be significant**.

Mitigation Measure for Cathedral Hill, Davies (near term), and St. Luke's Campus (with or without project variants)

M-NO-N5 CPMC shall minimize the impacts of construction noise and vibration where feasible by implementing the measures listed below. These measures shall be required in each contract agreed to between CPMC and a contractor under the LRDP and shall apply to all projects and programs covered by this EIR.

- Construction equipment generating the highest noise and vibration levels (vibratory rollers) shall operate at the maximum distance feasible from sensitive receptors.
- Vibratory rollers shall operate during the daytime hours only to ensure that sleep is not disrupted at sensitive receptors near the construction area.
- A community liaison shall be available to respond to vibration complaints from nearby sensitive receptors. A community liaison shall be designated. Contact information for the community liaison shall be posted in a conspicuous location so that it is clearly visible to the nearby receptors most likely to be disturbed. The community liaison shall manage complaints resulting from construction vibration. Reoccurring disturbances shall be evaluated by a qualified acoustical consultant to ensure compliance with applicable standards. The community liaison shall contact nearby noise-sensitive receptors and shall advise them of the construction schedule.
- To further address the nuisance impact of project construction, a construction vibration management plan shall be prepared by a qualified acoustical consultant retained by CPMC. The vibration management plan shall include but shall not be limited to the following tasks:
  - A community liaison shall be designated. This person's contact information shall be posted in a location near the project site that it is clearly visible to the nearby receptors most likely to be disturbed. The community liaison shall manage complaints and concerns resulting from activities that cause vibration. The severity of the vibration concern shall be assessed by the community liaison and, if necessary, evaluated by a qualified noise and vibration control consultant.
  - The preexisting condition of all buildings within a 50-foot radius and historical buildings within the immediate vicinity of proposed construction activities shall be recorded in the form of a preconstruction survey. The preconstruction survey shall determine conditions that exist before construction begins and shall be used to evaluate damage caused by construction activities. Fixtures and finishes within a 50-foot radius of construction activities susceptible to damage shall

be documented (photographically and in writing) before construction. All buildings damaged shall be repaired to their preexisting conditions.

This mitigation measure involves implementing both physical (e.g., distance) and operational (e.g., daytime operations) impact reduction measures that are considered practical and feasible. Construction-related groundborne vibration would be reduced by implementation of this mitigation measure, but excessive vibration at sensitive receptors would still occur. **Implementing Mitigation Measure M-NO-N5 at the proposed Cathedral Hill Campus and at the Davies and St. Luke's Campuses would reduce Impact NO-5, but not to a less-than-significant level; therefore, this impact would remain significant and unavoidable**.

Long-Term Projects

◆ Pacific and Davies Campuses

On- and off-site vibration-sensitive receptors are located near proposed long-term campus construction areas under the LRDP. At the Pacific Campus, the nearest sensitive receptors to on-site construction activity are the Smith Kettlewell Eye Research Institute building, located immediately north of the existing Gerbode Research Building (2200 Webster Street) at the northwestern corner of the campus; the Stern Building (2330 Clay Street); the Mental Health Center (2323 Sacramento Street); the Health Services Library (2395 Sacramento Street); and residential uses. The nearest off-site residential sensitive receptors are the multifamily residential units along the south side of Washington Street between Webster Street and Buchanan Street, adjacent to and north of the campus; and multifamily residential uses along Sacramento Street, adjacent to and south of the proposed construction area.

At the Davies Campus, the existing 290-space garage at 14th and Castro Streets would be demolished and the proposed Castro Street/14th Street MOB would be constructed on the parking garage site by 2020 to meet the future need for medical office space. The construction phasing for long-term projects at the Davies Campus is not available at this time, but construction operations are expected to be similar to the campus's near-term vibration-generating operations (demolition, clearing, grading, and excavation). Construction-related vibration levels and exposure of sensitive receptors under LRDP long-term projects at the Davies Campus would be similar to those for proposed near-term development at this campus.

To evaluate vibration impacts at sensitive receptors near each campus, the use of the construction equipment generating the highest PPV and VdB levels (vibratory roller) was analyzed (see Table 4.6-34, "Representative Vibration Source Levels for Construction Equipment" [page 4.6-91]). The distances of this vibration-generating construction equipment to locations of sensitive receptors near the construction area for the Pacific Campus are shown in Table 4.6-36, "Modeled Vibration Levels Resulting from LRDP-Related On-Campus Demolition

Activities—Pacific Campus," below. Distances of this vibration-generating construction equipment to the locations of sensitive receptors near the Davies Campus construction area are shown above in Table 4.6-36 (page 4.6-95).

Table 4.6-36
Modeled Vibration Levels Resulting from LRDP-Related On-Campus Demolition Activities—Pacific Campus

Location	Distance (feet)	PPV (in/sec)	Approximate L_v (VdB)[1]	Exceeds Threshold?	
				Building Damage	Human Annoyance
On-site receptors	50	0.074	85	No	Yes
Stern Building (2330 Clay Street)	35	0.127	90	No	Yes
Smith Kettlewell Eye Research Institute	25	0.210	94	No	Yes
Mental Health Center (2323 Sacramento Street)	75	0.040	80	No	Yes
Health Services Library (2395 Sacramento Street)	95	0.028	77	No	Yes
Washington Street multifamily residences	25	0.210	94	No	Yes
2300 block Sacramento Street residences	75	0.040	80	No	No

Notes:
in/sec = inches per second; PPV = peak particle velocity; VdB = vibration decibels
[1] Where L_v is the root mean square velocity expressed in VdB, assuming a crest factor of 4.
Source: Data compiled by AECOM in 2010

Predicted groundborne noise and vibration levels would range from 77 to 94 VdB, and up to 0.210 in/sec PPV, at the Pacific Campus and would range from 58 to 79 VdB, and up to 0.037 in/sec PPV, at the Davies Campus. As a result, for both campuses, attenuated vibration-inducing construction activities at the locations of on-site and off-site sensitive receptors would not exceed Caltrans's building damage threshold of 0.25 in/sec PPV. However, predicted groundborne noise and vibration levels would exceed FTA's standard for human response (i.e., annoyance) at nearby on-site and off-site vibration-sensitive uses. Therefore, **this impact would be significant**.

Mitigation Measure for Pacific Campus and Davies Campus (long term)

M-NO-L5 This mitigation measure is identical to Mitigation Measure M-NO-N5 for the Cathedral Hill Campus.

Implementing Mitigation Measure M-NO-L5 at the Pacific and Davies Campuses would reduce Impact NO-5, but not to a less-than-significant level; therefore, **this impact would remain significant and unavoidable.**

4.6.6 CUMULATIVE IMPACTS

Other projects would be expected to occur in or near the vicinity of the existing and proposed CPMC campuses. Cumulative projects within the campus vicinity (defined to be within a two-block radius of the campus) that are proposed or are reasonably foreseeable are listed in Section 4.1.3, “Cumulative Conditions,” beginning on page 4.1-35 in Section 4.1, “Land Use and Planning.” These potential future projects in the vicinity of the CPMC campuses involve constructing new structures and renovating and expanding existing uses. Individual cumulative noise impacts are discussed separately below.

SHORT-TERM EXPOSURE OF SENSITIVE RECEPTORS TO INCREASED CONSTRUCTION NOISE AND VIBRATION

Construction activities at the CPMC campuses associated with the near-term and long-term projects under the LRDP could occur at the same time as construction activities generated by one or more of the proposed cumulative projects listed in Section 4.1.3 of this EIR. Only the proposed Cathedral Hill Campus and existing St. Luke’s Campus, however, are anticipated to be substantially affected by cumulative construction impacts of other projects. Specifically, the Van Ness Corridor Bus Rapid Transit project, the Geary Corridor Bus Rapid Transit project, the proposed 30-story residential tower at 1333 Gough Street, and the proposed 13-story mixed-use project at 1285 Sutter Street are near (within two city blocks of) the site of the proposed Cathedral Hill Campus, and the proposed four-story mixed-use project at 3400 Cesar Chavez Street is near the St. Luke’s Campus. Thus, noise or vibration from construction of other proposed projects could combine or overlap with the noise or vibration from construction at the Cathedral Hill Campus or St. Luke’s Campus, producing a substantial temporary increase in noise levels and/or exceeding applicable thresholds at nearby noise- and vibration-sensitive receptors.

Noise and vibration generated by daytime construction is considered exempt from the San Francisco Noise Control Ordinance; however, there is no guarantee that construction of the other proposed cumulative projects or near-term construction at the proposed Cathedral Hill Campus would be restricted to daytime hours. Similarly, there is no guarantee that the construction noise and vibration mitigation measures (e.g., those described in Mitigation Measures M-NO-N1 and M-NO-N5) for the LRDP would be applied to the cumulative projects. The proposed cumulative projects near the Cathedral Hill and St. Luke’s Campuses are shielded by intervening buildings, with limited direct lines of sight to the campus sites; thus, construction noise is expected to remain contained at each construction site. Furthermore, existing ambient noise levels in the areas of both campuses are dominated by high levels of traffic noise. Thus, the construction noise impacts generated by cumulative projects are temporary, albeit for sometimes long periods of time, and are not anticipated to be significant; thus, the contribution of the LRDP to this cumulative impact would not be cumulatively considerable. Therefore, **cumulative impacts related to construction noise would be less than significant**.

LONG-TERM EXPOSURE OF SENSITIVE RECEPTORS TO INCREASED TRAFFIC NOISE LEVELS

The modeled results presented in the analysis for Impact NO-2 (beginning on page 4.6-57) shows that for all but one roadway under long-term (2030) cumulative conditions, traffic noise from roadway segments near the CPMC campuses would not expose noise-sensitive receptors to a substantial increase in noise, relative to future 2030 baseline traffic-noise levels. For the Cathedral Hill Campus, the roadway segment for Cedar Street between Van Ness Avenue and Polk Street, adjacent to the site of the proposed Cathedral Hill MOB, would experience a substantial increase (+3 dB) as a result of the near-term development. The cumulative LRDP contribution to future daily traffic volumes is considered nominal and would not result in significant traffic-noise impacts, as described in Impact NO-2 (page 4.6-57).

The proposed Van Ness Corridor Bus Rapid Transit project and the Geary Corridor Bus Rapid Transit project would increase the number of buses and frequency of bus traffic along Van Ness Avenue and Geary Boulevard, and as a result would increase traffic-related noise at the site of the proposed Cathedral Hill Campus. However, based on existing and future traffic volumes and the size of cumulative projects, other projects proposed in the area are not expected to result in substantial increases in average daily traffic volumes, compared to future (2030) baseline daily traffic volumes. Therefore, the cumulative impact of the aforementioned cumulative projects would be less than significant. As a result, the impact of the LRDP on exposure of noise-sensitive receptors near the CPMC campuses to traffic noise would not be cumulatively considerable. Therefore, **cumulative impacts related to traffic noise would be less than significant**.

LONG-TERM EXPOSURE OF SENSITIVE RECEPTORS TO INCREASED STATIONARY-SOURCE NOISE

Noise generated by stationary noise sources associated with cumulative projects could exceed applicable standards or could cause a substantial increase in the noise environment at nearby noise-sensitive receptors, or both. Thus, the aforementioned cumulative projects could generate significant stationary-source noise impacts.

Based on the analysis for Impact NO-3 (beginning on page 4.6-64), noise from the HVAC equipment and emergency generators at the CPMC campuses is not expected to combine with noise produced by one or more of the cumulative projects near the campuses. Proposed cumulative projects are not located adjacent to any of the projects proposed under the LRDP at CPMC campuses, and all cumulative projects are expected to comply with the San Francisco Noise Control Ordinance. Furthermore, implementing Mitigation Measure M-NO-3 (page 4.6-64) would reduce noise levels produced by the stationary noise sources at the CPMC campuses to levels that comply with applicable standards, and would ensure that the LRDP projects on various campuses would not cause substantial increases in the ambient noise environment at noise-sensitive receptors. Therefore, noise emissions from stationary sources associated with the LRDP are not expected to combine with noise from stationary noise sources associated with cumulative projects to cause a substantial increase in the noise environment at any noise-sensitive receptor. As a result, the LRDP's incremental contribution to this cumulative impact would not be cumulatively considerable. Therefore, **cumulative impacts related to stationary-source noise would be less than significant**.

COMPATIBILITY OF SENSITIVE LAND USES WITH THE AMBIENT NOISE ENVIRONMENT

The long-term noise environment at the CPMC campus sites could be influenced by stationary-source noise and traffic noise generated by cumulative projects. Noise sources in the vicinity of the CPMC campuses could include personal, public-transportation, and commercial vehicles; activity at loading docks; people talking; operation of exterior mechanical equipment; and other miscellaneous neighborhood noise. Based on field observations, noise from road traffic dominates the noise environment at the campus sites, and it is anticipated that this would continue to be the case in the future. Stationary-source noise and traffic noise in the vicinity of CPMC campuses could increase with implementation of cumulative projects.

As discussed under Impact NO-3, "Long-Term Exposure of Sensitive Receptors to Increased Stationary-Source Noise" (beginning on page 4.6-64), the cumulative projects near the CPMC campuses would be required to comply with applicable noise limits established by the City for stationary-source noise. With the implementation of Mitigation Measure M-NO-3 on all CPMC campuses, cumulative impacts related to stationary sources would be reduced to a less-than-significant level. Because the other cumulative projects proposed in the vicinity of each CPMC campus are not adjacent to any of the developments proposed under the LRDP at any of the campuses, a cumulative impact related to stationary-source noise would not occur.

As discussed under Impact NO-2, "Long-Term Exposure of Sensitive Receptors to Increased Traffic Noise Levels" (beginning on page 4.6-57), the noise-sensitive receptors near or on the CPMC campuses would not be exposed to a substantial increase in traffic noise levels relative to the existing ambient noise level, except sensitive receptors located along Cedar Street between Van Ness Avenue and Polk Street. Sensitive receptors along Cedar Street are currently exposed to traffic noise levels exceeding 60 dB because of traffic noise along Van Ness Avenue and Polk Street. A substantial increase in traffic volumes would typically result in a substantial increase in traffic noise. However, when the future (2030) cumulative traffic noise levels are compared to existing measured ambient noise levels along Cedar Street, the cumulative traffic noise would not result in a substantial increase to those ambient noise levels. The proposed cumulative projects could increase traffic volumes on the roadway segments that surround the campuses, but not cumulatively considerable. Thus, the traffic-noise impacts from implementing the proposed cumulative projects on land uses near the CPMC campuses would not be considered cumulatively significant.

Implementing Mitigation Measure M-NO-N4 (page 4.6-86) would require that noise insulation features be included in proposed building designs under the LRDP to ensure compliance with applicable standards for interior noise levels for on-campus sensitive receptors.

As a result, the LRDP's incremental contribution to this potentially significant cumulative impact would not be cumulatively considerable. Therefore, **cumulative impacts related to land use compatibility would be less than significant**.

COMPATIBILITY OF SENSITIVE LAND USES WITH THE LONG-TERM GROUNDBORNE NOISE AND VIBRATION ENVIRONMENT

Cumulative projects are not anticipated to include development or uses that would generate vibration or groundborne noise at levels that exceed applicable standards because the LRDP would not include excessive vibration-generating components. The cumulative projects in the areas of the CPMC campuses are either residential or mixed-use projects. Typically, these project types would not introduce substantial long-term groundborne vibration to their vicinity. Therefore, the impact of cumulative projects would not be significant, and the contribution of the LRDP to this impact would not be cumulatively considerable. As a result, **cumulative impacts related to sources of long-term groundborne vibration would be less than significant**.

SHORT-TERM EXPOSURE OF SENSITIVE RECEPTORS TO GROUNDBORNE NOISE AND VIBRATION

Levels of groundborne noise and vibration from construction of cumulative projects could be similar to or greater than those discussed for the LRDP in Impact NO-5 (beginning on page 4.6-89). Specifically, depending on the construction equipment used and activities occurring, construction activities would result in varying degrees of temporary groundborne noise and vibration. As shown in Table 4.6-35, "Modeled Vibration Levels Resulting from Project-Related On-Site Demolition Activities—Cathedral Hill, Davies, and St. Luke's Campuses" (page 4.6-92) and Table 4.6-36, "Modeled Vibration Levels Resulting from Project-Related On-Site Demolition Activities—Pacific Campus" (page 4.6-95), impacts associated with human annoyance or sleep disturbance because of vibration-related construction activities are expected. The duration of vibration-related construction activities that would cause human annoyance or sleep disruption for sensitive receptors is not anticipated to be prolonged, nor are such construction activities anticipated to occur during nighttime hours. Mitigation Measure M-NO-N5 would reduce the potential for human annoyance at sensitive receptors related to vibration-related construction activities; however, this impact would remain significant and unavoidable for all CPMC campuses and surrounding areas under the LRDP.

Although detailed information is not currently available, maximum levels of groundborne noise and vibration associated with construction of the LRDP development projects, in combination with other cumulative projects, would result from the use of bulldozers. According to FTA, levels associated with the use of a large bulldozer are

0.089 in/sec PPV (87 VdB) at 25 feet. With respect to the prevention of structural damage, the use of bulldozers would not cause vibration exceeding the Caltrans-recommended level of 0.25 to 0.5 in/sec PPV at distances greater than of 25 feet. However, with respect to preventing human annoyance or sleep disturbance, vibration caused by the use of bulldozers could exceed the FTA-recommended level of 80 VdB within 50 feet. Cumulative development projects would not occur within 50 feet of the CPMC campuses because of their distance from these campuses; therefore, they would not combine to result in excessive groundborne noise and vibration for on- or off-site sensitive receptors. Thus, the cumulative impact would not be significant. As a result, the LRDP would also not make a cumulatively considerable contribution to this impact. Therefore, **cumulative impacts related to sources of short-term groundborne vibration would be less than significant**.

4.7 AIR QUALITY

This section provides an overview of the existing air quality conditions, a summary of 1999 (“applicable”) and recently adopted regulations (2010), and an analysis of the potential short-term and long-term air quality impacts associated with implementation of the CPMC *Long Range Development Plan* (LRDP). The methods of emissions analysis for short-term construction, long-term operations, local mobile sources, odors, and toxic air contaminants (TACs) are consistent with the current recommendations of the Bay Area Air Quality Management District (BAAQMD) and the California Air Resources Board (ARB). Mitigation measures are recommended, as necessary, to reduce significant air quality impacts.

4.7.1 ENVIRONMENTAL SETTING

The project site is located in the city and county of San Francisco, which is within the San Francisco Bay Area Air Basin (SFBAAB). The SFBAAB also includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties, the southern portion of Sonoma County, and the southwest portion of Solano County. Ambient concentrations of air pollutant emissions are determined by the amount of emissions released by pollutant sources and the atmosphere’s ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight. Existing air quality conditions in the project area are determined by such natural factors as topography, meteorology, and climate in addition to the amount of emissions that the sources of existing air pollutants release. The environmental factors and pollutant sources that affect ambient air pollutant concentrations are discussed separately.

TOPOGRAPHY, METEOROLOGY, AND CLIMATE

The SFBAAB covers approximately 5,540 square miles of complex terrain consisting of coastal mountain ranges, inland valleys, and the San Francisco Bay. The SFBAAB is generally bounded on the west by the Pacific Ocean, on the north by the Coast Ranges, and on the east and south by the Diablo Range.

The climate is dominated by a strong, semipermanent, subtropical high-pressure cell over the northeastern Pacific Ocean. Climate is also affected by the moderating effects of the adjacent oceanic heat reservoir. Mild summers and winters, moderate rainfall and humidity, and daytime onshore breezes characterize regional climatic conditions in the San Francisco Bay Area (Bay Area). In summer, when the high-pressure cell is strongest and farthest north, fog forms in the morning and temperatures are mild. In winter, when the high-pressure cell is weakest and farthest south, occasional rainstorms occur.

Regional wind flow patterns affect air quality patterns by directing pollutants downwind of sources. Localized meteorological conditions, such as moderate winds, disperse pollutants and reduce pollutant concentrations. When a warm layer of air traps cooler air close to the ground, an inversion is produced that traps air pollutants near the ground. Inversions occur in the CPMC LRDP project area during summer mornings and afternoons. During summer's long daylight hours, plentiful sunshine fuels photochemical reactions between oxides of nitrogen (NO_X) and reactive organic gases (ROGs) that result in ozone formation. Often in summer, as the Central Valley heats up, the cooler marine layer is drawn into San Francisco in late morning and in the afternoon. As a result, pollutants are transported away from the city as fog forms.

In the winter, temperature inversions dominate during the night and early morning hours but frequently dissipate by afternoon. At night during the winter, higher localized pollutant concentrations can occur, such as from carbon monoxide (CO), nitrogen dioxide (NO_2), respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less (PM_{10}), and fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less ($PM_{2.5}$). High CO concentrations occur on winter days with strong surface inversions and light winds, which result in extremely limited CO transport.

The local meteorology of the CPMC LRDP project area is represented by measurements recorded at the San Francisco Airport station. The normal annual precipitation, which occurs primarily from November through March, is approximately 20 inches. Normal January temperatures range from a minimum of 42 degrees Fahrenheit (°F) to a maximum of 56°F, and September temperatures range from a minimum of 55°F to a maximum of 74°F.[1] The predominant wind direction and speed, measured at the San Francisco Airport station, is from the northwest at approximately 7 miles per hour (mph).[2]

CRITERIA AIR POLLUTANTS

ARB and the U.S. Environmental Protection Agency (EPA) focus on the following air pollutants as indicators of ambient air quality: ozone, CO, NO_2, sulfur dioxide (SO_2), PM_{10}, $PM_{2.5}$, and lead. Because these are the most prevalent air pollutants known to be deleterious to human health, and extensive health-effects criteria documentation is available for these pollutants, they are commonly referred to as "criteria air pollutants." Health-based air quality standards have been established for these pollutants by ARB at the state level and by EPA at the national level. These standards, which include a margin of safety, were established to protect the public from adverse health impacts resulting from exposure to air pollution. California has also established standards for sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. A brief description of each criteria air pollutant, including source types, health effects, and future trends, is provided below along with the most current monitoring station data and attainment designations for the project area. Table 4.7-1, "California and National

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1 National Oceanic and Atmospheric Administration. 1992. *Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days 1961–1990.* Asheville, NC.

2 California Air Resources Board. 1994 (June). *California Surface Wind Climatology.* Sacramento, CA.

Table 4.7-1
California and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[2, 3]	National Standards[1]	
			Primary[3, 4]	Secondary[3, 5]
Ozone	1-hour	0.09 ppm (180 µg/m^3)	–	–
	8-hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	Same as Primary Standard
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	–
	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	
Nitrogen Dioxide (NO_2)[6]	Annual Arithmetic Mean	0.030 ppm (56 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary Standard
	1-hour	0.18 ppm (338 µg/m^3)	0.100 ppm	–
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	0.030 ppm (80 µg/m^3)	–
	24-hour	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	–
	3-hour	–	–	0.5 ppm (1,300 µg/m^3)
	1-hour	0.25 ppm (655 µg/m^3)	–	–
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	-	Same as Primary Standard
	24-hour	50 µg/m^3	150 µg/m^3	
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	15.0 µg/m^3	Same as Primary Standard
	24-hour	–	35 µg/m^3	
Lead[7]	30-day Average	1.5 µg/m^3	–	–
	Calendar Quarter	–	1.5 µg/m^3	Same as Primary Standard
Sulfates	24-hour	25 µg/m^3	No National Standards	
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m^3)		
Vinyl Chloride[7]	24-hour	0.01 ppm (26 µg/m^3)		
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer—visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%		

Notes: $\mu g/m^3$ = micrograms per cubic meter; ppm = parts per million; mg/m^3 = milligrams per cubic meter

[1] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the U.S. Environmental Protection Agency for further clarification and current federal policies.

[2] California standards for ozone, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[3] Concentration expressed first in units in which it was issued (i.e., ppm or $\mu g/m^3$). Equivalent units given in parentheses are based on a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[5] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[6] On February 19, 2008, the Office of Administrative Law approved a new NO_2 ambient air quality standard that lowers the 1-hour standard to 0.18 ppm and establishes a new annual standard of 0.030 ppm. These changes became effective March 20, 2008.

[7] The California Air Resources Board has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Source: California Air Resources Board. 2010. State and National Ambient Air Quality Standards. Available: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. As of February 16, 2010. Accessed June 18, 2010.

Ambient Air Quality Standards" (page 4.7-3), presents the California Ambient Air Quality Standards (CAAQS) and the National Ambient Air Quality Standards (NAAQS).

Ozone

Ozone is a photochemical oxidant, a substance whose oxygen combines chemically with other substances in the presence of sunlight, and is the primary component of smog. Ozone is not directly emitted into the air, but is formed through complex chemical reactions between precursor emissions of ROG and NO_X in the presence of sunlight. ROGs are volatile organic compounds (VOCs) that are photochemically reactive. ROG emissions result primarily from incomplete combustion and the evaporation of chemical solvents and fuels. NO_X refers to a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels. A highly reactive molecule, ozone readily combines with many different components of the atmosphere. Consequently, high levels of ozone tend to exist only while high ROG and NO_X levels are present to sustain the ozone formation process. Once the precursors have been depleted, ozone levels rapidly decline. These reactions occur on a regional scale; therefore, ozone is a regional pollutant.

Ozone located in the upper atmosphere (stratosphere) acts in a beneficial manner by shielding Earth from harmful ultraviolet radiation emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds or stagnant air coupled with warm temperatures and clear skies provide the optimum conditions for ozone formation. As a result, summer is generally the peak ozone season. Peak ozone concentrations often occur far downwind of the precursor emissions because of the reaction time involved. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry.[3]

The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as asthmatics and children, but healthy adults as well. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 parts per million (ppm) for 1 to 2 hours has been found to significantly alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing "tidal" volumes (the amount of air inhaled and exhaled), and impairing respiratory mechanics. Ambient levels of ozone above 0.12 ppm are linked to symptomatic responses, such as throat dryness, chest tightness, headache, and nausea. In addition to the above adverse health effects, evidence also exists relating ozone exposure to an increase in permeability of respiratory epithelia; such increased permeability leads to an increased response of the respiratory system to challenges and a decrease in the immune system's ability to defend against infection.[4]

Emissions of ozone precursors ROG and NO_X have decreased over the past several years as a result of more stringent motor vehicle emissions standards and cleaner burning fuels. Consequently, peak 1-hour and 8-hour ozone concentrations in the SFBAAB have declined approximately 17% and 18%, respectively, in the past 20 years (1988–2007).[5] However, it is not clear if this reduction represents a significant change in the overall trend because of the variability caused by meteorological conditions in the SFBAAB.[6]

Carbon Monoxide

CO is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56% of all CO emissions nationwide. Other nonroad engines and vehicles (such as construction equipment and boats) contribute about 22% of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion. In cities, 85 to 95% of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are sources of CO indoors. The highest levels of CO in the outside air typically occur during the colder months of the year when

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3 Godish, T. 2004. *Air Quality*. New York, NY: Lewis Publishers. Pages 51–55.

4 Ibid. Pages 169–170.

5 California Air Resources Board. 2009. Chapter 4: Air Basin Trends and Forecasts – Criteria Air Pollutants. In *ARB Almanac 2009.* Sacramento. Pages 4-17–4-19.

6 Ibid. Pages 4-17–4-19.

inversion conditions are more frequent, causing the air pollution to become trapped near the ground beneath a layer of warm air.[7]

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO concentrations include such symptoms as dizziness, headaches, and fatigue. CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases.[8]

As noted, in summer the inclusion of the cool marine layer partly builds up the inversion layer, while transporting CO and other pollutants out of the city. In contrast to problems caused by ozone, which tends to be a regional pollutant, CO problems tend to be localized.

Particulate Matter

PM_{10} consists of particulate matter emitted directly into the air, such as fugitive dust, soot, and smoke from mobile and stationary sources, construction operations, fires and natural windblown dust, and particulate matter formed in the atmosphere by condensation, and/or transformation of SO_2 and ROG.[9] $PM_{2.5}$ is a subgroup of PM_{10}, consisting of smaller particles that have an aerodynamic diameter of 2.5 micrometers or less.[10]

The adverse health effects associated with PM_{10} depend on the specific composition of the particulate matter. For example, health effects may be associated with metals, polycyclic aromatic hydrocarbons, and other toxic substances adsorbed onto fine particulate matter (referred to as the “piggybacking effect”), or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM_{10} may result from both short-term and long-term exposure to elevated concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death.[11] $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and may contain substances that are particularly harmful to human health.

Direct emissions of PM_{10} remained relatively unchanged between 1975 and 2005 and are projected to increase slightly through 2020.[12] PM_{10} emissions in the SFBAAB are dominated by emissions from areawide sources,

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[7] U.S. Environmental Protection Agency. 2009. Six Common Air Pollutants. Available: http://www.epa.gov/air/urbanair/. Accessed August 2009.

[8] Ibid.

[9] Ibid.

[10] California Air Resources Board. 2009. Chapter 4: Air Basin Trends and Forecasts – Criteria Air Pollutants. In *ARB Almanac 2009.* Sacramento. Pages 4-1-4-20.

[11] U.S. Environmental Protection Agency. 2009. Six Common Air Pollutants, op. cit.

[12] California Air Resources Board. 2009. Chapter 4: Air Basin Trends and Forecasts – Criteria Air Pollutants. In ARB Almanac 2009. Sacramento. Page 4-23.

primarily fugitive dust sources. Available PM_{10} data show some variation during the trend period, but overall there has been an upward trend in direct PM_{10} emissions. However, the California and national maximum 24-hour and annual average concentrations have decreased from 1988 to 2007. Although there continues to be variation in the number of state 24-hour standard exceedances, there has been a downward trend in the number of exceedances. The national 24-hour standard has not been exceeded in the SFBAAB since 1991.[13]

Annual average $PM_{2.5}$ concentrations in the SFBAAB have varied, but have shown a slight upward trend from 1999 to 2007. The 98th percentile of California and national 24-hour $PM_{2.5}$ concentrations have both declined during this period. Similar to PM_{10}, year-to-year changes in meteorology can mask the impacts of emission control programs.[14]

Nitrogen Dioxide

NO_2 is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal combustion engines. Combustion devices emit primarily nitric oxide (NO), which reacts through oxidation in the atmosphere to form NO_2.[15] The combined emissions of NO and NO_2 are referred to as NO_X and reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with ozone, the NO_2 concentration in a particular geographical area may not be representative of the local NO_X emission sources.

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including coughing, difficulty in breathing, vomiting, headache, and eye irritation during, or shortly after, exposure. After a period of approximately 4–12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO_2 intoxication after acute exposure has been linked on occasion with prolonged respiratory impairment and such symptoms as chronic bronchitis and decreased lung function.[16]

Sulfur Dioxide

SO_2 is produced by such stationary sources as coal and oil combustion, steel mills, refineries, and pulp and paper mills. The major adverse health effects associated with SO_2 exposure pertain to the upper respiratory tract. SO_2 is a respiratory irritant with constriction of the bronchioles occurring with inhalation of SO_2 at 5 ppm or more. On

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[13] California Air Resources Board. 2009. Chapter 4: Air Basin Trends and Forecasts – Criteria Air Pollutants. In *ARB Almanac 2009*. Sacramento. Page 4-24.

[14] Ibid., page 4-25.

[15] U.S. Environmental Protection Agency. 2009. *Six Common Air Pollutants,* op. cit.

[16] Ibid.

contact with the moist mucous membranes, SO_2 produces sulfurous acid, which is a direct irritant. Concentration rather than duration of the exposure is an important determinant of respiratory effects. Exposure to high SO_2 concentrations may result in edema of the lungs or glottis and respiratory paralysis.

Lead

Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, as discussed in detail below, metal processing is currently the primary source of lead emissions. The highest levels of lead in the air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, EPA set national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. EPA banned the use of leaded gasoline in highway vehicles in December 1995.[17]

As a result of EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector have declined dramatically (95% between 1980 and 1999), and levels of lead in the air decreased by 94% between 1980 and 1999. Transportation sources, primarily airplanes, now contribute only 13% of lead emissions. A National Health and Nutrition Examination Survey reported a 78% decrease in the levels of lead in people's blood between 1976 and 1991. This dramatic decline can be attributed to the move from leaded to unleaded gasoline.[18]

The decrease in lead emissions and ambient lead concentrations over the past 25 years is California's most dramatic success story with regard to air quality management. The rapid decrease in lead concentrations can be attributed primarily to phasing out the lead in gasoline. This phase-out began during the 1970s, and subsequent ARB regulations have virtually eliminated all lead from gasoline now sold in California. All areas of the state are currently designated as attainment for the state lead standard (EPA does not designate areas for the national lead standard). Although the ambient lead standards are no longer violated, lead emissions from stationary sources still pose "hot spot" problems in some areas. As a result, ARB identified lead as a TAC.

Monitoring Station Data

Criteria air pollutants are monitored at several monitoring stations within the SFBAAB. The monitoring station nearest the project sites is at 10 Arkansas Street in San Francisco. This monitoring station measures ozone, NO_2,

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[17] Ibid.
[18] Ibid.

CO, SO_2, PM_{10}, and $PM_{2.5}$. In general, the ambient air-quality measurements from this station are representative of the air quality in the vicinity of the LRDP project sites. Table 4.7-2, "Summary of Annual Ambient Air Quality Data (2006–2008)" (page 4.7-10), summarizes the air quality data from the most recent 3 years (2006–2008).

Table 4.7-2 (page 4.7-10) lists the registered concentrations and exceedances of the CAAQS and NAAQS that occurred at this monitoring station from 2006 through 2008. During this period, the station did not register any days above the state 1-hour or 8-hour ozone standards. The state CO and NO_2 standards were also not exceeded in any of the last 3 years. The state 24-hour PM_{10} standard was exceeded on multiple days in 2006 and 2007, but not once during 2008. The national 24-hour $PM_{2.5}$ standard was exceeded during 2006 and 2007, but not in 2008.

Attainment Status

The determination of whether a region's air quality is healthful or unhealthful is made by comparing contaminant levels in ambient air samples to the CAAQS and NAAQS. Both ARB and EPA use the type of monitoring data presented below (see Table 4.7-3, "Attainment Status of the San Francisco Bay Area Air Basin with Respect to the California and National Ambient Air Quality Standards," page 4.7-11) to designate an area's attainment status with respect to the CAAQS and NAAQS, respectively, for criteria air pollutants. The purpose of these designations is to identify areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are "nonattainment," "attainment," and "unclassified." The "unclassified" designation is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. The most recent attainment designations with respect to the SFBAAB are shown in Table 4.7-3 (page 4.7-11), for each criteria air pollutant. With respect to the CAAQS, the SFBAAB is currently designated as a nonattainment area for ozone, PM_{10}, and $PM_{2.5}$, and as an attainment or unclassified area for all other pollutants (see Table 4.7-3). With respect to the NAAQS, the SFBAAB is designated as a marginal nonattainment area for ozone and as a nonattainment area for $PM_{2.5}$, and in attainment or unclassified area for all other pollutants (see Table 4.7-3).

Criteria Pollutant Emissions—San Francisco County

Table 4.7-4, "Summary of 2008 Estimated Emissions Inventory for Criteria Air Pollutants and Precursors (San Francisco County)" (page 4.7-12), summarizes the emissions inventory for criteria air pollutants within San Francisco County for various source categories. According to San Francisco County's emissions inventory, mobile sources are the largest contributor to the estimated annual average air pollutant levels of ROG, CO, NO_X, and oxides of sulfur (SO_X), accounting for approximately 54%, 96%, 94%, and 99%, respectively, of the total inventory. Areawide sources (e.g., solvent evaporation, on-site fuel combustion for space and water heating, landscape maintenance equipment) account for approximately 68% and 38% of San Francisco County's PM_{10} and $PM_{2.5}$ emissions, respectively.

Table 4.7-2
Summary of Annual Ambient Air Quality Data (2006–2008)[1]

	2006	2007	2008
Ozone			
Maximum concentration (1-hour/8-hour, ppm)	0.053/0.046	0.060/0.053	0.082/0.066
Number of days state standard exceeded (1-hour/8-hour)	0/0	0/0	0/0
Number of days national standard exceeded (1-hour/8-hour) [2]	0.0/0	0.0/0	0.0/0
Carbon Monoxide (CO)			
Maximum concentration (1-hour/8-hour, ppm)	2.7/2.09	2.5/1.60	2.1/2.29
Number of days state standard exceeded (8-hour)	0	0	0
Number of days national standard exceeded (1-hour/8-hour)	0/0	0/0	0/0
Nitrogen Dioxide (NO_2)			
Maximum concentration (1-hour, ppm)	0.107	0.069	0.062
Number of days state standard exceeded	0	0	0
Annual average (ppm)	0.016	0.016	0.016
Sulfur Dioxide (SO_2)			
Maximum concentration (24-hour, ppm)	0.007	0.006	0.004
Number of days state standard exceeded	0	0	0
Number of days national standard exceeded	0	0	0
Fine Particulate Matter ($PM_{2.5}$)			
Maximum concentration (μg/m^3) (National/California[3])	54.3/54.3	45.2/45.2	29.4/39.2
Number of days national standard exceeded (measured/calculated[4])[5]	3/3.1	5/5.1	0/—
State annual average (μg/m^3) (National/California)	9.7/9.7	8.7/8.9	—/11.7
Respirable Particulate Matter (PM_{10})			
Maximum concentration (μg/m^3) (National/California[3])	58.0/61.4	65.7/69.8	41.2/41.3
Number of days state standard exceeded (measured/calculated[4])	3/17.3	2/12.0	0/0.0
Number of days national standard exceeded (measured/calculated[4])	0/0.0	0/0.0	0/0.0
State annual average (μg/m^3) (National/California)	22.9	21.9	2.00

Notes: μg/m^3 = micrograms per cubic meter; ppm = parts per million; — = data not available

[1] Measurements were recorded at the Arkansas Street monitoring station.

[2] The 8-hour national ozone standard was revised to 0.075 ppm in March 2008. Statistics shown are based on the previous 0.08 ppm standard. The 1-hour national ozone standard was revoked on June 15, 2005. Statistics for the 1-hour national ozone standard are shown for informational purposes.

[3] State and national statistics may differ for the following reasons: state statistics are based on California-approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers. State statistics are based on local conditions while national statistics are based on standard conditions. State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

[4] Measured days are those days that an actual measurement was greater than the level of the state daily standard or the national daily standard. Measurements are typically collected every 6 days. Calculated days are the estimated number of days that a measurement would have been greater than the level of the standard had measurements been collected every day. The number of days above the standard is not necessarily the number of violations of the standard for the year.

[5] The national $PM_{2.5}$ 24-hour standard was revised from 65 μg/m^3 to 35 μg/m^3 in 2006. Statistics shown are based on the 65 μg/m^3 standard.

Sources: California Air Resources Board. 2009. Air Quality Data Statistics. Available: www.arb.ca.gov/adam/welcome.html. Accessed July 2009. U.S. Environmental Protection Agency. 2009. Monitor Value Report (NAAQS), Available: www.epa.gov/air/data/geosel.html. Accessed July 2009.

Table 4.7-3
Attainment Status of the San Francisco Bay Area Air Basin with Respect to the California and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Attainment Status	National Attainment Status
Ozone	1-hour	N	—
	8-hour	N	N
Carbon Monoxide (CO)	1-hour	A	U/A
	8-hour	A	U/A
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	—	U/A
	1-hour	A	—
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	—	—
	24-hour	A	A
	3-hour	—	—
	1-hour	A	—
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	N	—
	24-hour	N	U
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	N	U/A
	24-hour	—	N
Lead	30-day Average	A	—
	Calendar Quarter	—	A

Notes: N = nonattainment; A = attainment; U/A = unclassified/attainment; U = unclassified; — = no standard

Sources: California Air Resources Board. 2008. Area Designation Maps/State and National, Available: www.arb.ca.gov/desig/adm/adm.htm/. Accessed June 2009. U.S. Environmental Protection Agency. 2009. Region 9: Air Programs, Air Quality Maps. Available: http://www.epa.gov/region09/air/maps/maps_top.html. Accessed: May 2009.

Table 4.7-4
Summary of 2008 Estimated Emissions Inventory for Criteria Air Pollutants and Precursors (San Francisco County)

Source Type/Category	Estimated Annual Average Emissions (Tons per Day)					
	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Stationary Sources						
Fuel Combustion	0.18	1.75	2.67	0.09	0.30	0.30
Waste Disposal	0.03	0.00	0.00	0.00	0.00	0.00
Cleaning and Surface Coating	3.99	0.00	0.00	–	–	–
Petroleum Production and Marketing	1.43	–	0.00		–	–
Industrial Processes	0.73	0.00	0.01	0.00	0.35	0.21
Subtotal (Stationary Sources)	6.35	1.75	2.69	0.09	0.65	0.51
Areawide Sources						
Solvent Evaporation	8.30	–	–	–	–	–
Miscellaneous Processes	0.66	4.06	2.01	0.08	11.29	2.83
Subtotal (Areawide Sources)	8.97	4.06	2.01	0.08	11.29	2.83
Mobile Sources						
On-Road Motor Vehicles	8.74	81.27	14.95	0.07	0.69	0.47
Other Mobile Sources	9.43	60.40	59.24	14.88	3.87	3.65
Subtotal (Mobile Sources)	18.17	141.67	74.19	14.95	4.56	4.12
Total for San Francisco County	**33.49**	**147.48**	**78.89**	**15.12**	**16.50**	**7.45**

Notes: ROG = reactive organic gases; CO = carbon monoxide; NO_X = oxides of nitrogen; SO_X = oxides of sulfur; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter
Totals in table may not add exactly because of rounding.
Source: California Air Resources Board. 2009. Air Resources Board 2008 Emissions Inventory. Available: http://www.arb.ca.gov/ei/maps/statemap/cntymap.htm. Accessed August 9, 2008.

TOXIC AIR CONTAMINANTS

TACs, or the analogous group of chemicals in the federal regulatory scheme, hazardous air pollutants (HAPs), are defined as a group of air pollutants that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, they may pose a threat to public health even at low concentrations.

According to the *California Almanac of Emissions and Air Quality*,[19] the majority of the estimated health risk from TACs in ambient air is attributed to relatively few compounds, the most dominant being particulate matter exhaust from diesel-fueled engines (DPM). DPM differs from other TACs in that it is not a single substance, but

19 California Air Resources Board. 2009. Chapter 4: Air Basin Trends and Forecasts – Criteria Air Pollutants. In *ARB Almanac 2009*. Sacramento. Pages 4-1-4-34.

rather a complex mixture of hundreds of substances. Although DPM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present.

Unlike the other TACs, no ambient monitoring data are available for DPM because a standardized method for measuring DPM has not been established. However, ARB has made preliminary concentration estimates for DPM. This estimate of DPM concentrations is made using ARB's emissions inventory PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies on chemical speciation of ambient air quality measurements. In addition to DPM, the TACs for which data are available that pose the greatest existing risk from breathing ambient air in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, *para*-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene.[20] It should be noted ARB has also designated asbestos and naturally occurring asbestos as a TAC.

DPM poses the greatest health risk among these 10 TACs. Based on receptor modeling techniques, ARB estimated the DPM health risk in the SFBAAB in 2000 to be 480 excess cancer cases per million people. The health risk associated with DPM decreased by 36% from 1990 to 2000. Overall, ambient levels of most TACs, except *para*-dichlorobenzene, have decreased since 1990.[21]

ODORS

Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell very minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person may be perfectly acceptable to another (e.g., fast food restaurant). It is important to also note that an unfamiliar odor is more easily detected and a transient odor is more likely to result in complaints than a constant one. This is caused by a phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the

[20] Ibid, page 1-34.
[21] Ibid, pages 5-59–5-61.

quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word strong to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Land uses throughout San Francisco that constitute odor sources include industrial facilities, wastewater treatment facilities, and solid-waste transfer facilities. In general, odor dispersal occurs relatively quickly, with noticeable effects diminishing substantially with increasing distance from the source. For example, the San Francisco Public Utilities Commission Southeast Treatment Plant is located at the ocean approximately 1.5 miles east of the St. Luke's Campus. Other examples of minor sources of odors located throughout San Francisco include restaurants and auto body painting establishments.

4.7.2 REGULATORY FRAMEWORK

Air quality within the SFBAAB 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, policymaking, education, and a variety of programs. The agencies primarily responsible for improving the air quality within the SFBAAB are discussed below.

CRITERIA AIR POLLUTANTS

Federal

At the federal level, EPA is charged with implementing national air quality programs. The EPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA), enacted in 1970. The most recent major amendments made by the U.S. Congress occurred in 1990.

The CAA required EPA to establish primary and secondary NAAQS (Table 4.7-1, page 4.7-3). The CAA also required each state to prepare an air quality control plan referred to as a state implementation plan (SIP). The federal Clean Air Act Amendments of 1990 (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA is responsible for reviewing all state SIPs to determine conformation to the mandates of the CAAA and to determine whether implementation will achieve air quality goals. If EPA determines a SIP is inadequate, a federal implementation plan (FIP) that imposes additional control measures may be prepared for the nonattainment area. Failure to submit an approvable SIP or to implement the plan within the mandated time frame may result in application of sanctions to transportation funding and stationary air pollution sources in the air basin.

State

ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, adopted in 1988, required ARB to enhance the state's efforts to attain the CAAQS (Table 4.7-1, page 4.7-3). ARB was created in 1967 under the Mulford-Carrell Air Resources Act, which provided ARB the authority to set CAAQS. To date, CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants have been established. In most cases, the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular attention on reducing the emissions from transportation and areawide emission sources, and provides districts with the authority to regulate indirect sources.

Among ARB's other responsibilities are overseeing local air district compliance with California and federal laws, approving local air quality plans, submitting SIPs to EPA, monitoring air quality, determining and updating area designations and maps, and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

ARB and local air pollution control districts are currently developing plans for meeting new national air quality standards for ozone and $PM_{2.5}$. California's adopted 2007 State Strategy was submitted to EPA as a revision to the SIP in November 2007.[22]

City/Local

BAAQMD manages air quality conditions in San Francisco County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. BAAQMD's clean air strategy includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. BAAQMD also inspects stationary sources of air pollution and

[22] California Air Resources Board. 2008. State Implementation Plans. Available: http://www.arb.ca.gov/planning/sip/sip.htm. Accessed September 2009.

responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the CAA, CAAA, and the CCAA.

In addition, the applicable version of BAAQMD's *Guidelines Assessing the Air Quality Impacts of Projects and Plans* (BAAQMD *CEQA Guidelines*)[23] was released in December 1999. BAAQMD's *CEQA Guidelines* is an advisory document that provides lead agencies, consultants, and project applicant(s) with uniform procedures for addressing air quality in environmental documents. BAAQMD updated its *CEQA Guidelines* most recently on June 17, 2010, and adopted revised CEQA significance thresholds on June 2, 2010. The new guidelines provide methodologies for analyzing air quality impacts for the updated CEQA significance thresholds for construction-related emissions of criteria pollutants, precursors, TACs, and greenhouse gases (GHGs). All of the adopted CEQA thresholds of significance—except for the risk and hazards thresholds for new receptors—are effective June 2, 2010. The risk and hazards thresholds for new receptors are effective January 1, 2011. It is BAAQMD's policy that the adopted thresholds apply to projects for which a notice of preparation is published or environmental analysis begins, on or after the applicable effective date.[24]

Air Quality Plans

BAAQMD prepares plans to attain ambient air quality standards in the SFBAAB, including ozone attainment plans (OAPs) for the national ozone standard and clean air plans (CAPs) for the California standard, in coordination with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG). Past plans include the 2001 OAP and the 2000 CAP. The 2001 OAP is a revision to the SFBAAB part of the SIP and was prepared in response to EPA's partial disapproval of the 1999 OAP. The 2001 OAP for the national 1-hour ozone standard included two commitments for further planning: (1) conduct a midcourse review of progress toward attaining the national 1-hour ozone standard by December 2003, and (2) provide a revised ozone attainment strategy to EPA by April 2004.

The 2000 CAP was adopted by BAAQMD on December 20, 2000, and was submitted to ARB. The CCAA requires BAAQMD to update the CAP for attaining the state 1-hour ozone standard every 3 years. The 2000 CAP is the third triennial update of BAAQMD's original 1991 CAP. The 2000 CAP includes a control strategy review to ensure that the CAP includes all feasible measures to reduce ozone, updates the emissions inventory, estimates emission reductions, and includes an assessment of air quality trends.

In July 2003, EPA proposed an interim final determination that the 2001 OAP corrected the deficiencies of the 1999 OAP and proposed approval of the 2001 OAP. Following 3 years of low ozone levels (2001, 2002, and

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[23] Bay Area Air Quality Management District. 1999 (December). BAAQMD *CEQA Guidelines*, Available: http://www.baaqmd.gov/pln/ceqa/index.htm. Last updated December 1999. Accessed July 2009.

[24] Bay Area Air Quality Management District. 2010 (May). *California Environmental Quality Act Draft Air Quality Guidelines*. Available: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Draft_BAAQMD_CEQA_Guidelines_June_2010_Final.ashx

2003), EPA in October 2003 proposed a finding that the SFBAAB had attained the national 1-hour standard and that certain elements of the 2001 OAP (attainment demonstration, contingency measures, and reasonable further progress) were no longer required. In April 2004, EPA made final the finding that the SFBAAB had attained the 1-hour standard and approved the remaining applicable elements of the 2001 OAP: emission inventory, control measure commitments, motor vehicle emission budgets, reasonably available control measures, and commitments to further study measures. However, as part of a transition from the national 1-hour standard to an 8-hour standard, the 1-hour standard was revoked on June 15, 2005, and is no longer applicable.[25]

In April 2004, EPA designated regions for the new national 8-hour standard, and these designations took effect on June 15, 2004. EPA formally designated the SFBAAB as a nonattainment area for the national 8-hour ozone standard and classified the region as “marginal,” one of five classes of nonattainment areas for ozone ranging from “marginal” to “extreme.” Compliance with the standard is determined at each monitoring station using an average of the fourth-highest ozone reading for 3 years. A violation at any monitoring station results in a nonattainment designation for the entire region because ozone is a regional pollutant. Monitoring data for the San Martin station for the years 2006, 2007, and 2008 show an average of the fourth-highest ozone values of 76 parts per billion (1 part per billion above the standard), and thus the SFBAAB’s “marginal” nonattainment classification. Although certain elements of Phase 1 of the 8-hour implementation rule are still undergoing legal challenge, EPA signed Phase 2 of the 8-hour implementation rule on November 9, 2005; however, it is not currently anticipated that marginal areas will be required to prepare attainment demonstrations for the 8-hour standard.[26]

Nonetheless, there is still a need for continued improvement to meet the state 1-hour ozone standard. BAAQMD, in cooperation with MTC and ABAG, updated the 2005 Bay Area Ozone Strategy (BAOS), which was previously adopted by BAAQMD’s Board of Directors on January 4, 2006. The updated BAOS (i.e., 2010 Clean Air Plan[27]) describes current conditions, reviews the progress in reducing SFBAAB ozone levels to attain state 1-hour and 8-hour ozone standards, and describes how the proposed control strategy for the SFBAAB will fulfill the CCAA planning requirements for the state 1-hour ozone standard and mitigation requirements for transport of ozone and ozone precursors to neighboring air basins. The 2010 Clean Air Plan also considers the impacts of ozone control measures on particulate matter, TACs, and GHGs in a single, integrated plan. The control strategies include stationary source control measures to be implemented through BAAQMD regulations; mobile source control measures to be implemented through incentive programs and other activities; and transportation control measures to be implemented through programs in cooperation with MTC, local governments, transit agencies, and others.

[25] Bay Area Air Quality Management District. 2006. Air Quality Plans. Available at: http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans.aspx. Accessed August 2009.

[26] Ibid.

[27] Bay Area Air Quality Management District. 2010 (March). *Draft Bay Area 2010 Clean Air Plan.* Available: http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans/Clean-Air-Plans.aspx. Accessed May 2010.

Overall, the BAOS is a comprehensive document that describes the strategy for SFBAAB compliance with state 1-hour ozone standard planning requirements and is a significant component of the region's commitment to achieving clean air to protect the public's health and the environment.[28]

BAAQMD Rules and Regulations

BAAQMD is responsible for limiting the amount of emissions that can be generated throughout the SFBAAB by stationary sources. Specific rules and regulations have been adopted that limit emissions that can be generated by various uses and/or activities and identify specific pollution reduction measures that must be implemented in association with various uses and activities. These rules regulate not only the emissions of the state and federal criteria pollutants, but also the emissions of TACs. The rules are also subject to ongoing refinement by BAAQMD.

In general, stationary sources with air emissions are subject to BAAQMD's rules governing their operational emissions. Some emissions sources are further subject to regulation through BAAQMD's permitting process. Through this permitting process, BAAQMD also monitors the amount of stationary source emissions being generated and uses this information in developing the CAP. The primary BAAQMD rules applicable to the project include the following:

- **Regulation 2, Rule 1:** General Permit Requirements;
- **Regulation 6:** Particulate Matter and Visible Emissions;
- **Regulation 7:** Odorous Substances;
- **Regulation 8, Rule 3:** Architectural Coatings;
- **Regulation 8, Rule 15:** Emulsified Asphalt; and
- **Regulation 11, Rule 2:** Asbestos, Demolition, Renovation and Manufacturing.

City and County of San Francisco's Construction Dust Control Ordinance

The San Francisco Construction Dust Control Ordinance (Dust Control Ordinance) was adopted in July 2008, and requires that all site preparation work, demolition, and other construction activities within the City and County of San Francisco comply with specific dust control measures. For projects over 0.5-acre, the Dust Control Ordinance requires that the project sponsor submit a dust control plan for approval by the San Francisco Health Department before issuance of a building permit by the Department of Building Inspection.

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[28] Bay Area Air Quality Management District. 2006, Bay Area 2005 Ozone Strategy. Available: http://www.baaqmd.gov/Divisions/Planning-and-Research/Plans/Bay-Area-Ozone-Strategy.aspx. Accessed August 2009.

The Dust Control Ordinance requires project sponsors and contractors responsible for construction activities to control construction dust on the site or implement other practices that result in equivalent dust control that are acceptable to the Director of Public Health. Dust suppression activities may include watering all active construction areas sufficiently to prevent dust from becoming airborne; increased watering frequency may be necessary whenever wind speeds exceed 15 mph. Reclaimed water must be used if required by Article 21, Section 1100 et seq., of the San Francisco Public Works Code.

Project sites that are more than 0.5 acre and are located within 1,000 feet of sensitive receptors are required to develop a site-specific dust control plan to be approved by the director of the San Francisco Department of Public Health. The site-specific dust control plan for the proposed LRDP shall require the project sponsor to:

- submit a map to the Director of Public Health showing all sensitive receptors within 1,000 feet of the site;
- wet down areas of soil at least three times per day;
- provide an analysis of wind direction and install upwind and downwind particulate dust monitors;
- record particulate monitoring results;
- hire an independent, third party to conduct inspections and keep a record of those inspections;
- establish shut-down conditions based on wind, soil migration, and other factors;
- establish a hotline for surrounding community members who may be potentially affected by project-related dust;
- limit the area subject to construction activities at any one time;
- install dust curtains and windbreaks on the property lines, as necessary;
- limit the amount of soil in hauling trucks to the size of the truck bed and secure with a tarpaulin;
- enforce a 15-mph speed limit for vehicles entering and exiting construction areas;
- sweep affected streets with water sweepers at the end of the day;
- install and use wheel washers to clean truck tires;
- terminate construction activities when winds exceed 25 mph;
- apply soil stabilizers to inactive areas; and
- sweep off adjacent streets to reduce particulate emissions.

Project sponsors are required to designate an individual to monitor compliance with dust control requirements.

TOXIC AIR CONTAMINANTS

Air quality regulations also focus on TACs (or in federal parlance, HAPs). In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level below which adverse health risks, although potentially small, may not be expected to occur. This contrasts with the criteria air pollutants for which acceptable levels of exposure can be determined and for which ambient standards have been established (Table 4.7-1, page 4.7-3). Instead, EPA and ARB regulate TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology for toxics (MACT and BACT, respectively) to limit emissions. These, in conjunction with additional rules set forth by BAAQMD, establish the regulatory framework for TACs.

Federal Hazardous Air Pollutants

The CAA, as amended in 1977, established the National Emissions Standards for Hazardous Air Pollutants (NESHAP) program, which regulated HAPs on a specific pollutant basis. The CAAA (1990 Amendments) modified the NESHAP program under Title III of the CAAA to require emission standards for certain categories of “major sources” and “area sources” that emit one or more pollutants identified as HAPs. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (TPY) of any HAP or more than 25 TPY of any combination of HAPs; all other sources regulated under Title III of the CAAA are considered area sources. Issuance of the emission standards occurs in two phases. The first phase consists of technology-based emission standards designed to produce a high level of emission reductions for major sources of HAPs, which are referred to as MACT standards. For area sources, the standards may be different, based on generally available control technology. In the second phase, EPA must issue health risk-based emissions standards where such standards are deemed necessary to address risks remaining after implementation of the technology-based NESHAPs. These second-phase standards are generally referred to as “residual MACT” standards.

The CAAA also required EPA to issue vehicle or fuel standards containing reasonable requirements to control HAP emissions, applying at a minimum to benzene and formaldehyde. Performance criteria were established to limit mobile-source emissions of toxics, including benzene, formaldehyde, and 1,3-butadiene. In addition, Section 219 of the CAAA also required the use of reformulated gasoline in selected U.S. cities (those with the most severe ozone nonattainment conditions) to further reduce mobile-source emissions, including toxics.

State and Local Toxic Air Contaminant Programs

State Programs

TACs in California are primarily regulated through the Tanner Air Toxics Act (Assembly Bill [AB] 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588, or the Hot Spots Act). AB 1807 sets forth a formal procedure for ARB to designate substances as TACs. Research, public participation, and scientific peer review are necessary before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and adopted EPA's list of HAPs as TACs. Most recently, DPM was added to ARB's list of TACs.

Once a TAC is identified, ARB then adopts an Airborne Toxics Control Measure for sources that emit that a particular TAC. If there is a safe threshold at which there is no toxic effect from a substance, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions.

The Hot Spots Act requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emissions inventory and a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures.

After identifying DPM as a TAC, ARB adopted a comprehensive Risk Reduction Plan in 2000.[29] Pursuant to this Plan, ARB adopted diesel-exhaust control measures and stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In 2001, ARB adopted the Public Transit Bus Fleet Rule and Emissions Standards for New Urban Buses, which established emissions limits on 1985 and subsequent model year heavy-duty bus engines and vehicles for NO_X, CO, nonmethane hydrocarbons, PM, and formaldehyde. The emissions standards apply to all heavy-duty urban buses, including diesel-fueled buses. Therefore, the rule limits the emissions of two TACs identified by ARB: DPM and formaldehyde. In 2007, a low-sulfur diesel fuel requirement and tighter emission standards for heavy-duty diesel trucks was put into effect, to be followed in 2011 by the same standards being applied to off-road diesel equipment. Over time, the replacement of older vehicles will result in a fleet that produces substantially lower levels of TACs than the replaced vehicles. Mobile-source emissions of TACs (e.g., benzene, 1,3-butadiene, DPM) decreased significantly over the last decade and will be reduced further in California through a progression of regulatory measures (e.g., Low-Emission Vehicle/Clean Fuels and Phase II reformulated gasoline regulations) and control technologies. With implementation of ARB's Risk Reduction Plan, DPM concentrations are expected to be reduced by 75% in 2010 and 85% in 2020 from the estimated year-2000 level. As emissions are reduced, it

[29] California Air Resources Board. 2000 (October). *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. Stationary Source Division and Mobile Source Division.. Available: http://www.arb.ca.gov/diesel/documents/rrpapp.htm. Accessed June 2010.

is expected that risks associated with exposure to the emissions will also be reduced. Emissions from heavy-duty diesel equipment associated with the project would be required to comply with the rules outlined above.

In 2005, ARB published the *Air Quality and Land Use Handbook: A Community Health Perspective*, which provides guidance concerning land-use compatibility with TAC sources.[30] Although not a law or adopted policy, the handbook offers recommendations for the siting of sensitive receptors (e.g., proposed residential units) near uses associated with TACs, such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries, dry cleaners, gasoline stations, and industrial facilities, to help limit the exposure of children and other sensitive populations to TACs. ARB received a number of comments on the handbook from air districts, other agencies, real estate representatives, and others. The comments included concern regarding whether ARB might be playing an inappropriate role in local land-use planning and whether it is valid to rely on static air quality conditions during the next several decades, in light of technological improvements; also included were expressions of support for providing information that can be used in local decision-making. ARB may modify the handbook in the future in response to these comments. The handbook is used to assess how much exposure would occur as a result of project implementation.

At the local level, air pollution control or management districts may adopt and enforce ARB control measures. Under BAAQMD Rule 2-1 (General Permit Requirements), Rule 2-2 (New Source Review), and Rule 2-5 (New Source Review of Toxic Air Contaminants), all sources that have the potential to emit TACs are required to obtain permits from BAAQMD. Permits may be granted if the sources are constructed and operated in accordance with applicable regulations, including new source review standards and air toxics control measures. BAAQMD limits emissions and public exposure to TACs through a number of programs and prioritizes TAC-emitting stationary sources based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors.

BAAQMD analyzes sources that require a permit (e.g., performs health risk assessments) based on their potential to emit TACs. If it is determined that the project’s emissions would exceed BAAQMD’s threshold of significance for TACs, as identified below, the source has to implement the BACT for TACs (T-BACT) to reduce emissions. BAAQMD’s T-BACT measures apply to sources such as petroleum and semiconductor industrial facilities, organic liquid storage tanks, solvent cleaning operations, and waste processing facilities, among others. Residential, retail, and commercial uses typically do not require T-BACT measures because of the nominal amounts of TACs generated by these uses. If a source cannot reduce the risk below the threshold of significance even after implementing T-BACT, then BAAQMD will deny the permit. BAAQMD permit requirements help to prevent problems from new emissions sources and reduce emissions from existing sources by requiring them to apply new technology when retrofitting. BAAQMD’s air quality permitting process applies to stationary sources;

[30] California Air Resources Board. 2005 (March 29). *Air Quality and Land Use Handbook: A Community Health Perspective*. Sacramento.

properties that are exposed to elevated levels of TACs from nonstationary sources, and the nonstationary sources themselves (e.g., on-road vehicles), are not subject to air quality permits. Further, for reasons of feasibility and practicality, mobile sources (e.g., cars, trucks) are not required to implement T-BACT even if they have the potential to expose adjacent properties to elevated levels of TACs. Rather, emissions controls on mobile sources are subject to regulations implemented at the federal and state levels by EPA and ARB, respectively.

San Francisco Health Code Article 38

The City of San Francisco's Health Code was amended in October 2008 with Article 38 to require certain urban infill residential developments to install a ventilation system certified to remove more than 80% of ambient $PM_{2.5}$ emissions from habitable areas of the dwelling units. Pursuant to Article 38, certain urban infill development projects require an air quality assessment that evaluates $PM_{2.5}$ concentrations associated with local roadway traffic sources. The CPMC LRDP project does not propose residential uses but, as explained below, the San Francisco Department of Public Health (DPH) considers hospitals to be sensitive land uses for which health risk assessments should be performed if 100,000 vehicles per day occur within a 150-meter radius of the hospital site. Although Article 38 does not apply to the proposed LRDP, the analysis presented in this EIR addresses the potential of the project to affect sensitive receptors as recommended by DPH.

ARB published an Air Quality and Land Use Handbook in 2005, as described above. The ARB handbook recommends that local agencies "avoid siting new sensitive land uses within 500 feet of a freeway [or other] urban roads with volumes of more than 100,000 vehicles/day." This recommendation was based on traffic-related studies showing that the additional noncancer health risk attributable to proximity was seen within 1,000 feet and was strongest within 300 feet. Additionally, California freeway studies show about a 70% drop-off in particulate pollution levels at 500 feet. The nearest roadway to any of the CPMC campuses achieving the 100,000 vehicles/day level is Interstate 80, which is more than 500 feet from the Cathedral Hill Campus.

In 2008, DPH issued guidance for the identification and assessment of potential air quality hazards, and for methods to assess the associated health risks.[31] Based in part on the ARB handbook recommendation, DPH has determined that a potential public health hazard for sensitive land uses, including hospitals, exists when traffic exceeds 100,000 vehicles per day within a 150-meter (approximately 500-foot) radius of any project site boundary. The DPH guidance applies to a broader number of projects than the ARB handbook recommends because the DPH guidance provides that an air quality assessment should be performed when 100,000 vehicles per day occur within a 150-meter radius of the project site, as opposed to when the project site is located near a particular roadway with 100,000 vehicles/day.

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[31] San Francisco Department of Public Health. 2008 (May 6). Assessment and Mitigation of Air Pollutant Health Effects from Intra-urban Roadways: Guidance for Land Use Planning and Environmental Review. Avalable: http://dphwww.sfdph.org/phes/publications/Mitigating_Roadway_AQLU_Conflicts.pdf.

The site of the proposed Cathedral Hill Campus is located within 500 feet of roadways with combined traffic in excess of 100,000 vehicles per day. The major roadways within 500 feet of the site, including Van Ness, Geary, Franklin, and Post, carry a total of approximately 125,236 vehicles per day.[32]

ODORS

Federal

Odors are typically considered a local air quality problem. EPA has not established regulations that deal with the generation of odors. However, local air districts have developed rules that apply to, and regulate the generation of, odors. As shown below in the BAAQMD Rules and Regulations, the air district enforces rules that pertain to odors.

State

As discussed above, odors are considered to be a local problem. The regulatory framework for odors is discussed below under “City/Local.”

City/Local

Although offensive odors rarely cause any physical harm, they can be very unpleasant, leading to considerable stress among the public and often generating citizen complaints to local governments and BAAQMD. BAAQMD’s Regulation 7 (Odorous Substances) places general limitations on odorous substances and specific emission limitations on certain odorous compounds in the SFBAAB. This regulation does not apply until the Air Pollution Control Officer (APCO) receives, within a 90-day period, 10 or more odor complaints alleging that a person or entity has caused odors at or beyond the source’s property line, which are perceived to be objectionable by the complainants in the normal course of their work, travel, or residence. When this regulation becomes effective as a result of complaints, the limits specified in the regulation remain effective until such time as no complaints have been received by the APCO for 1 year. The limits specified by this regulation become applicable again if the APCO receives odor complaints from five or more complainants within a 90-day period.

4.7.3 CUMULATIVE CONDITIONS

Cumulative conditions are presented throughout the cumulative analyses presented below in Impacts AQ-7 (page 4.7-55) and AQ-14 (page 4.7-80).

[32] California Environmental Health Investigations Branch. California Environmental Health Tracking Program Distance-Weighted Traffic Volume Tool. Available: http://www.ehib.org/traffic_tool.jsp.

4.7.4 SIGNIFICANCE CRITERIA

STATE CEQA GUIDELINES APPENDIX G

The thresholds used to determine the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines and guidance from BAAQMD, which have been adopted and modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the CPMC LRDP would result in a significant impact on air quality. In accordance with the criteria listed in Appendix G, implementation of the proposed LRDP would have a significant effect on air quality if it would:

- 7a—conflict with, or obstruct implementation of, the applicable air quality plan;
- 7b—violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- 7c—result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal, state, or regional ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- 7d—expose sensitive receptors to substantial pollutant concentrations; or
- 7e—create objectionable odors affecting a substantial number of people.

APPLICABLE BAAQMD SIGNIFICANCE CRITERIA FOR CRITERIA AIR POLLUTANTS AND TOXIC AIR CONTAMINANTS

As stated in Appendix G, the significance criteria established by the applicable air quality management or air pollution control district may be used to make the above determinations. Pursuant to the applicable (1999) *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans,*[33] the proposed project would result in a significant air quality impact if:

- BAAQMD-recommended control measures are not incorporated into project design or implemented during project construction;
- long-term operational (regional) emissions of ROG, NO_X, or PM_{10} exceed the BAAQMD-recommended mass emissions threshold of 80 pounds per day (lb/day);

[33] Bay Area Air Quality Management District. 1999 (December). *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans.* Available: http://hank.baaqmd.gov/pln/ceqa/ceqa_guide.pdf. Last updated December 1999. Accessed July 2009. Pages 9–25.

- long-term operational (local) mobile-source emissions of CO violate or contribute substantially to a violation of the NAAQS or CAAQS;

- sensitive receptors are exposed to a substantial incremental increase in TAC emissions (e.g., stationary or mobile-source) that exceed 10 chances per million for excess cancer risk and/or a hazard index of 1 for noncancer risk at the maximally exposed individual (MEI); or

- sensitive receptors would be located near an existing odor source where one confirmed complaint per year averaged over a 3-year period, or three unconfirmed complaints per year averaged over a 3-year period, have been experienced by existing receptors as close as the project to the odor source; or for projects locating near a source of odors where there is currently no nearby development and for proposed odor sources near existing receptors, experienced by existing receptors in the vicinity of a similar facility considering distance and frequency of the odor complaints.

4.7.5 IMPACT EVALUATIONS

METHODOLOGY FOR ASSESSING IMPACTS UNDER CEQA AND APPLICABLE (1999) BAAQMD SIGNIFICANCE CRITERIA

Emission Estimation Methods

Construction-Related Emissions[34]

Construction-related emissions of DPM (using $PM_{2.5}$ as a surrogate), criteria air pollutants (e.g., PM_{10} and $PM_{2.5}$), and precursors (e.g., ROG and NO_X) were modeled and assessed using the ARB-approved Off-Road and On-Road Mobile-Source Emission Factor models (OFFROAD and EMFAC, respectively) and methodology from the Urban Emissions (URBEMIS) 2007 Version 9.2.4 computer model. OFFROAD is an emissions factor model used to calculate emission rates from off-road mobile sources (e.g., construction equipment, agricultural equipment). EMFAC is an emissions factor model used to calculate emissions rates from on-road vehicles (e.g., passenger vehicles, haul trucks). URBEMIS is designed to model construction emissions for land use development projects and allows for the input of project-specific information.

All the models used to calculate construction-related emissions contain geographically specific emissions factors and assumptions applicable to the project sites. Detailed near-term and long-term project phasing and construction information (e.g., equipment types and quantities, maximum daily acreage disturbed, number of workers, hours of operation) provided by CPMC was used to estimate construction-related emissions. Where project-specific data

[34] Construction-related DPM emissions were quantified to evaluate impact AQ-2 under the 1999 BAAQMD thresholds. Construction-related criteria pollutant and precursor emissions were quantified to evaluate AQ-9 under the recently adopted BAAQMD thresholds (as discussed at the end of this section).

were not available, default assumptions from URBEMIS were used to estimate construction emissions.[35] Modeling was conducted for each of the four CPMC campuses at which construction would take place under the LRDP (Cathedral Hill, Pacific, Davies, and St. Luke's); no modeling was conducted for the California Campus because no project construction would occur there.

Operational Emissions

The existing site's and proposed LRDP's regional area- and mobile-source emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ were estimated using URBEMIS 2007 Version 9.2.4 computer program,[36] which is designed to model emissions for land use development projects.[37] URBEMIS allows land use selections that include project location and trip generation rates. URBEMIS can account for area-source emissions from the usage of natural gas and landscape maintenance equipment, and for mobile-source emissions associated with vehicle trips. Regional area-source emissions for the existing site and the proposed LDRP were estimated using the proposed land use types and sizes identified in Chapter 2, "Project Description." Regional mobile-source emissions for the existing site and proposed LRDP were estimated based on trip generation rates provided in the traffic study prepared for the project, as well as default settings and parameters contained in URBEMIS 2007 for San Francisco County.[38]

Stationary source criteria pollutant and TAC emissions were estimated using emissions rates from BAAQMD Regulation 9, "Inorganic Gaseous Pollutants"; EPA's *Compilation of Air Pollutant Emission Factors* (AP-42); ARB emission standards for new diesel engines; and the OFFROAD computer model.[39]

Local operational emissions of criteria air pollutants and precursors were assessed in accordance with screening methodologies recommended by ARB and BAAQMD.

Health Risk Assessment

The health risk assessment required emissions estimation, air dispersion modeling, and risk calculations. As detailed above under "Construction-Related Emissions" (page 4.7-26), ENVIRON calculated exhaust emissions of DPM (using $PM_{2.5}$ as a surrogate) from on-site heavy-duty construction equipment, using project-related construction information that CPMC provided. To determine an average emission rate, ENVIRON assumed that

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[35] Construction emissions and stationary-source emissions modeling was conducted for the proposed CPMC LRDP by ENVIRON in 2010. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

[36] Rimpo and Associates. 2008. op. cit.

[37] The 1999 BAAQMD *CEQA Guidelines* establish operational thresholds of significance for ROG, NO_X, and PM_{10}. BAAQMD has not developed a mass emissions threshold of significance for CO and SO_2 because both pollutants are sufficiently controlled by air quality plans and regulations. Therefore, CO and SO_2 emissions are not shown in Table 4.7-7. CO and SO_2 emissions were quantified using URBEMIS and are available for review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case No. 2008.0081E.

[38] LCW Consulting. 2009. op. cit. Pages 24–26, 29.

[39] Construction emissions and stationary-source emissions modeling was conducted for the proposed CPMC LRDP by ENVIRON in 2010. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

total PM emissions from construction were evenly distributed across all construction phases. The estimated mass emissions were entered into the Industrial Source Complex Short-Term 3 (ISCST3) dispersion model for use in the screening mode to estimate ambient concentrations of DPM associated with the proposed LRDP's construction activities. Meteorological conditions used in ISCST3 included every combination of stability class and wind speed to identify worst-case conditions.[40]

Effect of Project Variants on Impact Analyses

The following project variants are included in the LRDP:

Cathedral Hill Campus

- **No Van Ness Avenue Pedestrian Tunnel Variant**: The proposed Van Ness Avenue pedestrian tunnel, which would allow pedestrian travel between Post and Geary Street under Van Ness Avenue, would not be constructed under this variant.

- **Two-Way Post Street Variant**: Post Street between Van Ness Avenue and Gough Street would be configured for two-way traffic, and access routes for the campus would be altered to accommodate this design.

- **MOB [Medical Office Building] Access Variant**: Traffic on Cedar Street would be configured for one-way traffic, and campus access would be altered to accommodate this design.

Excluding the pedestrian tunnel from the proposed Cathedral Hill Campus under the No Van Ness Avenue Pedestrian Tunnel variant would reduce the amount of construction required, thus slightly reducing the amount of diesel emissions generated during construction. As a result, with implementation of this variant, exhaust emissions would be somewhat less than as proposed. However, the decrease would not be significant enough to affect the impact determination for construction emissions at the proposed Cathedral Hill Campus. The Two-Way Post Street and MOB Access variants are not expected to change the construction footprint of the campus, and thus are not expected to significantly change construction emission estimates or associated health risks.

None of the project variants for Cathedral Hill Campus are expected to significantly change the operations (including the number or duration of vehicle trips) at the campus. Hence, the project variants are not expected to significantly change emission estimates, associated health risks for operations (i.e., mobile sources, stationary sources, area sources), or the impact determinations that are derived from them.

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[40] Construction emissions health risk modeling was conducted for the proposed CPMC LRDP by ENVIRON in 2010. Refer to the ENVIRON memo titled, "CPMC Construction Emissions Health Risk Modeling", dated May 26, 2010. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

St. Luke's Campus

- **Alternate Emergency Department Location**: This variant involves relocating the Emergency Department, ambulance bay, and loading dock for the St. Luke's Replacement Hospital.

- **Cesar Chavez Street Utility Line Alignment**: This variant involves using a more direct alignment (out to Valencia Street) for the realigned storm sewer, water main, and other utilities currently located in the San Jose Avenue right-of-way.

Neither of the project variants for St. Luke's Campus is expected to significantly change the construction or operations (including traffic) associated with the campus. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations that are derived from them.

IMPACT AQ-1

Construction activities associated with the LRDP would not result in short-term increases in fugitive dust that exceed BAAQMD CEQA significance criteria (1999 BAAQMD Guidelines). (Significance Criteria 7a and 7b)

Levels of Significance:

- *Cathedral Hill (with or without project variants): Less than significant with mitigation*
- *Pacific: Less than significant with mitigation*
- *Davies: Less than significant with mitigation*
- *St. Luke's (with or without either project variant): Less than significant with mitigation*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

Construction of the near-term projects is anticipated to occur at one or more of the campuses over the course of approximately 10 years; the maximum period of continuous construction at any one campus is approximately 5 years. Construction activities would include site preparation, grading, placement of infrastructure, placement of foundations for structures, and fabrication of structures. Demolition, excavation, and construction activities would require the use of heavy trucks, excavating and grading equipment, and other mobile and stationary construction equipment. 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 would cause emissions during construction. Furthermore, heavy construction activity on dry soil exposed during construction phases would cause dust. Throughout construction, pollutant emissions could vary day to day, depending on the specific phase. When considered in the context of long-term project operations, demolition- and construction-related emissions would be temporary, but these activities still could cause potentially significant effects on local air quality.

According to BAAQMD, PM_{10} is the pollutant of greatest concern with respect to construction-related emissions. Although heavy-duty equipment, material transport, and employee commutes result in emissions of criteria air pollutants (e.g., CO) and ozone precursors (e.g., ROG and NO_X), these emissions are included in the regional emissions inventory, which serves as the basis for the air quality plans, and are not expected to impede attainment of the ozone standard or maintenance of the CO standard in the SFBAAB.[41] Pursuant to the applicable (1999) *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans*,[42] BAAQMD bases its determination of significance on implementation of fugitive PM_{10} dust control measures.[43] Accordingly, the approach to CEQA analyses of construction-related fugitive PM_{10} dust emissions under these Guidelines is to require implementation of effective and comprehensive control measures rather than a detailed quantification of construction emissions.

The implementation of all feasible construction dust control measures would reduce construction emissions to less-than-significant levels. Under the Dust Control Ordinance, the project site, approximately 2.6 acres, requires a dust control plan that describes all dust control measures to be implemented during demolition and construction activities, which is proposed as part of the construction management plan for the LRDP.

The project's construction management plan would include BAAQMD's Basic and Optional Control Measures; however, the measures are not required by law and thus are not considered legally binding through CEQA. To ensure that BAAQMD's Basic and Optional Control Measures included in the project's construction management plan would be legally binding under CEQA, these measures have been included as Mitigation Measure M-AQ-N1a, discussed below. Mitigation Measure M-AQ-N1b would reduce exhaust emissions from construction equipment during project construction. Without implementation of the mitigation measures, **this impact would be significant**.

Cathedral Hill and St. Luke's Campuses with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and applicable (1999) BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for Cathedral Hill and St. Luke's Campuses are expected to significantly change the construction or operations (including the number or duration of vehicle trips) associated with the campuses. Hence, the project

[41] Bay Area Air Quality Management District. 1999 (December). *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans.* op. cit. Page 13.

[42] Ibid. Pages 9–25.

[43] Ibid, pages 13–15.

variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For both campuses, for the same reasons as described previously and without implementation of mitigation measures, **this impact would be significant**.

Mitigation Measures for Cathedral Hill, Davies, and St. Luke's Campuses (Near Term)

M-AQ-N1a: Implement BAAQMD Basic and Optional Control Measures and Additional Construction Mitigation Measures during Construction

The following mitigation measures shall be implemented during construction activities to avoid short-term significant impacts on air quality:

BAAQMD Basic Control Measures

- Water all active construction areas at least twice daily.
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard.
- Pave, apply water three times daily, or apply (nontoxic) soil stabilizer on all unpaved access roads, parking areas, and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites.
- Sweep street daily (with water sweepers) if visible soil material is carried into adjacent public streets.

Optional Control Measures

- Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.
- Install wind breaks, or plant trees/vegetative wind breaks at windward sides of construction areas.
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 20 mph.
- Limit the area subject to excavation, grading, and other construction activities at any one time.

Additional Construction Mitigation Measures

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered twice daily.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All visible mud or dirt trackout onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 mph.
- All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measures, Title 13, Section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturers' specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The air district's phone number shall also be visible to ensure compliance with applicable regulations.

M-AQ-N1b Implement Equipment Exhaust Control Measures during Construction

To reduce exhaust emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ by construction equipment at the CPMC campuses, CPMC and its construction contractor shall implement the following BAAQMD-recommended control measures during construction in both the near term and the long term:

- Idling times shall be minimized, either by shutting equipment off when not in use or by reducing the maximum idling time to 2 minutes, to the extent feasible. Clear signage shall be provided for construction workers at all access points.

- All construction equipment shall be maintained and properly tuned in accordance with the manufacturers' specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition before operation.

All requirements of the Dust Control Ordinance would also be implemented as part of the project, per CPMC's construction management plan to minimize fugitive dust emissions during construction activities. Therefore, construction emissions associated with the LRDP would not violate or contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations.

Implementing Mitigation Measures M-AQ-N1a and M-AQ-N1b at the proposed Cathedral Hill, the Davies, and the St. Luke's Campuses would reduce Impact AQ-1 to a less-than-significant level.

Long-Term Projects

◆ Pacific and Davies Campuses

The long-term impact would be similar to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses without implementation of mitigation measures. For the same reasons as discussed above, **this impact would be significant**.

Mitigation Measures for the Pacific Campus and Davies Campus (Long Term)

M-AQ-L1a: Implement BAAQMD Basic and Optional Control Measures and Additional Construction Mitigation Measures during Construction

This mitigation measure is identical to Mitigation Measure M-AQ-N1a, above**.**

M-AQ-L1b Implement Equipment Exhaust Control Measures during Construction

This mitigation measure is identical to Mitigation Measure M-AQ-N1b, above.

Implementing Mitigation Measures M-AQ-L1a and M-AQ-L1b at the Pacific and the Davies Campuses would reduce Impact AQ-1 to a less-than-significant level.

IMPACT AQ-2 *Construction activities associated with the LRDP would expose sensitive receptors to substantial concentrations of toxic air contaminants (1999 BAAQMD Guidelines). (Significance Criteria 7b and 7d)*

Levels of Significance:

- *Cathedral Hill (with or without project variants): Significant and unavoidable with mitigation*
- *Pacific: Less than significant*
- *Davies: Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Construction-related activities of the LRDP would result in temporary DPM emissions from off-road, heavy-duty diesel equipment for demolition of the existing on-site structures, soil excavation, site grading, and building construction. Health risk assessments conducted for construction activities that would occur for shorter periods than the currently established methodologies for conducting health risk assessments (i.e., 9-, 40-, and 70-year exposure periods) could result in difficulties with producing accurate estimates of health risks. Nevertheless, because of the proximity of sensitive receptors (e.g., residents) to the campuses, health risk assessments for the individual campuses were performed to determine whether sensitive receptors would be exposed to a substantial incremental increase in TAC emissions (e.g., stationary or mobile-source) that exceed 10 chances per million for excess cancer risk at the MEI.

Health risk impacts are localized impacts; therefore, the risks associated with construction activities were evaluated for each campus separately below.

Near-Term Projects

◆ Cathedral Hill Campus

The results of the risk analysis for the MEI (i.e., resident child) are summarized in Table 4.7-5, "Screening-Level Analysis of Health Risks from Construction Emissions for All Campuses" (page 4.7-35). According to the analysis, the LRDP's construction-related TAC emissions at the proposed Cathedral Hill Campus would generate a cancer risk of approximately 17 in a million at the maximally exposed off-site individual, assuming the receptor is a resident child. This level exceeds the threshold of 10 in a million. These results reflect a conservative, screening-level estimate; additional, more refined modeling would better characterize risk associated with construction at Cathedral Hill Campus and would result in smaller impacts. However, based on the screening-level evaluation, the LRDP's construction-related DPM emissions would be considered potentially significant under BAAQMD's applicable (1999) Air Quality Guidelines. Due to the scale of the construction activities and proximity to adjacent receptors, **the health risk impacts from construction of the Cathedral Hill Campus could be above BAAQMD's significance threshold and therefore would be potentially significant**.

Cathedral Hill Campus with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable (1999) BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for Cathedral Hill Campus are expected to significantly change the construction or operations (including the number and duration of vehicle trips) associated with the campus. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For the Cathedral Hill Campus project variants, for the same reasons as described previously, **this impact would be potentially significant**.

Table 4.7-5
Screening-Level Analysis of Health Risks from Construction Emissions for All Campuses

Campus	Estimated Excess Cancer Risk at MEIR – Adult Exposure Parameters	Estimated Excess Cancer Risk at MEIR – Child Exposure Parameters
Cathedral Hill	9	17
Davies Neuroscience Institute	1	2
Davies Castro Street/14th Street MOB	0	1
Pacific	2	3
St. Luke's Replacement Hospital	2	4
St. Luke's MOB	1	1
BAAQMD Threshold	10	10

Notes: BAAQMD = Bay Area Air Quality Management District; MEIR = maximally exposed individual receptor; MOB = medical office building.
Source: ENVIRON. 2010 (May 26). *CPMC Construction Risk Analysis.* San Francisco, CA. Memorandum to CPMC. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

Mitigation Measures for Cathedral Hill Campus (Near Term)

M-AQ-N2 Install Accelerated Emission Control Device on Construction Equipment.

To reduce risk associated with exhaust emissions of DPM by construction equipment during construction of the Cathedral Hill Campus and all other LRDP sites, CPMC and its construction contractor shall implement the following BAAQMD-recommended control measures during construction:

- Implement Accelerated Emission Control Device Installation on Construction Equipment. To minimize the potential impacts on residents living near the CPMC campuses from the construction activities in that area, CPMC shall make reasonable efforts to ensure that all construction equipment used at these campuses would use equipment that meets the EPA Tier 4 engine standards for PM and NO_X control (or equivalent) throughout the entire duration of construction activities, to the extent that equipment meeting the EPA Tier 4 engine standards is available to the contractor at the time construction activities requiring the use of such equipment occur.

While it is possible that Mitigation Measure M-AQ-N2 could reduce the carcinogenic risk and chronic noncarcinogenic health hazards posed by DPM emissions below the thresholds, it is unknown at this time to what extent such equipment will be available at the time of construction. In light of this uncertainty, this **impact would remain significant and unavoidable**.

◆ Davies Campus

According to the risk analysis summarized in Table 4.7-5 (page 4.7-35), the construction-related TAC emissions that would result from development of the proposed Davies Campus would result in an estimated excess cancer risk of approximately 2 in a million at the MEI (e.g., resident child). This level is below the threshold of 10 in a million; therefore, **this impact would be less than significant**.

Improvement Measure for Davies Campus (Near Term)

I-AQ-N2 This improvement measure is identical to Mitigation Measure M-AQ-N2 for the Cathedral Hill Campus.

Implementing Improvement Measure I-AQ-N2 at the Davies Campus would further reduce the carcinogenic risks and chronic noncarcinogenic health hazards posed by DPM emissions during construction activities associated with development.

◆ St. Luke’s Campus

According to the risk analysis summarized in Table 4.7-5 (page 4.7-35), the LRDP’s construction-related DPM emissions at the St. Luke’s Campus would result in an estimated excess cancer risk of approximately 4 in a million at the MEI (e.g., resident child). This level is below the threshold of 10 in a million; therefore, **this impact would be less than significant.**

The same group of receptors will be impacted by both the hospital and the MOB construction projects at St. Luke’s Campus; therefore, the risk estimates for both projects should be considered cumulatively. A conservative estimate of overall risk from construction for these receptors would be the sum of the risks calculated for each construction project. As shown in Table 4.7-5, the sum of the estimated excess cancer risks for both St. Luke’s projects is approximately 5 in a million at the MEI (e.g., resident child); therefore, **this impact would be less than significant**.

St. Luke's Campus with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable (1999) BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for the St. Luke's Campus are expected to significantly change the construction or operations (including traffic) associated with the campuses. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For the St. Luke's Campus, for the same reasons as described previously, **this impact would be less than significant**.

Improvement Measure for St. Luke's Campus (Near Term)

I-AQ-N2 This improvement measure is identical to Mitigation Measure M-AQ-N2 for the Cathedral Hill Campus.

Implementing Improvement Measure I-AQ-N2 would further reduce the carcinogenic risks and chronic noncarcinogenic health hazards posed by DPM emissions during construction activities associated with development.

Long-Term Projects

◆ Pacific Campus

According to the risk analysis summarized in Table 4.7-5 (page 4.7-35), the LRDP's construction-related TAC emissions at the Pacific Campus would result in an estimated excess cancer risk of approximately 3 in a million at the MEI (e.g., resident child); therefore, **this impact would be less than significant**.

Improvement Measure for Pacific Campus (Long Term)

I-AQ-L2 This improvement measure is identical to Mitigation Measure M-AQ-N2 for the Cathedral Hill Campus.

Implementing Improvement Measure I-AQ-L2 would further reduce the carcinogenic risks and chronic noncarcinogenic health hazards posed by DPM emissions during construction activities associated with development.

◆ Davies Campus

According to the risk analysis summarized in Table 4.7-5 (page 4.7-35), the construction-related TAC emissions that would result from development of the proposed Castro Street/14th Street MOB at the Davies Campus would result in an estimated excess cancer risk of approximately 1 in a million at the MEI (e.g., resident child); therefore, **this impact would be less than significant**.

The same group of receptors will be impacted by both near-term and long-term construction projects at the Davies Campus; therefore, the risk estimates for both projects should be considered cumulatively. A conservative estimate of overall risk from construction for these receptors would be the sum of the risks calculated for each construction project. As shown in Table 4.7-5, the sum of the estimated excess cancer risks for both Davies projects is approximately 3 in a million at the MEI (e.g., resident child); therefore, **this impact would be less than significant**.

Improvement Measure for Davies Campus (Long Term)

I-AQ-L2 This improvement measure is identical to Mitigation Measure M-AQ-N2 for the Cathedral Hill Campus.

Implementing Improvement Measure I-AQ-L2 would further reduce the carcinogenic risks and chronic noncarcinogenic health hazards posed by DPM emissions during construction activities associated with development.

IMPACT AQ-3 *Operation of the LRDP would exceed BAAQMD CEQA significance thresholds for mass emissions of criteria pollutants and would contribute to an existing or projected air quality violation at full buildout (1999 BAAQMD Guidelines). (Significance Criteria 7a and 7c)*

Levels of Significance:

- *Cathedral Hill (with or without project variants): Significant and unavoidable*
- *Pacific: Significant and unavoidable*
- *Davies: Significant and unavoidable*
- *St. Luke's (with or without either project variant): Significant and unavoidable*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

As shown in Table 4.7-6, "Emissions of Criteria Air Pollutants and Precursors Attributable to Operations under the LRDP—Modeled Daily Net Changes from Existing Conditions" (page 4.7-39), and Table 4.7-7, "Emissions of Criteria Air Pollutants and Precursors Attributable to Operation of Projects under the LRDP—Modeled Annual

Table 4.7-6
Emissions of Criteria Air Pollutants and Precursors Attributable to Operations under the LRDP—Modeled Daily Net Changes from Existing Conditions

Source	Emissions (lb/day)[a, b, c, e]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
2030 Conditions				
Cathedral Hill Campus				
Area sources	3.5	2.1	–	–
Mobile sources	18.4	20	104	20
Stationary sources	5.4	13.6	–	7.7
Cathedral Hill Campus Total	**27.3**	**35.7**	**104**	**27.7**
Pacific Campus[d]				
Area sources	-0.4	-0.5	–	–
Mobile sources	-4.4	-4.7	-24.7	-4.6
Pacific Campus Total	**-4.8**	**-5.2**	**-24.7**	**-4.6**
Davies Campus				
Area sources	1.3	1	0.02	0.02
Mobile sources	2.4	2.5	13.3	2.5
Stationary sources	0.01	0.1	–	0.02
Davies Campus Total	**3.7**	**3.6**	**13.3**	**2.5**
St. Luke's Campus				
Area sources	0.4	1.2	–	–
Mobile sources	4.6	4.9	26	5
Stationary sources	0.02	-1.2	–	-0.02
St. Luke's Campus Total	**5.0**	**4.9**	**26**	**5**
Total Unmitigated Emissions	**31**	**39**	**119**	**31**
1999 BAAQMD significance criterion	80	80	80	–

Notes: BAAQMD = Bay Area Air Quality Management District; lb/day = pounds per day; NA = not applicable; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; ROG = reactive organic gases.

[a] Area and Mobile source emissions modeled using the URBEMIS 2007 (Version 9.2.4) computer model, based on proposed land uses identified in Chapter 2, "Project Description," and trip generation rates obtained from the traffic analysis in Section 4.5, "Transportation and Circulation," of this EIR.

[b] Negative values indicate a net reduction in emissions compared to existing conditions.

[c] Totals may not add exactly because of rounding.

[d] No new stationary sources are planned for Pacific Campus.

[e] $PM_{2.5}$ emissions are compared against proposed significance thresholds under Impact AQ-11.

Source: Area and mobile source emissions modeled by AECOM in 2010; stationary source emissions modeled by ENVIRON 2009–10. Information on these calculations is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E

Table 4.7-7
Emissions of Criteria Air Pollutants and Precursors Attributable to Operation of Projects under the LRDP—Modeled Annual Net Changes from Existing Conditions

Source	Emissions (TPY)[a, b, c, e]			
	ROG	NO_X	PM_{10}	$PM_{2.5}$
2030 Conditions				
Cathedral Hill Campus				
Area sources	0.7	0.4	-0.02	-0.02
Mobile sources	3.6	4.2	19	3.6
Stationary sources	1.0	2.60	<0.001	1.4
Cathedral Hill Campus Total	**5.3**	**7.2**	**19**	**5**
Pacific Campus[d]				
Area sources	-0.08	-0.09	<0.001	<0.001
Mobile sources	-0.85	-1	-4.5	-0.85
Pacific Campus Total	**-0.9**	**-1.1**	**-4.5**	**-0.9**
Davies Campus				
Area sources	0.2	0.2	<0.001	<0.001
Mobile sources	0.5	0.5	2.4	0.5
Stationary sources	0.01	0.03	<0.001	0.004
Davies Campus Total	**0.7**	**0.7**	**2.4**	**0.5**
St. Luke's Campus				
Area sources	0.07	0.23	<0.001	<0.001
Mobile sources	0.9	1	4.7	0.9
Stationary sources	0.003	-0.2	<0.001	-0.005
St. Luke's Campus Total	**1**	**1**	**4.7**	**0.9**
Total unmitigated emissions	**6**	**8**	**22**	**5.5**
Recently adopted BAAQMD significance criterion	15	15	15	–

Notes: BAAQMD = Bay Area Air Quality Management District; NA = not applicable; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; ROG = reactive organic gases; TPY = tons per year.

[a] Area and mobile source missions modeled using the URBEMIS 2007 (Version 9.2.4) computer model, based on proposed land uses identified in Chapter 2, "Project Description," and trip generation rates obtained from the traffic analysis in Section 4.5, "Transportation and Circulation," of this EIR. Stationary source emissions

[b] Negative values indicate a net reduction in emissions compared to existing conditions.

[c] Totals may not add exactly because of rounding.

[d] No new stationary sources are planned for Pacific Campus.

[e] $PM_{2.5}$ emissions are compared against proposed significance thresholds under Impact AQ-11.

Source: Area and mobile source emissions modeled by AECOM in 2010; stationary source emissions modeled by ENVIRON 2009-10. Information on these calculations is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E

Net Changes from Existing Conditions" (page 4.7-40) the net change in operational PM_{10} emissions from implementation of projects under the CPMC LRDP (119 pounds/day, 22 tons/year) would exceed BAAQMD's applicable daily and annual emission significance criteria (80 pounds/day, 15 tons/year). No feasible mitigation is available to reduce this impact to less than significant. Therefore, operation of proposed LRDP projects would result in or contribute to a violation of air quality standards. Thus, under the applicable (1999) BAAQMD CEQA significance criteria, no feasible mitigation is available to reduce this impact to a less-than-significant level and **this impact would be significant and unavoidable**.

Cathedral Hill and St. Luke's Campuses with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable (1999) BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for Cathedral Hill and St. Luke's Campuses are expected to significantly change the construction or operations (including the number and duration of vehicle trips) associated with the campuses. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them.

For both campuses' project variants, for the same reasons as described previously, **this impact would be significant and unavoidable**.

Long-Term Projects

◆ Pacific and Davies Campuses

The long-term impact would be similar to the near-term impact identified above. No feasible mitigation is available to reduce this impact to a less-than-significant level. Therefore, for the same reasons as discussed above, **this impact would be significant and unavoidable**.

IMPACT AQ-4 *Operation of the LRDP would not cause local concentrations of CO from motor vehicle exhaust to exceed state and federal ambient air quality standards (1999 BAAQMD Guidelines). (Significance Criterion 7b)*

Levels of Significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: Less than significant*
- *Davies: Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

CO concentration is a direct function of motor vehicle activity (particularly during peak commute hours) and meteorological conditions. Under specific meteorological conditions, CO concentrations may reach unhealthy levels for local sensitive land uses, such as residential areas, schools, preschools, playgrounds, and hospitals. As a result, BAAQMD recommends analysis of CO emissions at a local rather than a regional level. In support of its recently adopted *CEQA Guidelines* update, BAAQMD provides a screening methodology based on peak hourly traffic volumes at affected intersections. If a project would contribute 44,000 vehicles per hour to an intersection, or 24,000 vehicles per hour for intersections where vertical or horizontal air mixing would be limited, this situation would represent a condition where a project could violate or contribute to a violation of ambient air quality standards for CO.

None of the affected intersections near the CPMC LRDP campuses would experience more than 24,000 vehicles per hour at buildout under the LRDP;[44] therefore, the LRDP would not contribute to a violation of the 1-hour ambient air quality standard of 20 ppm or the 8-hour standard of 9 ppm. Thus, the proposed CPMC LRDP would not expose sensitive receptors to significant CO levels. As a result, **this impact would be less than significant**.

Cathedral Hill and St. Luke's Campuses with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable (1999) BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for Cathedral Hill and St. Luke's Campuses are expected to significantly change the construction

[44] Based on the traffic impact analyses for each campus. Information on these calculations is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

or operations (including the number and duration of vehicle trips) associated with the campuses. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For both campuses' project variants, for the same reasons as described previously, **this impact would be less than significant**.

Long-Term Projects

◆ Pacific and Davies Campuses

This long-term impact would be similar to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. Therefore, for the same reasons as discussed above, **this impact would be less than significant**.

IMPACT AQ-5 *Operations at the LRDP would not expose sensitive receptors to substantial concentrations of toxic air contaminants (1999 BAAQMD Guidelines). (Significance Criterion 7d)*

Levels of Significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: Less than significant*
- *Davies: Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

The exposure of sensitive receptors to TAC emissions during operation of the LRDP is discussed separately for each campus because the impacts of TAC emissions are localized. The applicable BAAQMD threshold for TAC emissions is described in the "Significance Criteria" subsection, starting on page 4.7-25 above. This impact analysis considers both the impact of the project's stationary sources and emissions associated with truck loading bays on off-site receptors, and the impact of off-site sources on on-site sensitive receptors.

Near-Term Projects

◆ Cathedral Hill Campus

Impact of Project Sources on Off-Site Receptors

Near-term campus operations under the LRDP would involve the use of stationary sources of TACs, such as diesel-fueled backup generators and central heating boilers. The net changes in emissions of DPM from on-site stationary sources associated with near-term projects were evaluated.[45] These changes, as they apply to operations at the proposed Cathedral Hill Campus, are summarized below.

- **Natural Gas Boilers and Water Heaters:** Cathedral Hill Campus would not experience a net change in incremental toluene or benzene emissions from boilers that would exceed applicable (1999) BAAQMD trigger thresholds; however, formaldehyde exceeds the applicable trigger level. These trigger thresholds are set to ensure, under the most conservative source configuration, that risks are below significance thresholds. BAAQMD trigger thresholds are screening levels for TAC emissions from equipment. A screening risk assessment was conducted using the SCREEN3 air dispersion model, which was run using all its combinations of meteorological conditions to determine the worst-case maximum downwind 1-hour average dispersion factor for exhaust from the new Cathedral Hill boilers.[46] Because chronic noncancer and incremental cancer risk involves annual averaging periods, the 1-hour average dispersion factor was multiplied by 0.1 to estimate annual average dispersion.[47] Multilevel buildings are located near the proposed new generators, multiple receptor heights, from ground level up to 60 meters, were used during the screening modeling. According to the screening evaluation,[48] the incremental cancer risk associated with the TAC emissions from the proposed new boilers at the Cathedral Hill Campus would be approximately 0.04 in a million, well below BAAQMD's significance criterion of 10 in a million. The chronic noncancer hazard index would be approximately 0.0004, well below the significance threshold of one.

- **Diesel-Fueled Generators:** There are no diesel-fueled generators at the existing hotel building, but one fire pump will be decommissioned. The project sponsor would operate three generators at the proposed Cathedral Hill Hospital and one generator at the Cathedral Hill MOB. The net change in DPM emissions will exceed the BAAQMD trigger threshold; as a result, a screening risk assessment was performed to determine the chronic noncancer or incremental cancer risk from the new emergency generators. To perform this analysis, the SCREEN3 air dispersion model was run using all its combinations of meteorological conditions to determine the worst-case maximum downwind 1-hour average dispersion factor for exhaust from the new Cathedral Hill generators. Because chronic noncancer and incremental cancer risk involves annual averaging periods, the 1-

45 Operational emissions estimation was conducted for the proposed CPMC LRDP by ENVIRON. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

46 On November 9, 2005, the USEPA promulgated final revisions to the federal *Guideline on Air Quality Models*, in which they recommended that AERMOD be used for dispersion modeling evaluations of criteria air pollutant and toxic air pollutant emissions from typical industrial facilities. A one-year transition period commenced from the proposed effective date of December 9, 2005. Although that one year transition period has elapsed, the BAAQMD continues to recommend using ISCST3, in addition to AERMOD, for these types of evaluations (see http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_June%202010.ashx). Furthermore, due to the lack of representative meteorological data collected in downtown San Francisco, screening meteorological data was used; the screening version of AERMOD (AERSCREEN) is still undergoing development and is not currently available.

47 BAAQMD. 2007. *Permit Modeling Guidance*. June. Available at: http://www.baaqmd.gov/Divisions/Planning-and-Research/Research-and-Modeling/~/media/7C2B7FE81AF14B49811B3C12AEBF971C.ashx.

48 Modeling provided by ENVIRON in 2010. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

hour average dispersion factor was multiplied by 0.1 to estimate annual average dispersion.[49] Multilevel buildings are located near the proposed new generators, multiple receptor heights, from ground level up to 60 meters, were used during the screening modeling. Results of the screening evaluation are summarized in Table 4.7-8, "Screening Evaluation of Health Risks Associated with Diesel Particulate Matter (DPM) Emissions from Proposed Generators—Cathedral Hill Campus" (page 4.7-46). According to the results of the screening evaluation, the incremental risk associated with the diesel emissions from the proposed new generators at the Cathedral Hill Campus would be below BAAQMD's significance criteria.

- **On-Site Mobile Sources (Truck Loading):** For the LRDP, on-site mobile sources of TACs would be associated primarily with the operation of on-road heavy-duty diesel trucks used for proposed on-site commercial activities (e.g., loading and unloading). A screening-level analysis was performed to determine if on-site truck delivery operations to each campus would be subject to the recommendations of the ARB handbook (i.e., siting sensitive receptors 1,000 feet from commercial trucking activities).[50] Following project implementation, the proposed Cathedral Hill Campus would expect approximately 165 vehicle deliveries per day; however, not all trucks would be heavy heavy-duty diesel trucks (i.e., the type of trucks associated with the commercial trucking operations that were examined in ARB's *Air Quality and Land Use Handbook*). The fleet distribution of trucks that would make trips to the proposed Cathedral Hill Campus would also include light- and medium-duty trucks. Assuming that the same fleet distribution applies to the proposed Cathedral Hill Campus as was determined for the Pacific Campus (see Page 4.7-48), it is reasonable to conclude that TAC emissions associated with vehicle deliveries would be lower than the equivalent of 41 heavy heavy-duty trucks per day.[51] The Cathedral Hill Campus would comply with the ARB's recommendations to avoid siting sensitive receptors within 1,000 feet of a land use that accommodates more than 100 truck deliveries per day.[52]

Thus, it is anticipated that TACs at on-site or off-site sensitive receptor locations considered in this analysis would not exceed the criterion for acceptable risk for the MEI.

[49] BAAQMD. 2007. *Permit Modeling Guidance*. June. Available: http://www.baaqmd.gov/Divisions/Planning-and-Research/Research-and-Modeling/~/media/7C2B7FE81AF14B49811B3C12AEBF971C.ashx.

[50] ENVIRON. 2010 (February 22). Evaluation of CPMC Campus Delivery Vehicle Traffic with Respect to ARB's Distribution Center Definition. San Francisco, CA. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

[51] Ibid.

[52] Ibid.

Table 4.7-8
Screening Evaluation of Health Risks Associated with Diesel Particulate Matter (DPM) Emissions from Proposed Generators—Cathedral Hill Campus[a]

Receptor Height (meters)[b]	Incremental DPM Concentration ($\mu g/m^3$)[c]	Chronic Noncancer Hazard Index[c]	Inhalation Risk (excess cancer cases per million)[c]
0	0.001	2E-04	0.6
20	0.001	2E-04	0.6
60	0.003	6E-04	1.5
Applicable BAAQMD significance threshold [d]		*1.0*	*10*

Notes: $\mu g/m^3$ = micrograms per cubic meter

[a] Evaluation performed with the USEPA's SCREEN3 air dispersion model using worst-case meteorological data, emission stack parameters provided by CPMC, and estimated annual DPM emissions from new generators at (a) Cathedral Hill Hospital and (b) Medical Office Building. Separate analyses were performed for the two buildings; for a conservative estimate of total risk, the individual risk estimates at each receptor height for both buildings were summed.

[b] Receptor heights relative to ground surface were based on roof heights of surrounding buildings.

[c] Risks at each height are compared separately to the BAAQMD significance thresholds; the risks for different receptor heights are not additive.

[d] Significance thresholds are from the 1999 BAAQMD CEQA Guidelines.

Source: Modeling provided by ENVIRON in 2010. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E

Impact of Off-Site Sources on On-Site Receptors

ENVIRON modeled the combined effects of emissions of TACs from stationary sources and roadways within 1,000 feet of the proposed Cathedral Hill Campus to evaluate how off-site sources affect on-site receptors. Such an analysis provides a more conservative estimate of risk for an on-site receptor than an analysis involving only one off-site source. On-site patient receptors at the proposed hospitals were identified as the sensitive receptors for the purposes of this project. Because patients' duration of stay at the hospital would be temporary, it was determined that examining cancer or chronic noncancer health risk to patients at the proposed hospitals does not apply because no chronic exposure would occur. Thus, acute-risk hazard index (HI) was modeled under cumulative conditions (i.e., under consideration of both off-site and on-site sources).

All estimated acute noncancer HIs for on-site patients associated with exposures to TAC emissions from the stationary sources considered in this cumulative analysis would be well below the significance criterion of an HI of 1 (Table 4.7-9, "Acute Noncancer Hazard Indices Associated with Cumulative Stationary Source TACs for On-Site Receptors," page 4.7-47).

Table 4.7-9
Acute Noncancer Hazard Indices Associated with Cumulative Stationary Source TACs for On-Site Receptors

Campus	Acute Noncancer Hazard Index
Cathedral Hill	0.013
St. Luke's	0.004
Pacific	0.276
Davies	0.129

Notes: TAC = toxic air contaminant
Source: ENVIRON. 2010 (April 7). *Cumulative Health Risk Analysis for California Pacific Medical Center's Davies, Pacific, St. Luke's Campus and Proposed Cathedral Hill Campuses.* San Francisco, CA. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E

The impact of roadway traffic was evaluated using estimates provided in BAAQMD's recently adopted *Air Quality Guidelines* (June 2, 2010). The highest acute HI among the five San Francisco roadways studied was 0.07 for a receptor located 100 feet away. At 500 feet, the acute HI drops to 0.02 or lower. At 700 feet, the roadways studied have an acute HI of 0 except for Interstate 80, which has an acute HI of 0.01 at this distance. Based on these estimates, the contribution of TACs from roadway traffic emissions would not produce a total acute HI value that exceeds BAAQMD's recently adopted criterion for acute noncancer HI of 1 at any of the four campuses.

For example, the campus with the highest estimated acute noncancer HI from stationary sources (Pacific Campus, HI = 0.276) would need to be within 100 feet of 10 major roadways before the total acute HI would approach a value of 1. Thus, it can be reasonably concluded that the actual acute noncancer HI values from the combination of stationary sources and roadway traffic would be well below BAAQMD's criterion of 1.

Conclusion

For the reasons described above, **the impact of TACs would be less than significant for on-site operational emissions on off-site receptors or off-site emissions on on-site sensitive receptors**.

Cathedral Hill Campus with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable (1999) BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for Cathedral Hill Campus are expected to significantly change the construction or operations (including the number and duration of vehicle trips) associated with the campus. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For the Cathedral Hill Campus project variants, for the same reasons as described previously, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the proposed Cathedral Hill Campus in the near term.

◆ Davies Campus

Impact of Project Sources on Off-Site Receptors

- **Natural Gas Boilers and Water Heaters:** Davies Campus would not experience a net change in incremental TAC emissions from boilers that would exceed applicable (1999) BAAQMD trigger thresholds. These trigger thresholds are set to ensure, under the most conservative source configuration, that risks are below significance thresholds. BAAQMD trigger thresholds are screening levels for TAC emissions from equipment; above those thresholds, dispersion modeling and further analyses are warranted. TAC emissions from equipment would not exceed BAAQMD trigger thresholds and thus would be less than BAAQMD's CEQA significance criteria for TACs.

  Diesel-Fueled Generators: The impact of operational emissions of TACs at the Davies Campus in the near term would be similar to the impact at the proposed Cathedral Hill Campus. The differences in near-term TAC emissions at the two campuses would result from the differences in generators used. At the Davies Campus, one new generator would be installed, and no existing generators would be removed. Adding the new generator would result in an incremental increase in DPM emissions that would exceed the BAAQMD trigger threshold. Thus, a screening risk assessment was performed to determine the chronic noncancer or incremental cancer risk from the new emergency generator. To perform this analysis, the SCREEN3 model was run using all the model's combinations of meteorological conditions to determine the worst-case maximum downwind 1-hour average dispersion factor for exhaust from the new Davies Campus generator and multiplied by 0.1 to estimate average annual dispersion.[53] Results of the screening evaluation are summarized in Table 4.7-10, "Screening Evaluation of Health Risks Associated with Diesel Particulate Matter Emissions from Proposed Generator—Davies Campus" (page 4.7-49). Because multilevel buildings are located near the proposed new generator, multiple receptor heights, from ground level up to 30 meters, were used during the screening modeling. According to the results of the screening evaluation, the incremental risk associated with the diesel emissions from the proposed new generator at the Davies Campus would be below BAAQMD's significance criteria.

[53] Construction emissions and stationary-source emissions modeling was conducted for the proposed CPMC LRDP by ENVIRON. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

Table 4.7-10
Screening Evaluation of Health Risks Associated with Diesel Particulate Matter Emissions from Proposed Generator—Davies Campus[a]

Receptor Height (meters)[b]	Incremental DPM Concentration ($\mu g/m^3$)[c]	Chronic Noncancer Hazard Index[c]	Inhalation Risk (excess cancer cases per million)[c]
0	0.004	9E-4	1
20	0.008	2E-3	2
30	0.005	1E-3	2
Applicable BAAQMD significance threshold [d]		*1.0*	*10*

Notes: $\mu g/m^3$ = micrograms per cubic meter

[a] Evaluation performed with USEPA's SCREEN3 air dispersion model using worst-case meteorological data, emission stack parameters provided by CPMC, and estimated annual DPM emissions from the new generator.

[b] Receptor heights relative to ground surface were are based on roof heights of surrounding buildings.

[c] Risks at each height are compared separately to the BAAQMD significance thresholds; the risks for different receptor heights are not additive.

[d] Significance thresholds from the 1999 BAAQMD CEQA Guidelines.

Source: Modeling provided by ENVIRON in 2010. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E

On-Site Mobile Sources (Truck Loading): According to the traffic study, the Davies Campus would have fewer than 100 daily truck deliveries. As a result, the Davies Campus would comply with ARB's recommendations to avoid siting sensitive receptors within 1,000 feet of a land use that accommodates more than 100 truck deliveries per day.[54]

Impact of Off-Site Sources on On-Site Receptors

As shown in Table 4.7-9, all estimated acute noncancer HIs for on-site patients at the Davies Campus associated with exposures to TAC emissions from stationary sources considered in this cumulative analysis would be well below the significance criterion of an HI of 1.

Overall, for similar reasons as described above for the proposed Cathedral Hill Campus, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the near term.

[54] ENVIRON. 2010 (February 22). Evaluation of CPMC Campus Delivery Vehicle Traffic with Respect to ARB's Distribution Center Definition. San Francisco, CA. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

◆ St. Luke's Campus

Impact of Project Sources on Off-Site Receptors

- **Natural Gas Boilers and Water Heaters:** St. Luke's would not experience a net change in incremental TAC emissions from boilers that would exceed applicable (1999) BAAQMD trigger thresholds. These trigger thresholds are set to ensure, under the most conservative source configuration, that risks are below significance thresholds. BAAQMD trigger thresholds are screening levels for TAC emissions from equipment; above those thresholds, dispersion modeling and further analyses are warranted. TAC emissions from equipment would not exceed BAAQMD trigger thresholds and thus would be less than BAAQMD's CEQA significance criteria for TACs.

- **Diesel-Fueled Generators:** Two existing generators (rated at 600 kilowatts [kW] and 250 kW, respectively) would be removed from the St. Luke's Hospital tower, two new 1,500-kW generators would be installed at the St. Luke's Replacement Hospital, and one new 250-kW generator would be installed at the St. Luke's MOB/Expansion Building. The years of manufacture for the existing generators are not known but are estimated to be sometime in the 1970s, which is when the existing hospital tower was originally constructed. The emission calculations are summarized in Table 4.7-11, "Diesel Particulate Emissions from Emergency Generators—St. Luke's Campus" (page 4.7-50). Despite the increase in the number of units and the higher power rating of the new generators, a net decrease in DPM emissions would occur at the St. Luke's Campus.

Table 4.7-11
Diesel Particulate Emissions from Emergency Generators—St. Luke's Campus

Status	Quantity	Equipment/Model	DPM (lb/yr)
To be removed	1	Generator, 250 kW (installed ~1969)	-9
To be removed	1	Generator, 600 kW (installed ~1969)	-20
Proposed	1	Generator, 250 kW (to be installed in 2018)	0.2
Proposed	2	Generators, Caterpillar, 1500 kW (to be installed by 2015)	13
Net change in emissions			**-15**

Notes: DPM = diesel particulate matter; lb/yr = pounds per year. Total does not add exactly because of rounding.
Source: Modeling provided by ENVIRON in 2010. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E

This decrease would be the result of stricter regulations on diesel emissions for new and future diesel generators compared to older generators. The applicable (1999) and recently adopted BAAQMD trigger thresholds would not be exceeded at the St. Luke's Campus because of the net decrease in DPM emissions.

In addition, according to the traffic study, the St. Luke's Campus would have fewer than 100 daily truck deliveries. Hence, the St. Luke's Campus would comply with ARB's recommendations to avoid siting sensitive receptors within 1,000 feet of a land use that accommodates more than 100 truck deliveries per day.[55]

Impact of Off-Site Sources on On-Site Receptors

As discussed previously for the Cathedral Hill Campus, all estimated acute noncancer HIs for on-site patients at the St. Luke's Campus associated with exposures to TAC emissions from stationary sources considered in this cumulative analysis would be well below the significance criterion of an HI of 1.

Overall, therefore, for the same reasons as described above for the proposed Cathedral Hill Campus, **this impact would be less than significant**.

St. Luke's Campus with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable (1999) BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for the St. Luke's Campus are expected to significantly change the construction or operations (including traffic) associated with the campuses. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For the St. Luke's Campus's project variants, for the same reasons as described previously, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the St. Luke's Campus in the near term.

Long-Term Projects

◆ Pacific Campus

Impact of Project Sources on Off-Site Receptors

At this time, no new generators or boilers are planned for Operations at Pacific Campus under the LRDP.

Following project implementation, the Pacific Campus could experience more than 100 truck deliveries per day, but not all trucks would be heavy-heavy-duty diesel trucks (i.e., the type of trucks associated with the commercial trucking operations, which were examined in ARB's *Air Quality and Land Use Handbook*). The fleet of trucks that would make trips to the Pacific Campus would also include light- and medium-duty trucks. A fleet distribution based on the traffic report was applied to the 283 daily delivery trips that would be made to the Pacific Campus, and the TAC emissions associated with Pacific Campus delivery vehicles would be equivalent to

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[55] Ibid.

approximately 41 heavy-heavy-duty diesel trucks.[56] Thus, the campus would comply with ARB's recommendations to avoid siting sensitive receptors within 1,000 feet of a land use that accommodates more than 100 truck deliveries per day.

Impact of Off-Site Sources on On-Site Receptors

As shown in Table 4.7-9, all estimated acute noncancer HIs for on-site patients at the Pacific Campus associated with exposures to TAC emissions from stationary sources considered in this cumulative analysis would be well below the significance criterion of an HI of 1.

Therefore, **the impact of operational emissions of TACs at the Pacific Campus would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific Campus in the long term.

◆ Davies Campus

Impact of Project Sources on Off-Site Receptors

No new stationary sources are proposed for the Davies Campus in the long term.

Impact of Off-Site Sources on On-Site Receptors

As shown in Table 4.7-9, all estimated acute noncancer HIs for on-site patients at the Davies Campus associated with exposures to TAC emissions from stationary sources considered in this cumulative analysis would be well below the significance criterion of an HI of 1.

Overall, for similar reasons as described above for the proposed Cathedral Hill Campus, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the long term.

[56] Ibid.

IMPACT AQ-6 *Construction and operation of the LRDP would not expose a substantial number of people to objectionable odors (1999 BAAQMD Guidelines). (Significance Criterion 7e)*

Levels of Significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: Less than significant*
- *Davies: Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

Odors from Construction

Construction of the Cathedral Hill, Davies, and St. Luke's Campuses in the near term is not anticipated to expose nearby on- and off-site receptors to objectionable odors. During construction activities, exhaust odors from diesel engines and emissions associated with the application of architectural coatings may be considered offensive to some individuals. However, because odors would be intermittent, temporary, and would disperse rapidly with distance from the source, construction-generated odors would not result in the exposure of a substantial number of receptors to objectionable odors. Furthermore, the project's compliance with Regulation 8 Rule 3[57] (Architectural Coatings) and Rule 15[58] (Emulsified Asphalt) would ensure that odors generated by short-term project construction would not affect a substantial number of people.

Odors from Operations

The screening-level distance identified by BAAQMD for major sources of odors is 1 mile from sensitive receptors (2 miles for petroleum refineries). No major sources of odors were identified within these screening-level distances from CPMC's proposed and existing campuses. Therefore, land use conflicts between major odor sources and the medical campuses (which, as indicated above in the discussion of Impact AQ-4, are considered sensitive receptors) would not be expected to occur. In addition, the LRDP does not propose creating a new major odor source.

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[57] Bay Area Air Quality Management District (BAAQMD), 2009, *Regulation 8 Organic Compounds, Rule 3, Architectural Coatings*, Available at: http://baaqmd.gov/~/media/Files/Planning%20and%20Research/Rules%20and%20Regs/reg%2008/rg0803.ashx, Accessed September 2009.

[58] Bay Area Air Quality Management District (BAAMQD), 1994, *Regulation 8 Organic Compounds, Rule 15 Emulsified and Liquid Asphalts*, Available at: http://baaqmd.gov/~/media/Files/Planning%20and%20Research/Rules%20and%20Regs/reg%2008/rg0815.ashx, Accessed September 2009.

Minor sources of odors, such as exhaust from mobile sources, garbage collection areas, and charbroilers associated with hospital cafeterias, are not typically associated with numerous odor complaints but are known to have some temporary, less concentrated odors. However, while the potential exists for odors to occur, the project's compliance with industry standard methods for waste disposal and BAAQMD Regulation 7 (Odorous Substances) would limit potential exposure to odors. In addition, any waste product from on-site operations with the potential to emit odors (e.g., trash enclosures) is anticipated to be disposed in proper containers and/or handled in a manner that would not emit any objectionable odors. Therefore, the LRDP would not expose a substantial number of people to objectionable odors. As a result, the impact would **be less than significant**.

For these reasons, **this impact would be less than significant** with respect to both major and minor sources of odor.

Cathedral Hill and St. Luke's Campuses with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable (1999) BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for Cathedral Hill and St. Luke's Campuses are expected to significantly change the construction or operations (including the number and duration of vehicle trips) associated with the campuses. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For both campuses' project variants, for the same reasons as described previously, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, or St. Luke's Campuses in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

This long-term impact would be similar to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. For the same reasons as discussed above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific or Davies Campuses in the long term.

IMPACT AQ-7

The LRDP's short-term construction emissions would not contribute to cumulatively considerable toxic air contaminant, criteria air pollutant or precursor emissions in the region. The LRDP's long-term operation criteria air pollutant emissions would contribute to a cumulative considerable impact, but its toxic air contaminant emissions would not be cumulatively considerable (1999 BAAQMD Guidelines). (Significance Criterion 7c)

Level of Significance (Criteria Air Pollutants):

- *Cathedral Hill (with or without project variants): Significant and Unavoidable (operational); Less than Significant (construction)*
- *Pacific: Significant and Unavoidable (operational); Less than Significant (construction)*
- *Davies: Significant and Unavoidable (operational); Less than Significant (construction)*
- *St. Luke's (with or without either project variant): Significant and Unavoidable (operational); Less than Significant (construction)*

Levels of Significance (Toxic Air Contaminants):

- *Cathedral Hill (with or without project variants): Less than significant (construction and operational)*
- *Pacific: Less than significant (construction and operational)*
- *Davies: Less than significant (construction and operational)*
- *St. Luke's (with or without either project variant): Less than significant (construction and operational)*

Implementation of the LRDP would result in short-term construction emissions and long-term operational emissions. The cumulative impacts associated with construction and operational activities are discussed separately below.

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

Construction-Generated Emissions of Criteria Air Pollutants and Precursors

Under the applicable (1999) BAAQMD CEQA Guidelines, construction emissions associated with the LRDP would be considered less than significant because the required construction-related control measures are included as Mitigation Measure M-AQ-1a and in the construction management plan, which is proposed as part of the project. Construction emissions are short-term and temporary. Following buildout of the LRDP, all construction emissions associated with the LRDP would cease. The LRDP would implement all necessary control measures from the applicable (1999) BAAQMD CEQA Guidelines as well as the Dust Control Ordinance to reduce construction emissions. Therefore, construction emissions associated with the LRDP would **not result in a cumulatively considerable impact** on air quality.

Construction-Related Exposure of Sensitive Receptors to TACs

As discussed in Impact AQ-2, construction activities associated with the LRDP would be temporary and would cease following completion of the LRDP. Therefore, construction-related TAC emissions would **not cause an incremental increase of TAC emissions in the region for a significant period that would cumulatively affect nearby sensitive receptors**.

Operational Emissions of Criteria Air Pollutants and Precursors

Project operations would cause a permanent net increase in criteria air pollutant and precursor emissions. The applicable (1999) *BAAQMD CEQA Guidelines* consider a project to result in a cumulatively considerable impact if operational criteria air pollutant and precursor emissions would exceed the project-level emissions thresholds of significance (i.e., 80 lbs/day of ROG, NO_X, or PM_{10}); hence, the project would cause a **cumulatively significant impact**.

Operational-Related Exposure of Sensitive Receptors to TACs

As shown in the evaluation for Impact AQ-5, operational TAC emissions at the Cathedral Hill, St. Luke’s, and Davies Campuses were all found to be less than significant regarding the single-source operational risk thresholds. As discussed above, this also means that no cumulatively considerable contributions to community risk would occur from these campuses. The LRDP would cause a slight increase of DPM emissions associated with delivery/service trucks. Although these emissions would be long-term TAC emissions, mobile-source TAC emissions would occur throughout the region and would not contribute a cumulatively considerable amount of TAC emissions at the project site that would be anticipated to cause an incremental increase in cancer risk above one in a million. Therefore, the project’s long-term operational activities would not generate a cumulatively considerable net increase of TAC emissions. Thus, **this impact would be less than significant**.

Cathedral Hill and St. Luke’s Campuses with Project Variants: As detailed in “Methodology for Assessing Impacts under CEQA and Applicable (1999) BAAQMD Significance Criteria” on page 4.7-26, none of the project variants for Cathedral Hill and St. Luke’s Campuses are expected to significantly change the construction or operations (including the number and duration of vehicle trips) associated with the campuses. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For both campuses' project variants, for the same reasons as described previously, **this impact would be less than significant**.

Long-Term Projects

◆ Pacific and Davies Campuses

The long-term impacts would be similar to the near-term impacts identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. For the same reasons as discussed above, **long-term projects would be cumulatively considerable for operational criteria air pollutant emissions, but would be less than significant for operational toxic air contaminant emissions and for construction emissions**.

IMPACT EVALUATIONS BASED ON RECENTLY ADOPTED BAAQMD SIGNIFICANCE CRITERIA FOR CRITERIA AIR POLLUTANTS AND TOXIC AIR CONTAMINANTS

Recently Adopted Significance Criteria

BAAQMD has updated its *CEQA Guidelines* and on June 2, 2010, formally adopted revised thresholds of significance. BAAQMD's recently adopted thresholds include quantitative thresholds of significance for evaluating construction-related and operational emissions of criteria pollutants and precursors, TACs, and GHGs (see Section 4.8, "Greenhouse Gas Emissions," of this EIR for a discussion of proposed thresholds for GHGs).[59] Differences between the 1999 and recently adopted thresholds include lower thresholds for emissions of operational ozone precursors (ROG and NO_X) and $PM_{2.5}$.

According to BAAQMD, the recently adopted thresholds of significance for criteria air pollutants, GHGs, and health risks from new sources are intended to apply to environmental analyses that have begun on or after adoption of the revised CEQA thresholds. Thresholds pertaining to the health risk impacts of sources on sensitive receptors are intended to apply to environmental analyses begun on or after January 1, 2011. Therefore, the proposed project would be subject to the thresholds identified in BAAQMD's 1999 CEQA Guidelines. At the time of writing this EIR (and at the time the notice of preparation of this EIR was released for the CPMC LRDP), the 1999 *BAAQMD CEQA Guidelines*' thresholds of significance[60] were still the applicable and effective thresholds. Therefore, all significance conclusions previously provided in this analysis of air quality impacts are based on the 1999 *BAAQMD CEQA Guidelines*. However, pursuant to the recently adopted significance thresholds (June 2, 2010), implementation of the proposed project would have a significant effect on air quality if:

[59] Bay Area Air Quality Management District. 2010 (June). *California Environmental Quality Act Air Quality Guidelines*, op. cit.

[60] Bay Area Air Quality Management District. 1999. *BAAQMD CEQA Guidelines*, op. cit.

- average daily construction emissions would exceed 54 lb/day of ROG, NO_X, or $PM_{2.5}$, or 82 lb/day of PM_{10}, whereby the thresholds for PM_{10} and $PM_{2.5}$ apply to exhaust emissions only;
- applicable (1999) BAAQMD-recommended Basic Construction Mitigation Measures are not implemented during construction activities;
- operational emissions would exceed 54 lb/day or 10 TPY of ROG, NO_X, or $PM_{2.5}$, or 82 lb/day or 15 TPY of PM_{10};
- the proposed residents would be exposed to, or if the project's construction or operation would cause, an excess cancer risk level exceeding 10 in 1 million or a hazard index greater than 1.0 at the MEI; or
- the project's construction or operational activities would generate annual $PM_{2.5}$ concentrations that exceed 0.3 micrograms per cubic meter ($\mu g/m^3$).
- For cumulative criteria air pollutants, BAAQMD considers a project that result in a significant project-level impact to also result in a significant cumulative CAP impact.
- For cumulative risks and hazards, BAAQMD is proposing that implementation of the proposed project would contribute to a cumulatively considerable health risk impact on air quality if it would result in:
  - an excess cancer risk level of more than 100 in 1 million or a noncancer (i.e., chronic or acute) hazard index greater than 10 from all local sources within 1,000 foot zone of influence; or
  - a concentration greater than 0.8 $\mu g/m^3$ annual average $PM_{2.5}$ from all local sources within 1,000 foot zone of influence.

Methodology for Assessing Impacts under Recently Adopted BAAQMD Significance Criteria

The recently adopted *Air Quality Guidelines* acknowledge that construction-related TAC emissions are temporary. In addition, DPM emissions are typically reduced by 70% at approximately 500 feet from the source.[61] Furthermore, health risk assessments conducted for construction activities that would occur for shorter periods than the currently established methodologies for conducting health risk assessments (i.e., 9-, 40- and 70-year exposure periods) could result in difficulties with producing accurate estimates of health risks. Nevertheless, for the purposes of this analysis, and in anticipation of possible adoption of revised thresholds of significance,

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[61] California Air Resources Board (ARB). 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*, Sacramento, CA, Available: http://www.arb.ca.gov/ch/landuse.htm, Accessed December 2010.

ENVIRON performed a health risk assessment and $PM_{2.5}$ analysis for the project's construction activities.[62] See "Methodology for Assessing Impacts under Recently Adopted BAAQMD Significance Criteria," subsection "Health Risk Assessment" on page 4.7-26, for further details on this methodology.

As recommended in the June 2010 CEQA guidelines, cancer risks for a resident child are adjusted using the age-sensitivity factor (ASF) approach described in the OEHHA Technical Support Document (TSD) and the population-specific ASFs recommended by BAAQMD.[63] The document proposes the use of ASFs to account for an "anticipated sensitivity to carcinogens" of infants and children. Under the revised approach, cancer risk estimates are weighted (using ASFs) by a factor of 10 for exposures that occur from the third trimester of pregnancy to 2 years of age and by a factor of 3 for exposures that occur from 2 years through 15 years of age. No weighting factor (i.e., an ASF of 1, which is equivalent to no adjustment) is applied to ages 16 to 70 years.

IMPACT AQ-8

Construction activities associated with the LRDP would not result in short-term increases in fugitive dust that exceed the recently adopted (June 2, 2010) BAAQMD CEQA significance criteria. (Significance Criteria 7a and 7b)

Levels of Significance:

- *Cathedral Hill (with or without project variants): Less than significant with mitigation*
- *Pacific: Less than significant with mitigation*
- *Davies: Less than significant with mitigation*
- *St. Luke's (with or without either project variant): Less than significant with mitigation*

BAAQMD's recently adopted *Air Quality Guidelines* (June 2, 2010) recommend that all projects implement a list of Basic Construction Mitigation Measures during construction activities whether or not construction-related emissions exceed the recently adopted thresholds of significance. In addition to the Basic and Optional Control Measures included in the 1999 guidelines, some measures have been added that involve vehicle idling time limits and equipment maintenance requirements. The impact described below is based on these modifications to BAAQMD significance criteria.

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62 Modeling performed by ENVIRON in 2010. Refer to ENVIRON memo dated May 26, 2010 entitled "CPMC Construction Risk Analysis". This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

63 BAAQMD Air Toxics New Source Review (NSR) Program Health Risk Screening Analysis (HRSA) Guidelines (BAAQMD 2010).

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

The near-term impact related to generation of fugitive dust during construction activities associated with the LRDP is identical to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses under Impact AQ-1. For the same reasons as discussed in Impact AQ-1 for applicable (1999) BAAQMD significance criteria, with implementation of Mitigation Measures M-AQ-N8a and M-AQ-N8b (described below) the impact of fugitive dust from construction activities **would be less than significant under the recently adopted BAAQMD CEQA significance criteria**.

Cathedral Hill and St. Luke's Campuses with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable (1999) BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for Cathedral Hill and St. Luke's Campuses are expected to significantly change the construction or operations (including the number and duration of vehicle trips) associated with the campuses. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. The impact related to fugitive dust generation during LRDP construction activities with implementation of any of the project variants would be identical to the impact described under Impact AQ-1 for applicable (1999) BAAQMD significance criteria. For the same reasons as discussed above, **this impact would be less than significant with mitigation under the recently adopted BAAQMD CEQA significance criteria**.

Mitigation Measures for Cathedral Hill, Davies, and St. Luke's Campuses

M-AQ-N8a: Implement BAAQMD Basic and Optional Control Measures and Additional Construction Mitigation Measures during Construction

This mitigation measure is identical to Mitigation Measure M-AQ-N1a for Impact AQ-1 (see page 4.7-31).

M-AQ-N8b: Implement Equipment Exhaust Control Measures during Construction

This mitigation measure is identical to Mitigation Measure M-AQ-N1b for Impact AQ-1 (see page 4.7-32).

BAAQMD's applicable dust control measures (i.e., Basic and Optional Control Measures) and recently adopted Basic Construction Mitigation Measures are included as part of Mitigation Measures M-AQ-N8a and M-AQ-N8b. **Implementation of Mitigation Measures M-AQ-N8a and M-AQ-N8b would reduce the impact of fugitive dust emissions from construction of near-term projects to a less-than-significant level under the recently adopted BAAQMD CEQA significance criteria**.

Long-Term Projects

◆ Pacific and Davies Campuses

This long-term impact is identical to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. For the same reasons as discussed above, **this impact would be significant under the recently adopted BAAQMD CEQA significance criteria**.

Mitigation Measures for the Pacific Campus and Davies Campus

M-AQ-L8a: Implement BAAQMD Basic and Optional Control Measures and Additional Construction Mitigation Measures during Construction

This mitigation measure is identical to M-AQ-N1a for Impact AQ-1 (see page 4.7-31).

M-AQ-L8b: Implement Equipment Exhaust Control Measures during Construction

This mitigation measure is identical to Mitigation Measure M-AQ-N1b for Impact AQ-1 (see page 4.7-32).

BAAQMD's dust control measures from the 1999 guidelines (i.e., Basic and Optional Control Measures) and Basic Construction Mitigation Measures from the recently adopted (June 2010) guidelines are included in the project's construction management plan as part of the proposed project, and as part of Mitigation Measures M-AQ-L8a and M-AQ-L8b. **Implementation of Mitigation Measures M-AQ-L8a and M-AQ-L8b would reduce the impact of fugitive dust emissions from construction of long-term projects to a less-than-significant level under the recently adopted BAAQMD CEQA significance criteria**.

IMPACT AQ-9 *Near-term and long-term construction activities associated with the LRDP would exceed recently adopted (June 2, 2010) BAAQMD CEQA significance thresholds for mass criteria pollutant emissions and would contribute to an existing or projected air quality violation. (Significance Criteria 7b and 7c)*

Levels of Significance:

- *Cathedral Hill (with or without project variants): Significant and unavoidable with mitigation*
- *Pacific: Significant and unavoidable with mitigation*
- *Davies: Significant and unavoidable with mitigation*
- *St. Luke's (with or without either project variant): Significant and unavoidable with mitigation*

The recently adopted BAAQMD thresholds include mass emission limits for ROG, NO_X, PM_{10} (exhaust), and $PM_{2.5}$ (exhaust) during construction. The 1999 thresholds do not include quantitative thresholds for construction activities. Construction-related emissions of criteria air pollutants (e.g., PM_{10} and $PM_{2.5}$) and precursors (e.g., ROG and NO_X) were modeled and assessed using emissions factors and methodologies recommended by ARB and BAAQMD and are described in more detail under "Methodology" on page 4.7-26 of this chapter. The impact described below is based on the modifications to BAAQMD significance criteria.

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

Table 4.7-12, "Near-Term Modeled Average Daily Emissions of Criteria Air Pollutants and Precursors Associated with Construction under the LRDP" (page 4.7-63), summarizes the average daily emissions of criteria air pollutants (i.e., PM_{10} and $PM_{2.5}$) and precursors (i.e., ROG and NO_X) that would be generated during the construction period for near-term projects. It is important to note that nominal levels of SO_2 and CO would also be emitted during these activities. The quantities of SO_2 generated during construction activities would be minimal because construction equipment would use ultra-low sulfur diesel fuel (15 ppm sulfur content by weight). In 1998, the SFBAAB was redesignated as attainment for CO under the NAAQS and is currently designated as attainment under the CAAQS. CO is not considered a pollutant of regional concern because of the newer emissions technology and vehicle fleet turnover. Instead, BAAQMD focuses on localized concentrations of CO. In addition, construction-related CO emissions are considered to be accounted for in the emissions inventory for

Table 4.7-12
Near-Term Modeled Average Daily Emissions of Criteria Air Pollutants and Precursors Associated with Construction under the LRDP

Activity	Emissions (lb/day)[a]			
	ROG	NO_X	PM_{10}[b]	$PM_{2.5}$[b]
Cathedral Hill Campus				
Off-road equipment	33	224	12	12
Asphalt paving	0.04	–	–	–
Application of architectural coatings	1.2	–	–	–
Worker commuting	3.0	7.8	0.7	0.7
On-road truck hauling	1.2	29	1.2	1.2
Cathedral Hill Campus Total [c]	**38**	**261**	**14**	**14**
Davies Campus				
Off-road equipment	4.1	24	1.5	1.5
Asphalt paving	–	–	–	–
Application of architectural coatings	0.05	–	–	–
Worker commuting	0.2	0.6	0.04	0.04
On-road truck hauling	0.5	13	0.6	0.6
Davies Campus Total [c]	**5**	**38**	**2**	**2**
St. Luke's Campus				
Off-road equipment	2.8	18	1.1	1.1
Asphalt paving	0.006	–	–	–
Application of architectural coatings	0.2	–	–	–
Worker commuting	0.5	1.3	0.1	0.1
On-road truck hauling	0.3	5.6	0.2	0.2
St. Luke's Campus Total [c]	**4**	**25**	**1**	**1**
Total average daily emissions, all campuses (2011–2015)[d]	47	324	17	17
Recently adopted BAAQMD significance criterion	54 lb/day	54 lb/day	82 lb/day[e]	54 lb/day[e]

Notes: BAAQMD = Bay Area Air Quality Management District; lb/day = pounds per day; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; ROG = reactive organic gases.

[a] Emissions were calculated to account for regulations passed by the California Air Resources Board since the time the model was developed. Implementing these regulations would result in a cleaner construction equipment fleet and lower associated emissions factors than were assumed in the default modeling scenario. These estimates are considered reasonably foreseeable.

[b] For a conservative estimate, all particulate matter exhaust emissions were assumed to be $PM_{2.5}$, which is a subset of PM_{10}. Therefore, all particulate matter exhaust emissions are also considered PM_{10}.

[c] Average daily emissions were calculated by dividing the total near-term emissions for each campus by the total number of construction days in the near-term period.

[d] "All campuses" for 2011–2015 refers to all three CPMC campuses with near-term projects. Total average daily emissions values represent the sum of the average daily emissions for each campus.

[e] These criteria apply to exhaust emissions only.

Source: Modeling performed by ENVIRON in 2010. Refer to ENVIRON memo dated March 12, 2010 entitled "CPMC Revised Construction Emission Estimates." This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E regional air quality plans and are not anticipated to impede attainment or maintenance of the CO standard.[64] For these reasons and because control of SO_2 and CO emissions from construction activities is not required to achieve attainment, no significance thresholds for CO or SO_2 emissions from construction activities were contained in BAAQMD's recently adopted CEQA significance thresholds; therefore, emissions of CO and SO_2 are not shown in Table 4.7-12, "Near-Term Modeled Average Daily Emissions of Criteria Air Pollutants and Precursors Associated with Construction under the LRDP."[65]

Emissions associated with near-term campus construction under the LRDP would exceed the recently adopted BAAQMD significance criteria for construction-related NO_X. As a result, **this impact would be significant under the recently adopted BAAQMD CEQA significance criteria**.

Cathedral Hill and St. Luke's Campuses with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable (1999) BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for Cathedral Hill and St. Luke's Campuses are expected to significantly change the construction or operations (including the number and duration of vehicle trips) associated with the campuses. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For both campuses, for the same reasons as described previously, **this impact would be significant under the recently adopted BAAQMD CEQA significance criteria**.

M-AQ-N9 Implement Construction Mitigation under Recently Adopted Thresholds of Significance.

CPMC shall implement Mitigation Measure M-AQ-N1a, "Implement BAAQMD Basic and Optional Control Measures and Additional Construction Mitigation Measures during Construction," discussed under Impact AQ-1 (page 4.7-31), and Mitigation Measure M-AQ-N2, "Install Accelerated Emission Control Device on Construction Equipment," discussed under Impact AQ-2 (page 4.7-35), to reduce emissions of criteria pollutants from construction equipment exhaust.

Even with implementation of the mitigation described above, the criteria pollutant emissions from construction equipment sources are predicted to remain above the recently adopted significance thresholds. Hence, the impact associated with criteria pollutant emissions from long-term construction would remain **significant and unavoidable under the recently adopted BAAQMD CEQA significance criteria**.

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[64] Bay Area Air Quality Management District. 1999 (December). *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Project and Plans*. Page 13.

[65] Bay Area Air Quality Management District. 2009 (October). *Revised Draft Options and Justification Report, California Environmental Quality Act Thresholds of Significance*, Available: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Revised%20Draft%20CEQA%20Thresholds%20%20Justification%20Report%20Oct%202009.ashx. Page 2.

Long-Term Projects

◆ Pacific and Davies Campuses

Table 4.7-13, "Long-Term Modeled Average Daily Emissions of Criteria Air Pollutants and Precursors Associated with Construction under the LRDP," summarizes the average daily emissions of criteria air pollutants (i.e., PM_{10} and $PM_{2.5}$) and precursors (i.e., ROG and NO_X) that would be generated during the construction period for long-term projects.

Emissions associated with long-term campus construction under the LRDP would exceed the recently adopted BAAQMD significance criteria for construction-related NO_X. Implementation of long-term projects under the LRDP could result in or substantially contribute to an air quality violation for NO_X. As a result, **this impact would be significant under the recently adopted BAAQMD CEQA significance criteria**.

M-AQ-L9 Implement Construction Mitigation under Recently Adopted BAAQMD Thresholds of Significance

This potential mitigation measure is identical to potential Mitigation Measure M-AQ-N9, above.

Even with implementation of the mitigation described above, the criteria pollutant emissions from construction equipment sources are predicted to remain above the recently adopted significance thresholds. Hence, the impact associated with criteria pollutant emissions from long-term construction would remain **significant and unavoidable under the recently adopted BAAQMD CEQA significance criteria**.

IMPACT AQ-10 *Construction activities associated with the LRDP would result in short-term increases in emissions of diesel particulate matter that exceed the recently adopted (June 2, 2010) BAAQMD CEQA significance criteria and expose sensitive receptors to substantial concentrations of toxic air contaminants and $PM_{2.5}$. (Significance Criteria 7b and 7d)*

Levels of Significance:

- *Cathedral Hill (with or without project variants): Significant and unavoidable with mitigation*
- *Pacific: Significant and unavoidable with mitigation*
- *Davies: Significant and unavoidable with mitigation*
- *St. Luke's (with or without either project variant): Significant and unavoidable with mitigation*

Table 4.7-13
Long-Term Modeled Average Daily Emissions of Criteria Air Pollutants and Precursors Associated with Construction under the LRDP

Activity	Emissions (lb/day)[a]			
	ROG	NO_X	PM_{10}[b]	$PM_{2.5}$[b]
Pacific Campus				
Off-road equipment	14	76	2.8	2.8
Asphalt paving	–	–	–	–
Application of architectural coatings	0.8	–	–	–
Worker commuting	0.9	2.6	0.3	0.3
On-road truck hauling	0.4	5.5	0.2	0.2
Pacific Campus Total [c]	**16**	**84**	**3**	**3**
Davies Campus				
Off-road equipment	3.0	17	0.6	0.6
Asphalt paving	–	–	–	–
Application of architectural coatings	0.2	–	–	–
Worker commuting	0.1	0.4	0.06	0.06
On-road truck hauling	0.06	0.6	0.02	0.02
Davies Campus Total [c]	**3**	**18**	**1**	**1**
Total average daily emissions, all campuses (2015 and beyond)[a, d]	19	102	4	4
Recently adopted BAAQMD significance criterion	54 lb/day	54 lb/day	82 lb/day [e]	54 lb/day [e]

Notes: BAAQMD = Bay Area Air Quality Management District; lb/day = pounds per day; MOB = medical office building; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; ROG = reactive organic gases.

[a] Emissions were calculated to account for regulations passed by the California Air Resources Board since the time the model was developed. Implementing these regulations would result in a cleaner construction equipment fleet and lower associated emission factors than were assumed in the default modeling scenario. These estimates are considered reasonably foreseeable.

[b] For a conservative estimate, all particulate matter exhaust emissions were assumed to be $PM_{2.5}$, which is a subset of PM_{10}. Therefore, all particulate matter exhaust emissions are also considered PM_{10}.

[c] Average daily emissions were calculated by dividing the total long-term emissions for each campus by the total number of construction days in the long-term period.

[d] "All campuses" for 2015 and beyond refers to both CPMC campuses with long-term projects: Pacific Campus and Davies Campus.

[e] These criteria apply to exhaust emissions only.

Source: Modeling performed by ENVIRON in 2010. Refer to ENVIRON memo dated March 12, 2010 entitled "CPMC Revised Construction Emission Estimates". This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E

Modifications to BAAQMD Significance Criteria

BAAQMD's Air *Quality Guidelines* recommend that projects quantitatively evaluate the TAC and $PM_{2.5}$ emissions associated with construction activities. The primary construction-related TAC of concern is DPM from heavy-duty construction equipment operating on-site. If construction activities would result in an increase in cancer risk above 10 in 1 million or an increased noncancer hazard index greater than 1.0, the project's construction-related TAC emissions would be significant. In addition, if construction-related exhaust emissions would cause an incremental increase of annual $PM_{2.5}$ concentrations greater than 0.3 μg/m^3, the project's construction-related $PM_{2.5}$ emissions would also be significant. The impact described below is based on these modifications to BAAQMD significance criteria.

Impact Evaluation Based on Recently Adopted BAAQMD Thresholds

Because health risk impacts are localized, the risks associated with construction activities were evaluated for each campus separately and were evaluated using the recently adopted BAAQMD significance criteria (Table 4.7-14, "Screening-Level Analysis of Health Risks from Construction Emissions for All Campuses under Recently Adopted BAAQMD Significance Criteria," page 4.7-67).

Table 4.7-14
Screening-Level Analysis of Health Risks from Construction Emissions for All Campuses under Recently Adopted BAAQMD Significance Criteria

Campus	Estimated Excess Cancer Risk at MEIR – Adult Exposure Parameters[1]	Estimated Excess Cancer Risk at MEIR – Child Exposure Parameters[1]	Annual Average $PM_{2.5}$ Concentration at MEIR
Cathedral Hill	9	111	0.4
Davies Neuroscience Institute	1	20	0.1
Davies Castro Street/14th Street MOB	0	7	0.1
Pacific	2	23	0.1
St. Luke's Hospital	2	29	0.1
St. Luke's MOB	1	13	0.1
BAAQMD Threshold	10	10	0.3

Notes: BAAQMD = Bay Area Air Quality Management District; MEIR = maximally exposed individual receptor; MOB = medical office building.
[1] Cancer risks for a resident child were adjusted using the age-sensitivity factor (ASF) approach described in the OEHHA Technical Support Document (TSD) and the population-specific ASFs recommended by BAAQMD. For this assessment, it was conservatively assumed that the child exposure period begins when a child is in its 3rd trimester in utero. For example, at the proposed Cathedral Hill Campus, where the overall construction duration is 4.7 years, an ASF of 10 for 2.25 years and an ASF of 3 was assumed for the balance of the construction period. No ASFs were applied for the adult resident risk.
Source: ENVIRON memo dated May 26, 2010 entitled "CPMC Construction Risk Analysis." This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E

Near-Term Projects

◆ Cathedral Hill Campus

The results of the risk analysis for the MEI (i.e., resident child) are summarized in Table 4.7-14, "Summary of Screening-Level Analysis of Risk from Construction Emissions for All Campuses under Recently Adopted BAAQMD Significance Criteria" (page 4.7-67). According to the analysis, the near-term TAC emissions from construction at the Cathedral Hill Campus would generate a cancer risk of approximately 111 in a million at the maximally exposed off-site individual, assuming the receptor is a resident child (the estimated cancer risk is 9 in a million assuming the receptor is a resident adult). Furthermore, the incremental increase in annual $PM_{2.5}$ is 0.4 $\mu g/m^3$. These levels exceed the threshold of 10 in a million (in the case of the resident child) and 0.3 ug/m^3, respectively. These results reflect a conservative, screening-level estimate; additional, more refined modeling would better characterize risk associated with construction at Cathedral Hill Campus and would result in smaller impacts. However, based on the screening-level evaluation, the near-term TAC and $PM_{2.5}$ emissions from construction would be considered potentially significant under the recently adopted *BAAQMD CEQA Thresholds*. Because of the scale of the construction activities and proximity to adjacent receptors, the impacts would be potentially above BAAQMD's significance threshold and thus **could be potentially significant under the recently adopted BAAQMD CEQA significance criteria**.

Cathedral Hill Campus with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for Cathedral Hill Campus are expected to significantly change the construction or operations (including the number and duration of vehicle trips) associated with the campus. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For the Cathedral Hill Campus's project variants, for the same reasons as described previously, **this impact would be significant under the recently adopted BAAQMD CEQA significance criteria**.

Mitigation Measures for Cathedral Hill Campus (Near Term)

M-AQ-N10a Install Accelerated Emission Control Device on Construction Equipment

This mitigation measure is identical to Mitigation Measure M-AQ-N2 for Impact AQ-2 (see page 4.7-35).

While it is possible that Mitigation Measure M-AQ-N10a could reduce the carcinogenic risk and chronic noncarcinogenic health hazards posed by DPM emissions below the thresholds, it is unknown at this time to what extent such equipment will be available at the time of construction. In light of this uncertainty, **Impact AQ-10 would remain significant and unavoidable**.

Davies Campus

According to the risk analysis summarized in Table 4.7-14, “Summary of Screening-Level Analysis of Risk from Construction Emissions for All Campuses under Recently Adopted BAAQMD Significance Criteria” (page 4.7-67), the construction-related TAC emissions that would result from development of the proposed Neuroscience Institute at the Davies Campus would generate a cancer risk of approximately 20 in a million at the off-site MEI, assuming the receptor is a resident child. This level exceeds the threshold of 10 in a million. These results reflect a conservative, screening-level estimate; additional, more refined modeling would better characterize risk associated with construction at the Davies Campus and would result in smaller impacts. The screening-level evaluation shows that this impact would be **significant under the recently adopted BAAQMD CEQA significance criteria**.

Mitigation Measures for Davies Campus (Near Term)

M-AQ-N10b Install Accelerated Emission Control Device on Construction Equipment

This mitigation measure is identical to Mitigation Measure M-AQ-N2 for Impact AQ-2 (see page 4.7-35).

While it is possible that Mitigation Measure M-AQ-N10b could reduce the carcinogenic risk and chronic noncarcinogenic health hazards posed by DPM emissions below the thresholds, it is unknown at this time to what extent such equipment will be available at the time of construction. In light of this uncertainty, **Impact AQ-10 would remain significant and unavoidable.**

St. Luke’s Campus

Because the same group of receptors will be impacted by both the hospital and the MOB construction projects at St. Luke’s Campus, the risk estimates for both projects should be considered cumulatively. A conservative estimate of overall risk from construction for these receptors would be the sum of the risks calculated for each construction project. According to the risk analysis summarized in Table 4.7-14, “Summary of Screening-Level Analysis of Risk from Construction Emissions for All Campuses under Recently Adopted BAAQMD Significance Criteria” (page 4.7-67), the near-term TAC emissions from construction at the St. Luke’s Campus would generate a cancer risk of approximately 43 in a million at the off-site MEI, assuming the receptor is a resident child. This level exceeds the threshold of 10 in a million. These results reflect a conservative, screening-level estimate; additional, more refined modeling would better characterize risk associated with construction at St. Luke’s Campus and would result in smaller impacts. The screening-level evaluation shows that **this impact would be significant under the recently adopted BAAQMD CEQA significance criteria**.

St. Luke's Campus with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for the St. Luke's Campus are expected to significantly change the construction or operations (including traffic) associated with the campuses. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For the St. Luke's Campus's project variants, for the same reasons as described previously, **this impact would be significant under the recently adopted BAAQMD CEQA significance criteria**.

Mitigation Measures for St. Luke's Campus (Near Term)

M-AQ-N10c Install Accelerated Emission Control Device on Construction Equipment

This mitigation measure is identical to Mitigation Measure M-AQ-N2 for Impact AQ-2 (see page 4.7-35).

While it is possible that Mitigation Measure M-AQ-N10c could reduce the carcinogenic risk and chronic noncarcinogenic health hazards posed by DPM emissions below the thresholds, it is unknown at this time to what extent such equipment will be available at the time of construction. In light of this uncertainty, **Impact AQ-10 would remain significant and unavoidable.**

Long-Term Projects

◆ Pacific Campus

According to the risk analysis summarized in Table 4.7-14, "Summary of Screening-Level Analysis of Risk from Construction Emissions for All Campuses under Recently Adopted BAAQMD Significance Criteria" (page 4.7-67), the long-term TAC emissions from construction at the Pacific Campus would generate a cancer risk of approximately 23 in a million at the off-site MEI, assuming the receptor is a resident child. This level exceeds the threshold of 10 in a million. These results reflect a conservative, screening-level estimate; additional, more refined modeling would better characterize risk associated with construction at the Pacific Campus and would result in smaller impacts. The screening-level evaluation shows that **this impact would be significant under the recently adopted BAAQMD CEQA significance criteria**.

Mitigation Measures for Pacific Campus (Long Term)

M-AQ-L10 Install Accelerated Emission Control Device on Construction Equipment

This mitigation measure is identical to Mitigation Measure M-AQ-N2 for Impact AQ-2 (see page 4.7-35).

While it is possible that Mitigation Measure M-AQ-L10 could reduce the carcinogenic risk and chronic noncarcinogenic health hazards posed by DPM emissions below the thresholds, it is unknown at this time to what extent such equipment will be available at the time of construction. In light of this uncertainty, **Impact AQ-10 would remain significant and unavoidable.**

Davies Campus

Because the same group of receptors will be impacted by both near-term and long-term construction projects at Davies Campus, the risk estimates for both projects should be considered cumulatively. A conservative estimate of overall risk from construction for these receptors would be the sum of the risks calculated for each construction project. According to the risk analysis summarized in Table 4.7-14, "Summary of Screening-Level Analysis of Risk from Construction Emissions for All Campuses under Recently Adopted BAAQMD Significance Criteria" (page 4.7-67), the construction-related TAC emissions that would result from development of the proposed Neuroscience Institute building and Castro Street/14th Street MOB at the Davies Campus would generate a cancer risk of approximately 27 in a million at the off-site MEI, assuming the receptor is a resident child. These results reflect a conservative, screening-level estimate; additional, more refined modeling would better characterize risk associated with construction at the Davies Campus and would result in smaller impacts. The screening-level evaluation shows that this impact would be **significant under the recently adopted BAAQMD CEQA significance criteria**.

Mitigation Measure for Davies Campus (Long Term)

M-AQ-L10 Install Accelerated Emission Control Device on Construction Equipment

This mitigation measure is identical to Mitigation Measure M-AQ-N2 for Impact AQ-2 (see page 4.7-35).

While it is possible that Mitigation Measure M-AQ-L10 could reduce the carcinogenic risk and chronic noncarcinogenic health hazards posed by DPM emissions below the thresholds, it is unknown at this time to what extent such equipment will be available at the time of construction. In light of this uncertainty, **Impact AQ-10 would remain significant and unavoidable**.

IMPACT AQ-11

Operation of the LRDP would exceed the recently adopted (June 2, 2010) BAAQMD CEQA significance thresholds for mass criteria pollutant emissions and would contribute to an existing or projected air quality violation at full buildout. (Significance Criteria 7a and 7c)

Levels of Significance:

- *Cathedral Hill (with or without project variants): Significant and unavoidable*
- *Pacific: Significant and unavoidable*
- *Davies: Significant and unavoidable*
- *St. Luke's (with or without either project variant): Significant and unavoidable*

Modifications to BAAQMD Significance Criteria

The recently adopted BAAQMD thresholds of significance are lower for ROG and NO_X and slightly higher for PM_{10}. The recently adopted BAAQMD thresholds of significance also include a new threshold for $PM_{2.5}$. The impact described below is based on these modifications to BAAQMD significance criteria.

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

Based on the emissions summary shown previously in Table 4.7-6, "Emissions of Criteria Air Pollutants and Precursors Attributable to Operations under the LRDP—Modeled Daily Net Changes from Existing Conditions" (page 4.7-39), and Table 4.7-7, "Emissions of Criteria Air Pollutants and Precursors Attributable to Operation of Long-Term Projects under the LRDP—Modeled Annual Net Changes from Existing Conditions" (page 4.7-40), both under Impact AQ-3, the net change in operational PM_{10} emissions (119 pounds/day; 22 tons/year) from implementation of projects under the CPMC LRDP would exceed BAAQMD's daily and annual emission significance criteria for PM_{10} (82 pounds/day, 15 tons/year). Therefore, operation of proposed LRDP projects would result in or contribute to a violation of PM_{10} air quality standards. No feasible mitigation is available to reduce this impact to a less-than-significant level. Therefore, **this impact would be significant and unavoidable under the recently adopted BAAQMD CEQA significance criteria**.

Cathedral Hill and St. Luke's Campuses with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for Cathedral Hill and St. Luke's Campuses are expected to significantly change the construction or operations (including the number and duration of vehicle trips) associated with the campuses. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For both campuses' project variants, for the same reasons as described previously, **this impact would be significant and unavoidable under the recently adopted BAAQMD CEQA significance criteria**.

Long-Term Projects

◆ Pacific and Davies Campuses

This long-term impact would be similar to the near-term impact identified above. For the same reasons as discussed above, **this impact would be significant and unavoidable under the recently adopted BAAQMD CEQA significance criteria**.

IMPACT AQ-12

Operation of CPMC campuses under the LRDP would not expose sensitive receptors to substantial concentrations of toxic air contaminants (Recently adopted BAAQMD Guidelines). (Significance Criterion 7d)

Levels of Significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: Less than significant*
- *Davies: Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Modifications to BAAQMD Significance Criteria

The recently adopted CEQA thresholds recommend an additional a $PM_{2.5}$ incremental concentration threshold of 0.3 $\mu g/m^3$ to evaluate risks and hazards from single stationary sources. The impact described below is based on these modifications to BAAQMD significance criteria.

Impact Evaluation Based on Recently Adopted BAAQMD Thresholds

The following impact evaluations involve estimating the maximum incremental increases in $PM_{2.5}$ concentrations within 1,000 feet of the campus boundaries, and comparing them to the recently adopted threshold. Screening-level modeling was performed for two types of $PM_{2.5}$ emission sources: stationary sources (i.e., diesel generators and natural gas boilers) and mobile sources. In addition, it should be noted that to comply with state hospital construction standards, the proposed LRDP facilities would include a mechanical ventilation system with intake air filtered for particulates. Intake air would be expected to be filtered using 85% efficiency filters, which would effectively remove most ambient sources of respirable particulates from indoor environments at the proposed hospital.

Near-Term Projects

◆ Cathedral Hill Campus

- **$PM_{2.5}$ from diesel generators**: Impact AQ-5 presented screening-level air dispersion modeling for emissions from four emergency diesel generators at the Cathedral Hill Campus, which estimated a maximum DPM (using $PM_{2.5}$) incremental concentration of 0.02 μg/m^3.

- **$PM_{2.5}$ from natural gas boilers**: Several new natural gas boilers will be installed at the Cathedral Hill Campus. Screening-level air dispersion modeling was performed to estimate the incremental increase in ambient $PM_{2.5}$ concentrations associated with natural gas boiler emissions. To perform this analysis, a SCREEN3 air dispersion model was run using all its combinations of meteorological conditions to determine the worst-case maximum downwind 1-hour average dispersion factor for particulate emissions from the new Cathedral Hill boilers.[66] Because multilevel buildings are located near the proposed new boilers, multiple receptor heights from ground level up to 60 meters were used during the screening modeling. Results of the screening evaluation are summarized in Table 4.7-15, "Screening Evaluation of Incremental $PM_{2.5}$ Concentrations from Proposed Boiler Emissions—Cathedral Hill Campus" (page 4.7-74). According to the results of the screening evaluation, the incremental risk associated with the $PM_{2.5}$ emissions from the proposed new boilers at the Cathedral Hill Campus would be approximately 0.01 μg/m^3.

Table 4.7-15
Screening Evaluation of Incremental $PM_{2.5}$ Concentrations from Proposed Boiler Emissions—Cathedral Hill Campus

Receptor Height (meters)	Incremental $PM_{2.5}$ Concentration (μg/m^3)
0	0.01
20	0.01
60	0.01

Source: Modeling provided by ENVIRON in 2010. This information is on file with the San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E

[66] On November 9, 2005, the USEPA promulgated final revisions to the federal *Guideline on Air Quality Models*, in which they recommended that AERMOD be used for dispersion modeling evaluations of criteria air pollutant and toxic air pollutant emissions from typical industrial facilities. A one-year transition period commenced from the proposed effective date of December 9, 2005. Although that one year transition period has elapsed, the BAAQMD continues to recommend using ISCST3, in addition to AERMOD, for these types of evaluations (see http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_June%202010.ashx). Furthermore, due to the lack of representative meteorological data collected in downtown San Francisco, screening meteorological data was used; the screening version of AERMOD (AERSCREEN) is still undergoing development and is not currently available.

- **$PM_{2.5}$ from project-generated traffic**: The impact of project-generated traffic $PM_{2.5}$ on ambient concentrations can be evaluated relative to the impact of existing roadway source impacts. Existing $PM_{2.5}$ concentration levels associated with high-volume roadways in the vicinity of the proposed Cathedral Hill Campus were evaluated using the EPA-approved model CAL3QHCR by the San Francisco Department of Public Health (SFDPH). CAL3QHCR can estimate pollutant concentration levels using user-provided meteorological data, traffic volumes, and emissions rates. For this analysis, SFDPH utilized meteorological data provided by BAAQMD for the Mission Bay meteorological station in San Francisco. Existing traffic volumes in the vicinity of the project were obtained from the SF CHAMP traffic model, which is maintained by the San Francisco Municipal Transportation Agency. Lastly, $PM_{2.5}$ emissions factors were obtained from EMFAC2007.

  The rooftop concentrations were evaluated because the air intakes are to be installed there. Modeled levels indicate that rooftop $PM_{2.5}$ levels from existing traffic volumes ranges from 0.03 to 0.06 $\mu g/m^3$. According to the SFDPH, the combined traffic volumes from Van Ness Avenue, Geary Boulevard, O'Farrell Street and Franklin Street exceed 137,000 vehicles/day. This volume of local traffic is greater than the volumes experienced near the Davies, Pacific and St. Luke's Campuses. Cathedral Hill Campus is anticipated to generate an additional 8,220 daily vehicle trips in the surrounding streets, which is approximately 6% additional traffic volume. This incremental increase in traffic is not expected to increase $PM_{2.5}$ concentrations beyond the 0.3 ug/m^3 threshold.

The sum of incremental $PM_{2.5}$ concentrations from project sources would not exceed the threshold; therefore, operations associated with the Cathedral Hill Campus would not expose sensitive receptors to substantial concentrations of toxic air contaminants. **This impact would be less than significant under the recently adopted BAAQMD CEQA significance criteria**.

Cathedral Hill Campus with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for Cathedral Hill Campus are expected to significantly change the construction or operations (including the number and duration of vehicle trips) associated with the campus. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For the Cathedral Hill Campus's project variants, for the same reasons as described previously, **this impact would be less than significant under the recently adopted BAAQMD CEQA significance criteria**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill Campus in the near term.

Davies Campus

- **$PM_{2.5}$ from diesel generators**: Impact AQ-5 presented screening-level air dispersion modeling for emissions from an emergency diesel generator at the Davies Campus, which estimated a maximum $PM_{2.5}$ incremental concentration of 0.008 µg/m^3.

- **$PM_{2.5}$ from natural gas boilers**: The incremental $PM_{2.5}$ emissions from the new natural gas boiler at the Davies Campus will be orders of magnitude lower than at Cathedral Hill Campus. As described above, emissions from the Cathedral Hill Campus boilers will produce $PM_{2.5}$ concentrations of approximately 0.01 µg/m^3. Although the two campuses may differ in terms of emission release heights, stack design, etc., such that the Cathedral Hill Campus results are not directly applicable to Davies Campus, it is unlikely that the Davies Campus's lower emissions would generate ambient $PM_{2.5}$ concentrations that are orders of magnitude higher than Cathedral Hill Campus.

- **$PM_{2.5}$ from project-generated traffic**: Because the $PM_{2.5}$ concentrations generated by local traffic are unlikely to exceed the value estimated at Cathedral Hill Campus (0.06 µg/m^3), total operational $PM_{2.5}$ emissions from the Davies Campus will be below the risk threshold of 0.3 µg/m^3.

The sum of incremental $PM_{2.5}$ concentrations from project sources would not exceed the threshold; therefore, operations associated with the Davies Campus would not expose sensitive receptors to substantial concentrations of toxic air contaminants. **This impact would be less than significant under the recently adopted BAAQMD CEQA significance criteria**.

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the near term.

St. Luke's Campus

- **$PM_{2.5}$ from diesel generators**: As discussed under Impact AQ-5, the net incremental emissions from diesel generators are below the trigger threshold for air toxics. As described above, emissions from the Davies Campus generator (which did exceed the threshold) produced $PM_{2.5}$ concentrations on the order of 0.008 µg/m^3. Although the two campuses may differ in terms of emission release heights, stack design, etc., such that the Davies Campus results are not directly applicable to St. Luke's Campus, it is unlikely that St. Luke's Campus's lower emissions would generate ambient concentrations that are orders of magnitude higher than Davies Campus.

- **$PM_{2.5}$ from natural gas boilers**: The incremental $PM_{2.5}$ emissions from the new natural gas boiler at the St. Luke's Campus will be lower than at Cathedral Hill Campus. As described above, emissions from the Cathedral Hill Campus boilers will produce $PM_{2.5}$ concentrations of approximately 0.01 µg/m^3. Although the two campuses may differ in terms of emission release heights, stack design, etc., such that the Cathedral Hill Campus results are not directly applicable to St. Luke's Campus, it is unlikely that St. Luke's Campus's lower emissions would generate ambient $PM_{2.5}$ concentrations that are orders of magnitude higher than Cathedral Hill Campus.

- **$PM_{2.5}$ from project-generated traffic**: $PM_{2.5}$ concentrations generated by local traffic are unlikely to exceed the value estimated at the Cathedral Hill Campus (0.06 ug/m^3), which experiences larger traffic volumes.

Hence, total operational $PM_{2.5}$ emissions from the St. Luke's Campus will be below the risk threshold. **This impact would be less than significant under the recently adopted BAAQMD CEQA significance criteria**.

St. Luke's Campus with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for the St. Luke's Campus are expected to significantly change the construction or operations (including traffic) associated with the campuses. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For the St. Luke's Campus's project variants, for the same reasons as described previously, **this impact would be less than significant under the recently BAAQMD CEQA significance criteria**.

Mitigation Measure: No mitigation or improvement measures are required at the St. Luke's Campus in the near term.

Long-Term Projects

◆ Pacific Campus

At this time, no additional diesel generators or natural gas boilers are planned for the Pacific Campus, and incremental ambient concentrations from local traffic are unlikely to exceed the value estimated at Cathedral Hill Campus (0.06 ug/m^3), which experiences larger traffic volumes. Hence, total operational $PM_{2.5}$ emissions from the Pacific Campus would be below the risk threshold, and would have **a less than significant impact under the recently adopted BAAQMD CEQA significance criteria**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific Campus in the long term.

Davies Campus

As described previously under "Near-Term Projects" at the Davies Campus, total operational $PM_{2.5}$ emissions from the Davies Campus will be below the risk threshold of 0.3 µg/m^3. **This impact would be less than significant under the recently BAAQMD CEQA significance criteria.**

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the long term.

IMPACT AQ-13 *Construction and operation under the LRDP would not expose a substantial number of people to objectionable odors (Recently adopted BAAQMD Guidelines). (Significance Criterion 7e)*

Levels of Significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: Less than significant*
- *Davies: Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Modifications to BAAQMD Significance Criteria

The recently adopted BAAQMD significance thresholds differ from the 1999 thresholds in two main areas:

1. Screening distances from certain major odor-generating land uses and operations were extended from 1 to 2 miles, and new types of odor-generating facilities were added to the list.
2. The number and frequency of odor complaints for facilities within the screening distances that would indicate a significant impact have changed from one to five confirmed complaints each year averaged over three consecutive years.

The impact described below is based on these modifications to BAAQMD significance criteria.

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

BAAQMD's recently adopted *Air Quality Guidelines (*June 2, 2010*)* contain a screening table that designates distances from a variety of sources, beyond which a receptor is deemed to be free of odor impacts. If a sensitive receptor is placed within the screening table distances from a listed source, BAAQMD's *Draft Air Quality Guidelines* recommend that lead agencies should contact BAAQMD to obtain the odor complaints over the past 3 years for the source in question, and calculate the annual average confirmed odor complaints filed for the source. BAAQMD considers a source to have a substantial number of odor complaints if the complaint history includes five or more confirmed complaints per year averaged over a 3-year period. The St. Luke's Campus is 1.5 miles from the San Francisco Public Utilities Commission Southeast Treatment Plant, and thus within the screening distance specified by the BAAQMD guidelines. However, there have been no odor complaints from the existing St. Luke's Campus related to the Southeast Treatment Plant. Accordingly, the impacts from odors related to that facility are considered less than significant. Other potential sources of odors listed in BAAQMD's *Draft Air Quality Guidelines* may be near the four campus locations, including painting or coating operations, coffee roasters, or compositing facilities. The proposed and existing campuses are currently developed with land uses that have had relatively large numbers of staff, patients, visitors, patrons, etc., and to date there have been no known complaints of odor impacts as the result of the existing odor sources within the ranges specified by the guidelines. Thus, it is reasonable to assume there will continue to be no complaints. Therefore, **this impact would be less than significant under the recently adopted BAAQMD CEQA significance criteria**.

Cathedral Hill and St. Luke's Campuses with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for Cathedral Hill and St. Luke's Campuses are expected to significantly change the construction or operations (including the number and duration of vehicle trips) associated with the campuses. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For both campuses, for the same reasons as described previously, **this impact would be less than significant under the recently adopted BAAQMD CEQA significance criteria**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, or St. Luke's Campuses in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

This long-term impact would be similar to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. For the same reasons as discussed above, **this impact would be less significant under the recently adopted BAAQMD CEQA significance criteria**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific or Davies Campuses in the long term.

IMPACT AQ-14

The proposed LRDP's operational emissions of toxic air contaminants would not contribute to a cumulatively considerable impact on sensitive receptors.

The proposed LRDP's construction emissions of toxic air contaminants would potentially contribute to a cumulatively considerable impact on sensitive receptors (Recently adopted BAAQMD Guidelines). (Significance Criterion 7d)

Levels of Significance:

- *Cathedral Hill (with or without project variants): Potentially significant and unavoidable with mitigation (construction); Less than significant (operations)*
- *Pacific: Potentially significant and unavoidable with mitigation (construction); Less than significant (operations)*
- *Davies: Potentially significant and unavoidable with mitigation (construction); Less than significant (operations)*
- *St. Luke's (with or without either project variant): Potentially significant and unavoidable with mitigation (construction); Less than significant (operations)*

Modifications to BAAQMD Significance Criteria

The recently adopted BAAQMD significance thresholds differ from the 1999 thresholds by adding a zone of influence analysis for any operational or construction source within 1,000-foot radius of the project fence line, such that the cumulative impacts cannot exceed any of the following:

- cancer risk of 100 in 1 million,
- noncancer chronic HI of 10,
- $PM_{2.5}$ concentration threshold of 0.8 $\mu g/m^3$.

Impact Evaluation Based on Recently Adopted BAAQMD Thresholds

The proposed project's community risk and cumulative impact analysis is provided below for existing stationary sources and on-road mobile sources from roadways. This analysis references quantitative evaluations presented under Impact AQ-5. It should be noted that this analysis is not applicable to the proposed project, and is provided here for informational purposes. For the evaluation, it is important to note that BAAQMD considers the proposed operational thresholds of significance as "the emissions level above which a project's individual emissions would result in a cumulatively considerable contribution to the SFBAAB's existing air quality conditions."[67] Furthermore, based on modeling conducted in support of the *Draft BAAQMD CEQA Guidelines*, a roadway

[67] Bay Area Air Quality Management District. 1999 (December). *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans.* op. cit. Page 47.

source consisting of fewer than 10,000 daily vehicles would have a less than significant impact.[68] Hence, a source that is not significant with respect to the single source thresholds is also considered not cumulatively significant.

Near-Term and Long-Term Projects

◆ All Campuses

On-Site Sensitive Receptors (Construction and Operational Emissions)

On-site patient receptors were identified as sensitive receptors for the purposes of this project. As discussed for Impact AQ-5, a patient's duration of stay at the hospital would be relatively short, i.e., on the order of 5 days. In contrast, chronic exposures are typically measured on the order of years. As a result, examination of cancer risk or chronic noncancer hazards to receptors at the proposed hospitals was not applicable as there would be no chronic exposure. **This impact would be less than significant under the recently adopted BAAQMD CEQA significance criteria**.

Near-Term Projects

◆ Cathedral Hill Campus

Off-Site Sensitive Receptors (Operational Emissions)

As shown in the evaluation for Impact AQ-5, operational TAC emissions at Cathedral Hill Campus were found to be less than significant regarding the single-source operational risk thresholds. As discussed above, this also means that no cumulatively considerable contribution to community risk would occur. Given that the campus will generate fewer than 10,000 daily vehicle trips, the project-generation mobile source emissions were deemed **less than significant under the recently adopted BAAQMD CEQA significance criteria**.

Thus, **operations at Cathedral Hill Campus would not contribute to cumulatively considerable impact on off-site sensitive receptors under the recently adopted BAAQMD CEQA significance criteria**.

Off-Site Sensitive Receptors (Construction Emissions)

Based on the modeling and risk evaluation for construction $PM_{2.5}$ emissions presented in Impact AQ-10, Cathedral Hill Campus would have a significant impact on off-site receptors, even after all feasible mitigation is incorporated. Thus, the Cathedral Hill Campus **construction emissions would also have a potentially**

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[68] Ibid.

cumulatively considerable impact on off-site receptors, although the method to evaluate cumulative impacts of construction emissions is currently under development.

While it is possible that Mitigation Measure M-AQ-N10a could reduce the carcinogenic risk and chronic noncarcinogenic health hazards posed by DPM emissions below the single-source thresholds, it is unknown at this time to what extent such equipment will be available at the time of construction, or how this would affect a significant cumulative impact. In light of this uncertainty, this **impact would remain significant and unavoidable.**

Cathedral Hill Campus with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for Cathedral Hill Campus are expected to significantly change the construction or operations (including traffic) associated with the campus. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For the same reasons as described previously, **construction emissions from the Cathedral Hill Campus's project variants would have a potentially cumulatively considerable impact on off-site receptors, and operational emissions would have a less than significant impact on off-site receptors, under the recently adopted BAAQMD CEQA significance criteria**.

◆ Davies Campus

Off-Site Sensitive Receptors (Operational Emissions)

Similar to the Cathedral Hill Campus, the stationary sources have less than significant impacts; the project-generated traffic is below 10,000 vehicles per day, and on-site receptors do not have chronic exposure to project emissions. Thus**, near-term operations at Davies Campus would not contribute to cumulatively considerable impact on off-site sensitive receptors under the recently adopted BAAQMD CEQA significance criteria**.

Off-Site Sensitive Receptors (Construction Emissions)

Based on the modeling and risk evaluation for construction $PM_{2.5}$ emissions presented in Impact AQ-10, Davies Campus would have a significant impact on off-site receptors, even after all feasible mitigation is incorporated. Thus, the Davies Campus **construction emissions would also have a potentially cumulatively considerable impact on off-site receptors**, although the method to evaluate cumulative impacts of construction emissions is currently under development.

As discussed previously, while it is possible that Mitigation Measure M-AQ-N10b could reduce the carcinogenic risk and chronic noncarcinogenic health hazards posed by DPM emissions below the single-source thresholds, it is unknown at this time to what extent such equipment will be available at the time of construction, or how this would affect a significant cumulative impact. In light of this uncertainty, this **impact would remain significant and unavoidable.**

◆ St. Luke's Campus

Off-Site Sensitive Receptors (Operational Emissions)

Similar to the Cathedral Hill Campus, the stationary sources have less than significant impacts; the project-generated traffic is below 10,000 vehicles per day, and on-site receptors do not have chronic exposure to project emissions. Thus, **operations at St. Luke's Campus would not contribute to cumulatively considerable impact on off-site sensitive receptors under the recently adopted BAAQMD CEQA significance criteria**.

Off-Site Sensitive Receptors (Construction Emissions)

Based on the modeling and risk evaluation for construction $PM_{2.5}$ emissions presented in Impact AQ-10, St. Luke's Campus would have a significant impact on off-site receptors, even after all feasible mitigation is incorporated. Thus, the St. Luke's Campus construction emissions would also have a **potentially cumulatively considerable impact on off-site receptors**, although the method to evaluate cumulative impacts of construction emissions is currently under development.

As discussed previously, while it is possible that Mitigation Measure M-AQ-N10c could reduce the carcinogenic risk and chronic noncarcinogenic health hazards posed by DPM emissions below the single-source thresholds, it is unknown at this time to what extent such equipment will be available at the time of construction, or how this would affect a significant cumulative impact. In light of this uncertainty, this **impact would remain significant and unavoidable.**

St. Luke's Campus with Project Variants: As detailed in "Methodology for Assessing Impacts under CEQA and Applicable BAAQMD Significance Criteria" on page 4.7-26, none of the project variants for the St. Luke's Campus are expected to significantly change the construction or operations (including traffic) associated with the campuses. Hence, the project variants are not expected to significantly change emission estimates, associated health risks, or the impact determinations derived from them. For the same reasons as described previously, **construction emissions from the St. Luke's Campus's project variants would have a potentially cumulatively considerable impact on off-site receptors, and operational emissions would have a less than significant impact on off-site receptors, under the recently adopted BAAQMD CEQA significance criteria**.

Long-Term Projects

◆ Pacific Campus

Off-Site Sensitive Receptors (Operational Emissions)

Similar to the Cathedral Hill Campus, the stationary sources have less than significant impacts; the project-generated traffic is below 10,000 vehicles per day, and on-site receptors do not have chronic exposure to project emissions. Thus, **operations at Pacific Campus would not contribute to cumulatively considerable impact on off-site sensitive receptors under the recently adopted BAAQMD CEQA significance criteria**.

Off-Site Sensitive Receptors (Construction Emissions)

Based on the modeling and risk evaluation for construction $PM_{2.5}$ emissions presented in Impact AQ-10, Pacific Campus would have a significant impact on off-site receptors, even after all feasible mitigation is incorporated. Thus, the Pacific Campus **construction emissions would also have a potentially cumulatively considerable impact on off-site receptors**, although the method to evaluate cumulative impacts of construction emissions is currently under development.

As discussed previously, while it is possible that Mitigation Measure M-AQ-L10 could reduce the carcinogenic risk and chronic noncarcinogenic health hazards posed by DPM emissions below the single-source thresholds, it is unknown at this time to what extent such equipment will be available at the time of construction, or how this would affect a significant cumulative impact. In light of this uncertainty, this **impact would remain significant and unavoidable.**

◆ Davies Campus

Off-Site Sensitive Receptors (Operational Emissions)

This impact would be identical to the impact of near-term projects at the Davies Campus for the same reasons as discussed above. Thus**, long-term operations at Davies Campus would not contribute to cumulatively considerable impact on off-site sensitive receptors under the recently adopted BAAQMD CEQA significance criteria**.

Off-Site Sensitive Receptors (Construction Emissions)

Based on the modeling and risk evaluation for construction $PM_{2.5}$ emissions presented in Impact AQ-10, Davies Campus would have a significant impact on off-site receptors, even after all feasible mitigation is incorporated. Thus, the Davies Campus **construction emissions would also have a potentially cumulatively considerable**

impact on off-site receptors, although the method to evaluate cumulative impacts of construction emissions is currently under development.

As discussed previously, while it is possible that Mitigation Measure M-AQ-L10 could reduce the carcinogenic risk and chronic noncarcinogenic health hazards posed by DPM emissions below the single-source thresholds, it is unknown at this time to what extent such equipment will be available at the time of construction, or how this would affect a significant cumulative impact. In light of this uncertainty, this **impact would remain significant and unavoidable.**

4.7.6 CUMULATIVE IMPACTS

Please refer to the analysis of cumulative impacts in Impacts AQ-7 (page 4.7-55) and AQ-14 (page 4.7-80).

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4.8 GREENHOUSE GAS EMISSIONS

This section provides a description of global climate change, greenhouse gas (GHG) emissions, the existing regulatory framework surrounding GHG emissions, and an analysis of the potential impacts related to GHGs associated with implementation of the proposed LRDP. The GHG emissions associated with construction and operation of the LRDP are quantified and analyzed in the context of the evolving regulatory environment.

4.8.1 ENVIRONMENTAL SETTING

SOURCES OF GREENHOUSE GAS EMISSIONS

Gases that trap heat in the atmosphere are referred to as GHGs because they capture heat radiated from the earth, similar to a greenhouse. The accumulation of GHGs has been implicated as a driving force for global climate change. Definitions of climate change vary between and across regulatory authorities and the scientific community, but in general can be described as the changing of the earth's climate caused by natural fluctuations and anthropogenic activities that alter the composition of the global atmosphere.

Individual projects contribute to the cumulative effects of climate change by emitting GHGs during demolition, construction, and operational phases. The primary GHGs associated with land use development projects are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Although the presence of the primary GHGs in the atmosphere is naturally occurring, CO_2, CH_4, and N_2O are largely emitted from human activities, accelerating the rate at which these compounds accumulate in the earth's atmosphere. CO_2 is the "reference gas" for GHG emissions, meaning that emissions of total GHGs are typically reported in "carbon dioxide equivalent" (CO_2e). Emissions of CO_2 are largely byproducts of fossil fuel combustion, whereas methane results from offgassing associated with agricultural practices and landfills. Other GHGs, with much greater heat-absorption potential than CO_2, include hydrofluorocarbons (HFCs), perfluorocarbons, and sulfur hexafluoride, and are generated in certain industrial processes.

There is international scientific consensus that human-caused increases in GHGs have contributed, and will continue to contribute, to global warming, although there is uncertainty concerning the magnitude and rate of the warming. Potential global warming impacts in California may include a decrease in snowpack, sea level rise, more extreme heat days per year, more high ozone days, increased frequency and intensity of wildfires, and more drought years.[1] Secondary effects are likely to include a global rise in sea level, impacts on agriculture, water resources, changes in disease vectors, and changes in habitat and biodiversity.

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[1] California Natural Resources Agency. 2009. *2009 California Climate Adaptation Strategy Discussion Draft*. Sacramento, CA. Pages 48–55.

The California Air Resources Board (ARB) estimated that in 2006 California produced a gross total of about 484 million metric tons (MMT) of CO_2e, or about 535 million U.S. tons.[2] ARB found that transportation is the source of 38% of the state's GHG emissions, followed by electricity generation (both in state and out of state) at 22% and industrial sources at 20%. Commercial and residential fuel use (primarily for heating) accounted for 9% of GHG emissions.[3] In the Bay Area, fossil fuel consumption in the transportation sector (on-road motor vehicles, off-highway mobile sources, and aircraft), as well as in the industrial and commercial sectors, are the two largest sources of GHG emissions, each accounting for approximately 36% of the Bay Area's 95.8 MMT CO_2e emitted in 2007.[4] Electricity generation accounts for approximately 16% of the Bay Area's GHG emissions, followed by residential fuel usage at 7%, off-road equipment at 3%, and agriculture at 1%.[5]

4.8.2 Regulatory Framework

Federal

Supreme Court Ruling on California Clean Air Act Waiver

The U.S. Environmental Protection Agency (EPA) is the federal agency responsible for implementing the Clean Air Act (CAA). The U.S. Supreme Court ruled on April 2, 2007, that CO_2 is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs. However, there are no federal regulations or policies regarding GHG emissions applicable to the proposed LRDP. (See Assembly Bill [AB] 1493 for further information on the California Clean Air Act [CCAA] Waiver.)

Energy and Independence Security Act of 2007 and Corporate Average Fuel Economy Standards

The Energy and Independence Security Act of 2007 (EISA) amended the Energy Policy and Conservation Act (EPCA) to further reduce fuel consumption and expand production of renewable fuels. The EISA's most significant amendment includes a statutory mandate for the National Highway Traffic Safety Administration (NHTSA) to set passenger car corporate average fuel economy (CAFE) standards for each model year (MY) at the maximum feasible level. This statutory mandate also eliminates the old default CAFE standard of 27.5 miles per gallon (mpg). The EISA requires that CAFE standards for MY 2011–2020 be set sufficiently high to achieve the goal of an industrywide passenger car and light-duty truck average CAFE standard of 35 mpg. The rule making for this goal, per President Barack Obama's request, has been divided into two separate parts. The first

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2 California Air Resources Board. 2009. *California Greenhouse Gas Inventory for 2000–2006—by Category as Defined in the Scoping Plan.* Sacramento, CA. Available: http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_2009-03-13.pdf. Accessed March 2, 2010.

3 Ibid.

4 Bay Area Air Quality Management District. 2010 (February). *Source Inventory of Bay Area Greenhouse Gas Emissions: Base Year 2007, Updated: February 2010.* Available: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/regionalinventory2007_2_10.ashx. Accessed March 2, 2010.

5 Ibid.

part, which was published in the *Federal Register* in March 2009, includes CAFE standards for MY 2011 so as to meet the statutory deadline (i.e., March 30, 2009). The second part of the rule making applies to MY 2012 and subsequent years. These would be the maximum CAFE standards feasible under the limits of the EISA and the EPCA. NHTSA and EPA are working in coordination to develop a national program targeting MY 2012–2016 passenger cars and light trucks.

U.S. Environmental Protection Agency Actions

In response to the issue of climate change, EPA has taken actions to regulate, monitor, and potentially reduce GHG emissions.

Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act

On April 23, 2009, EPA published its proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the CAA (Endangerment Finding) in the *Federal Register*. The Endangerment Finding is based on Section 202(a) of the CAA, which states that the EPA Administrator should regulate and develop standards for "emission[s] of air pollution from any class or classes of new motor vehicles or new motor vehicle engines, which in [its] judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." The proposed rule addresses Section 202(a) in two distinct findings. The first addresses whether or not the concentrations of the six key GHGs (i.e., CO_2, CH_4, N_2O, HFCs, perflurorocarbons, and sulfur hexafluoride) in the atmosphere threaten the public health and welfare of current and future generations. The second addresses whether or not the combined emissions of GHGs from new motor vehicles and motor vehicle engines contribute to atmospheric concentrations of GHGs and thus increase the threat of climate change.

The EPA Administrator proposed the finding that atmospheric concentrations of GHGs endanger the public health and welfare within the meaning of Section 202(a) of the CAA. The evidence supporting this finding consists of human activity resulting in "high atmospheric levels" of GHG emissions, which are very likely responsible for increases in average temperatures and other climatic changes. Furthermore, the observed and projected results of climate change (e.g., higher likelihood of heat waves, wildfires, droughts, sea level rise, and higher intensity storms) are a threat to public health and welfare. Accordingly, GHGs were found to endanger the public health and welfare of current and future generations.

The Administrator also proposed the finding that GHG emissions from new motor vehicles and motor vehicle engines are contributing to air pollution, which is endangering public health and welfare. The proposed finding states that in 2006, motor vehicles were the second largest contributor to domestic GHG emissions (24% of the total), behind electricity generation. Furthermore, in 2005, the U.S. was responsible for 18% of global GHG emissions. Thus, GHG emissions from motor vehicles and motor vehicle engines were found to contribute to air pollution that endangers public health and welfare.

On December 7, 2009, EPA finalized its decision that GHG emissions from motor vehicles constitute an "endangerment" under the CAA. This EPA finding allows for the establishment of GHG emissions standards for new motor vehicles.

STATE

ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the CCAA, adopted in 1988. With the passage of Assembly Bill (AB) 32, ARB was also given broad responsibility for promulgating regulations designed to achieve the general goals of AB 32. (For a discussion of AB 32, see "Assembly Bill 32 and the California Climate Change Scoping Plan" below.)

Various statewide and local initiatives have been introduced to reduce the state's contribution to GHG emissions. However, because every nation emits GHGs and thus makes an incremental cumulative contribution to global climate change, cooperation on a global scale will be required to reduce the rate of GHG emissions to a level that can effectively slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

Assembly Bill 1493

In 2002, then-Governor Gray Davis signed AB 1493, which required that ARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks and other vehicles determined by ARB to be vehicles whose primary use is noncommercial personal transportation in the state."

To meet the requirements of AB 1493, ARB approved amendments to the California Code of Regulations (CCR) in 2004, adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 (13 CCR 1900, 1961), and adoption of Section 1961.1 (13 CCR 1961.1), require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight [GVW] rating of less than 10,000 pounds and which is designed primarily for the transportation of persons), beginning with MY 2009. For passenger cars and light-duty trucks with a loaded vehicle weight (LVW) of 3,750 pounds or less, the GHG emission limits for MY 2016 are approximately 37% lower than the limits for the first year of the regulations, MY 2009. For light-duty trucks with an LVW of 3,751 pounds to a GVW of 8,500 pounds, as well as for medium-duty passenger vehicles, GHG emissions will be reduced approximately 24% between 2009 and 2016.

In December 2004, a group of car dealerships, automobile manufacturers, and trade groups representing automobile manufacturers filed suit against ARB to prevent enforcement of 13 CCR Sections 1900 and 1961, as amended by AB 1493 and 13 CCR 1961.1 (*Central Valley Chrysler-Jeep et al. v. Catherine E. Witherspoon, in Her Official Capacity as Executive Director of the California Air Resources Board et al.*). The automakers' suit in the U.S. District Court for the Eastern District of California contended that California's implementation of regulations, which, in effect, regulate vehicle fuel economy, violates various federal laws, regulations, and policies.

On December 12, 2007, the Court found that if California receives appropriate authorization from EPA (the last remaining factor in enforcing the standard), these regulations would be consistent with, and have the force of, federal law, and thus rejected the automakers' claim. This authorization to implement more stringent standards in California was requested in the form of a CAA Section 209(b) waiver in 2005. EPA failed to act on granting California authorization to implement the standards. Governor Arnold Schwarzenegger and Attorney General Edmund G. Brown Jr. filed suit against EPA for the delay. In December 2007, EPA Administrator Stephen Johnson denied California's request for the waiver to implement AB 1493. Johnson cited the need for a national approach to reducing GHG emissions, the lack of a "need to meet compelling and extraordinary conditions," and the emissions reductions that would be achieved through the Energy Independence and Security Act of 2007, as the reasoning for the denial.[6]

The State of California filed suit against EPA for its decision to deny the CAA waiver. The recent change in presidential administration directed EPA to reexamine its position for denial of California's CAA waiver and for its past opposition to GHG emissions regulation. California received the waiver on June 30, 2009.

Executive Order S-3-05

In 2005, in recognition of California's vulnerability to the effects of climate change, Governor Schwarzenegger established Executive Order S-3-05, which sets forth a series of target dates by which statewide GHGs emissions would be progressively reduced: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80% below 1990 levels.

Assembly Bill 32 and the California Climate Change Scoping Plan

In 2006, California passed the California Global Warming Solutions Act of 2006 (California Health and Safety Code Division 25.5, Section 38500 et seq. [AB 32]), which requires ARB to design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25% reduction in emissions).

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[6] Office of the White House. 2009. *Memorandum for the Administrator of the Environmental Protection Agency*. Available: http://www.whitehouse.gov/the_press_office/Presidential_Memorandum_EPA_Waiver/. Accessed August 2009.

AB 32 establishes a timetable for ARB to adopt emissions limits, rules, and regulations designed to achieve the intent of the California Global Warming Solutions Act. To meet these goals, California must reduce its GHGs by approximately 30% below projected 2020 business-as-usual emissions levels, or about 15% from today's levels.[7] In December 2008, ARB adopted its *Climate Change Scoping Plan,* which estimates a reduction of approximately 174 MMT CO_2e from the state's projected 2020 GHG emissions is required to achieve the AB 32 2020 target. Approximately one-third of the emissions reductions strategies fall within the transportation sector. These strategies include the following: California Light-Duty Vehicle GHG standards, the Low Carbon Fuel Standard, Regional Transportation-Related GHG Targets, Vehicle Efficiency Measures, Goods Movement, Medium and Heavy-Duty Vehicle Efficiency Measures, and High Speed Rail. These measures are expected to reduce GHG emissions by 62.3 MMT CO_2e.[8] Emissions from the electricity sector are expected to be reduced another 49.7 MMT CO_2e.[9] Emissions reductions from the electricity sector include Energy Efficiency (e.g., appliances, technology, policy, and standards), Renewable Portfolio Standard (33% renewable energy by 2020), and the Million Solar Roofs Program (AB 1470). Other emissions reductions are expected from industrial sources, agriculture, forestry, recycling and waste, water, and emissions reductions from cap-and-trade programs. State and local government actions and regional GHG targets are also expected to yield GHG emissions reductions. Measures that could become effective during implementation pertain to construction-related equipment and building and appliance energy efficiency. Some proposed measures will require new legislation to implement, some will require subsidies, some have already been developed, and some will require additional effort to evaluate and quantify. Additionally, some emissions reduction strategies may require their own environmental review under CEQA or the National Environmental Policy Act. Applicable measures that are ultimately adopted will become effective during implementation of the proposed LRDP, and the LRDP could be subject to these requirements, depending on the LRDP's timeline. It should be noted that ARB has not determined the level of GHG emissions reductions recommended for local government operations. The *Climate Change Scoping Plan* includes an estimate of GHG emissions reductions from local land use changes; however, these emissions reductions are not intended to represent Senate Bill (SB) 375's regional reduction targets, which are discussed further below. The regional targets and associated GHG emissions reductions for SB 375 will be established by ARB in collaboration with the Regional Target Advisory Committee and a public consultation process with metropolitan planning organizations (MPOs) and other stakeholders.

Executive Order S-1-07

Executive Order S-1-07, signed by Governor Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, at over 40% of statewide emissions. The order establishes a goal

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[7] California Air Resources Board. 2008. *Climate Change Scoping Plan*. Available: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed September 2009. Page ES-1.

[8] Ibid, p. 17.

[9] Ibid.

of reducing the carbon intensity of transportation fuels sold in California by a minimum of 10% by 2020. It also directed ARB to determine whether this Low Carbon Fuel Standard could be adopted as a discrete, early-action measure after meeting the mandates in AB 32. ARB adopted the Low Carbon Fuel Standard on April 23, 2009.

Senate Bill 1078 and 107 and Executive Order S-14-08 and S-21-09

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20% of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Portfolio Standard to 33% renewable power by 2020. Governor Schwarzenegger plans to propose legislative language that will codify the new higher standard.[10] In September 2009, Governor Schwarzenegger continued California's commitment to the Renewable Portfolio Standard by signing Executive Order S-21-09, which directs ARB under its AB 32 authority to enact regulations to help the state meet its Renewable Portfolio Standard goal of 33% renewable energy by 2020.

Senate Bill 97

SB 97, signed in August 2007, acknowledges that climate change is a prominent environmental issue requiring analysis under CEQA. This bill directs the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Natural Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, no later than July 1, 2009. The California Natural Resources Agency was required to certify or adopt those guidelines by January 1, 2010. On April 13, 2009, OPR submitted to the Secretary for Natural Resources its proposed amendments to the State CEQA Guidelines for GHG emissions, as required by SB 97. These State CEQA Guidelines amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. On December 30, 2009, the Natural Resources Agency adopted the State CEQA Guidelines amendments, as required by SB 97. The amendments have been reviewed by the Office of Administrative Law, and on February 16, 2010, they were transmitted to the Secretary of State for inclusion in the CCR. The amendments became effective March 18, 2010. Accordingly, OPR's State CEQA Guidelines amendments have been incorporated into this analysis.

Senate Bill 375

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG emissions reduction targets, and land use and housing allocations. SB 375 requires MPOs to adopt a Sustainable

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[10] Office of the Governor. 2008. *Press Release: Governor Schwarzenegger Advances State's Renewable Energy Development*. Available: http://gov.ca.gov/index.php?/press-release/11073. Accessed August 2009.

Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). ARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years, but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG emissions reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012.

This bill also extends the minimum time period for the Regional Housing Needs Allocation cycle from 5 years to 8 years for local governments located within an MPO that meets certain requirements. City and county land use policies (including general plans) are not required to be consistent with the RTP (and associated SCS or APS). However, new provisions of CEQA would incentivize qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."

CITY/LOCAL

Bay Area Air Quality Management District Climate Protection Program

The Bay Area Air Quality Management District (BAAQMD) established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the San Francisco Bay Area Air Basin. The climate protection program includes measures that promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy, all of which assist in reducing emissions of GHGs and in reducing air pollutants that affect the health of residents. BAAQMD also seeks to support current climate protection programs in the region and to stimulate additional efforts through public education and outreach, technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders. BAAQMD recently adopted revised CEQA significance thresholds for GHG emissions. These recently adopted GHG significance thresholds are discussed in detail under "Significance Criteria" below.

City and County of San Francisco San Francisco's GHG Reduction Strategy

The City and County of San Francisco (City) has a history of environmental protection policies and programs aimed at improving the quality of life for residents and reducing impacts on the environment. The following plans, policies, and legislation demonstrate San Francisco's continued commitment to environmental protection. They include measures relevant to the proposed LRDP that would decrease the amount of GHG emitted into the atmosphere and thus decrease San Francisco's overall contribution to climate change. These programs are collectively referred to as San Francisco's GHG Reduction Strategy.

Transit First Policy

In 1973, the City instituted the Transit First Policy, which added Article 8A, Section 8A.115 to the City Charter with the goal of reducing San Francisco's reliance on freeways and meeting transportation needs by emphasizing mass transportation. The Transit First Policy gives priority to public transit investments; adopts street capacity and parking policies to discourage increased automobile traffic; and encourages the use of transit, bicycling, and walking instead of single-occupant vehicles.

San Francisco Sustainability Plan

In July 1997, the Board of Supervisors endorsed the *Sustainability Plan for the City and County of San Francisco*, which establishes sustainable development as a fundamental goal of municipal public policy.

The Electricity Resource Plan (Revised December 2002)

The City adopted the *Electricity Resource Plan* to help address growing environmental health concerns in San Francisco's southeast community, the site of two power plants. The plan presents a framework for assuring a reliable, affordable, and renewable source of energy for the future of San Francisco.

The Climate Action Plan for San Francisco

In February 2002, the San Francisco Board of Supervisors passed the Greenhouse Gas Emissions Reduction Resolution (Number 158-02) that set a goal for the City to reduce GHG emissions to 20% below 1990 levels by the year 2012. In September 2004, the San Francisco Department of the Environment and San Francisco Public Utilities Commission published the *Climate Action Plan for San Francisco: Local Actions to Reduce Greenhouse Gas Emissions*.[11] This climate action plan provides the context of climate change in San Francisco and examines strategies to meet the 20% GHG emissions reduction target. Although the Board of Supervisors has not formally committed the City to perform the actions addressed in the plan, and many of the actions require further development and commitment of resources, the plan serves as a blueprint for GHG emissions reductions, and several actions have been implemented or are now in progress.

San Francisco Municipal Transportation Agency's Zero Emissions 2020 Plan

The Zero Emissions 2020 Plan focuses on the purchase of cleaner emission transit buses, including hybrid diesel-electric buses. Under this plan, hybrid buses will replace the oldest diesel buses, some dating back to 1988. The hybrid buses emit 95% less particulate matter (soot) than the buses they replace; they produce 40% less nitrogen oxides and reduce GHGs by 30%.

[11] San Francisco Department of the Environment and San Francisco Public Utilities Commission, 2004 (September), *Climate Action Plan for San Francisco: Local Actions to Reduce Greenhouse Emissions.* San Francisco, CA.

Zero Waste

In 2004, the City committed to a goal of diverting 75% of its waste from landfills by 2010, with the ultimate goal of zero waste by 2020. San Francisco currently recovers 72% of discarded material.[12]

Construction and Demolition Debris Recovery Ordinance

In 2006, the City adopted Ordinance No. 27-06, requiring all construction and demolition debris to be transported to a registered facility that can divert a minimum of 65% of the material from landfills. This ordinance applies to all construction, demolition, and remodeling projects within the city.

Greenhouse Gas Reduction Ordinance

In May 2008, the City adopted an ordinance amending the San Francisco Environment Code to establish GHG emissions targets and departmental action plans, to authorize the San Francisco Department of the Environment to coordinate efforts to meet these targets, and to make environmental findings. The ordinance establishes the following GHG emissions reduction limits for San Francisco and the target dates by which to achieve them:

- Determine 1990 City GHG emissions by 2008, the baseline level with reference to which target reductions are set.
- Reduce GHG emissions by 25% below 1990 levels by 2017.
- Reduce GHG emissions by 40% below 1990 levels by 2025.
- Reduce GHG emissions by 80% below 1990 levels by 2050.

The ordinance also specifies requirements for City departments to prepare climate action plans that assess GHG emissions associated with their activities and activities regulated by them, report the results of those assessments to the San Francisco Department of the Environment, and prepare recommendations to reduce emissions. In particular, the San Francisco Planning Department is required to (1) update and amend the City's applicable General Plan elements to include the emissions reduction limits set forth in this ordinance and policies to achieve those targets; (2) consider a project's impact on the City's GHG emissions reduction limits specified in this ordinance as part of its review under CEQA; and (3) work with other City departments to enhance the Transit First Policy to encourage a shift to sustainable modes of transportation, thereby reducing emissions and helping to achieve the targets set forth by the ordinance.

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[12] San Francisco Department of the Environment. 2010. Zero Waste. Available: http://www.sfenvironment.org/our_programs/overview.html?ssi=3. Accessed June 2010.

GoSolarSF

On July 1, 2008, the San Francisco Public Utilities Commission launched its “GoSolarSF” program to San Francisco’s businesses and residents, offering incentives in the form of a rebate program that could pay for approximately half the cost of installation of a solar power system and more to those qualifying as low-income residents.

City and County of San Francisco’s Green Building Ordinance

On August 4, 2008, Mayor Gavin Newsom signed into law San Francisco’s Green Building Ordinance for newly constructed residential and commercial buildings and renovations to existing buildings. The ordinance specifically requires newly constructed commercial buildings over 5,000 square feet, residential buildings over 75 feet in height, and renovations on buildings over 25,000 square feet to be subject to an unprecedented level of required Leadership in Energy and Environmental Design (LEED®) Green Building Rating System™ certifications, which makes San Francisco the city with the most stringent green building requirements in the nation. Cumulative benefits of this ordinance includes reducing CO_2 emissions by 60,000 tons, saving 220,000 megawatt-hours of power, saving 100 million gallons of drinking water, reducing waste and stormwater by 90 million gallons, reducing construction and demolition waste by 700 million pounds, increasing the valuations of recycled materials by $200 million, reducing 540,000 automobile trips, and increasing generation of green power by 37,000 megawatt-hours.[13]

The Green Building Ordinance also continues San Francisco’s efforts to reduce local GHG emissions to 20% below 1990 levels by the year 2012, a goal outlined in the City’s 2004 climate action plan. In addition, by reducing San Francisco’s emissions, this ordinance furthers efforts to reduce GHG emissions statewide, as mandated by the California Global Warming Solutions Act of 2006.

The City has also passed ordinances to reduce waste from retail and commercial operations. Ordinance 295-06, the Food Waste Reduction Ordinance, prohibits the use of polystyrene foam disposable food serviceware and requires biodegradable/compostable or recyclable food serviceware by restaurants, retail food vendors, city departments, and city contractors. Ordinance 81-07, the Plastic Bag Reduction Ordinance, requires stores located within the city to use compostable plastic, recyclable paper, and/or reusable checkout bags.

The San Francisco Planning Department and the San Francisco Department of Building Inspection have also developed a streamlining process for solar photovoltaic permits and priority permitting mechanisms for projects pursuing LEED® Gold certification.

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[13] These findings are contained within the final Green Building Ordinance, signed by the mayor on August 4, 2008.

The San Francisco Planning Code reflects the latest smart growth policies and includes electric vehicle refueling stations in city parking garages, bicycle storage facilities for commercial and office buildings, and zoning that is supportive of high-density mixed-use infill development. The City's more recent area plans, such as the *Rincon Hill Area Plan* and the *Market and Octavia Area Plan*, provide transit-oriented development policies that allow for neighborhood-oriented retail services and limit off-street parking to accessory parking spaces.[14] At the same time, there is a communitywide focus on ensuring that San Francisco's neighborhoods are "livable," reflected in the *San Francisco Better Streets Plan*, which would improve streetscape policies throughout the city; the Transit Effectiveness Project, which aims to improve transit service; and the *San Francisco Bicycle Plan*. All of these plans and projects are intended to promote alternative transportation options for residents and visitors.

City and County of San Francisco Commuter Benefits Ordinance

The City adopted an ordinance, effective January 19, 2009, that allows commuters to deduct up to $230 per month, pretax, for transit and vanpool expenses. These commuter benefits must be offered by any employer with 20 employees or more that operates within the city. To qualify for these benefits, employees must work at least 10 hours per week averaged over a calendar month. Although not required by the ordinance, employers can offer the commuter benefits to employees who work fewer than 10 hours per week averaged over a month.

City and County of San Francisco Mandatory Recycling and Composting Ordinance

The City adopted an ordinance, effective October 21, 2009, that requires all businesses and residences to compost food scraps and biodegradable products. Green, blue, and black bins will be distributed to businesses and residents to sort their food and other biodegradable waste, recycling, and trash, respectively. Businesses and residences that do not comply with the ordinance are subject to fines, depending on the level and duration of noncompliance. A moratorium on fines will be in place until July 2011 for owners and tenants of multifamily buildings and multitenant commercial buildings to allow time to adjust to the mandatory recycling and composting.

San Francisco has been actively pursuing cleaner energy, alternative transportation, and solid waste policies, many of which have been codified into regulations as discussed above. In an independent review of San Francisco's communitywide emissions, it was reported that San Francisco has achieved a 5% reduction in communitywide GHG emissions below the Kyoto Protocol 1990 baseline levels. The 1997 Kyoto Protocol sets a greenhouse gas reduction target of 7% below 1990 levels by 2012. The "community-wide inventory" includes greenhouse gas emissions generated by San Francisco—from residents, businesses, and commuters as well as

[14] See San Francisco Planning Code Sections 206.4 and 155.

from municipal operations. The inventory also includes emissions from both transportation and building energy sources.[15]

4.8.3 CUMULATIVE CONDITIONS

Impacts related to global GHG emissions are inherently cumulative. It is widely recognized that GHG emissions associated with human activities are contributing to changes in the global climate, and that such changes are having, and would have, adverse effects on the environment, the economy, and public health. These changes are the cumulative effects of past, present, and future actions worldwide. For a particular proposed action, it is possible to quantify the GHGs that would be emitted, either directly from development sources or indirectly from other sources, such as electricity consumption related to implementation of the proposed LRDP. However, those emissions cannot be tied to a particular adverse climate change effect on the environment, but contribute cumulatively to GHG emissions that can have an adverse impact. The significance criteria presented in the next section assess an individual development's potential to have a significantly cumulative contribution to global climate change.

4.8.4 SIGNIFICANCE CRITERIA

STATE CEQA GUIDELINES—APPENDIX G CHECKLIST QUESTIONS

With respect to GHG emissions, OPR has updated Appendix G of the State CEQA Guidelines to address impacts of GHG emissions, as directed by SB 97 (2007). The amendments became effective March 18, 2010. Although the amendments provide criteria to evaluate a project's GHG emissions, they do not establish quantitative significance thresholds. According to the revised Appendix G of the State CEQA Guidelines, an impact related to global climate change is considered significant if the proposed project (in this case, the proposed LRDP) would:

- 8a—generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- 8b—conflict with an applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

METHODOLOGY

OPR's Technical Advisory states, "Although climate change is ultimately a cumulative impact, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment. CEQA authorizes reliance on previously approved plans and mitigation programs that have adequately analyzed and mitigated GHG emissions to a less-than-significant level as a means to avoid or substantially reduce the cumulative impact of a project." OPR also states, "In determining whether a proposed

[15] IFC International. 2008 (August 1). *City and County of San Francisco: Community GHG Inventory Review*. San Francisco, CA. Prepared for City and County of San Francisco, Department of the Environment. San Francisco, CA.

project's emissions are cumulatively considerable, the lead agency must consider the impact of the project when viewed in connection with the effects of "past, current, and probable future projects."[16]

Direct and indirect GHG emissions associated with a proposed project are analyzed according to the recommendations of OPR's Technical Advisory.[17] In addition to GHG emissions sources recommended for quantification by the Technical Advisory (i.e., construction, electricity consumption, water consumption, area sources, and mobile sources), this analysis also quantifies the solid waste–related GHG emissions associated with the proposed LRDP. In the Technical Advisory, OPR recommends that "lead agencies under CEQA make a good-faith effort, based on available information, to estimate the quantity of GHG emissions that would be generated by a proposed project, including the emissions associated with vehicular traffic, energy consumption, water usage, solid waste disposal, and construction activities, to determine whether the impacts have the potential to result in a project or cumulative impact and to mitigate the impacts where feasible mitigation is available."

GHG emissions related to the proposed LRDP were calculated using guidance from the California Climate Action Registry (CCAR) and the Intergovernmental Panel on Climate Change. The GHG emissions inventory relied on scientific studies and studies conducted by government agencies that provide data on energy use patterns associated with building energy use, municipal activities, natural resources distribution, and other activities that would take place as part of the LRDP. The GHG emissions inventory was developed using several models to estimate GHG emissions from the LRDP. These include the OFFROAD2007[18] model, the EMFAC2007[19] model, and the URBEMIS[20] model.

This GHG emissions inventory identifies both the one-time construction emissions and annual operational emissions expected to occur each year after buildout of the proposed LRDP. Existing emissions associated with the former Cathedral Hill Hotel and the existing Pacific, Davies, and St. Luke's Campuses were tabulated and subtracted from proposed development emissions at the four campuses to determine the net change in emissions. This inventory assumes that all emissions from the proposed LRDP would be "new," in the sense that, absent the development of the LRDP, these emissions would not occur. Moreover, existing emissions associated with the California Campus were not subtracted from the LRDP's future GHG inventory; hence, the emissions presented here are conservative, that is, they are overestimates (more so because reductions in emissions at the California Campus are not credited against emissions at the Cathedral Hill Campus, where the majority of the services

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[16] Governor's Office of Planning and Research. 2008 (June). *Technical Advisory: CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review.* Available: http://opr.ca.gov/ceqa/pdfs/june08-ceqa.pdf. Last updated June 19, 2008. Accessed September 2009. Page 5.

[17] Ibid.

[18] California Air Resources Board Mobile Source Emissions Inventory Program. 2006 (December). Available: http://www.arb.ca.gov/msei/offroad/offroad.htm.

[19] California Air Resources Board. 2006 (November). Emission Factors (EMFAC2007) model (Version 2.3). Sacramento, CA. Available: http://www.arb.ca.gov/msei/onroad/latest_version.htm.

[20] Jones & Stokes Associates. 2008. Urban Emissions Model (URBEMIS) (Version 9.2.4). Prepared for South Coast Air Quality Management District. Available: http://www.urbemis.com.

currently offered at the California Campus would be relocated). Given the global nature of GHG emissions, “new” global GHG emissions are those caused by economic growth and population growth (births); local development projects accommodate such growth.

In addition, these emissions estimates assume that there would be no reductions in GHG-generating activities over time, other than from the Pavley rules (increased vehicle fuel efficiency standards) and the first phase of the Renewable Portfolio Standard. No reductions would be unlikely, considering that additional reductions in GHG emissions from most activities would take place over the years as a result of future regulations, greater public awareness, and likely increases in the cost of energy. These likely future reductions add to the conservative analysis.

The GHG emissions inventory includes some aspects that would be fully within the control of the proposed LRDP, such as grading and the placement of utilities. Certain aspects would be in control of the individuals constructing the buildings, such as construction emissions, while control over other aspects would be shared by the developers and future CPMC employees, patients, and visitors, such as energy use in the built environment and emissions from travel to and from the campuses. The time frame during which GHGs are emitted varies from category to category, and this also is taken into consideration in the emissions inventory. For most of the categories, GHGs would be emitted every year that the development is occupied. For these categories (i.e., buildings, mobile sources, municipal services, and area sources), the inventory includes estimates of annual GHG emissions from ongoing operations associated with the LRDP. GHG emissions from construction are one-time events that would not be part of the proposed development’s ongoing activity.

This emissions analysis considers the GHGs most likely to be emitted by the proposed LRDP: CO_2, N_2O, and CH_4. Emissions associated with leaks of high-global-warming-potential gases, such as from refrigeration leaks, were not quantified. At the entitlement stage of development, the uncertainty in the design of the refrigeration systems makes a meaningful quantification of GHG emissions difficult. In addition, because refrigeration systems would be new, they are likely efficient and should be designed to reduce the amount of leaks of gases with high Global Warming Potential (GWP).

Life-cycle emissions are not included in the inventory because these emissions would be accounted for under the California Global Warming Solutions Act of 2006 (AB 32) in other industry sectors. In addition, life-cycle analyses inherently involve many uncertainties. For example, in a life-cycle analysis for building materials, somewhat arbitrary boundaries must be drawn to define the processes considered in the life-cycle analysis. Although life-cycle emission estimates can provide a broader view of a project’s emissions, life-cycle analyses often double-count emissions that might be attributable to other sectors in a comprehensive analysis. Recognizing the uncertainties associated with a life-cycle analysis, the California Air Pollution Control Officers Association

(CAPCOA) released a white paper that states: "The full life-cycle of GHG emissions from construction activities is not accounted for in the modeling tools available, and the information needed to characterize GHG emissions from manufacture, transport, and end-of-life of construction materials would be speculative at the CEQA analysis level."[21]

PROJECT DESIGN FEATURES

Implementation of the proposed LRDP would involve several design features intended to reduce operational GHG emissions associated with electricity and natural gas usage, water-related energy use, and mobile source emissions.

Project Design Features Whose Emissions Reductions Were Incorporated into the Analysis

The following proposed LRDP design features, intended to reduce GHG emissions, were incorporated into the analysis:

- energy use reductions for the proposed Cathedral Hill Hospital and Cathedral Hill Medical Office Building (MOB), which reflect energy efficiency and reduction measures associated with CPMC's sustainability program;
- CPMC's commitment to 14% greater efficiency than Title 24 regulations for energy uses at the Cathedral Hill Hospital, St. Luke's Replacement Hospital,[22] and MOB/Expansion Building; and
- transportation demand management programs that offer incentives to employees for biking or using public transit for their work commutes, and disincentives to employees and visitors for driving to the campuses.

Project Design Features Whose Emissions Reductions Were Not Incorporated into the Analysis but Could Yield Further GHG Emissions Savings

The proposed LRDP would contain several design features that would have GHG-reduction benefits not quantified in the values presented in Tables 4.8-1 and 4.8-2 (pages 4.8-18 and 4.8-19, respectively). CPMC has committed to the following LRDP features intended to reduce GHG emissions:

- *Reduced water consumption:* A 50% reduction in landscaping and associated water consumption for irrigation at the proposed Cathedral Hill Hospital would reduce GHG emissions associated with water conveyance, distribution, and treatment. Information on the proportion of total water consumption attributed to irrigation was not available to quantify the reduction in GHG emissions.

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[21] California Air Pollution Control Officers Association. 2008. *CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act.* Sacramento, CA.

[22] Although Title 24 does not apply to hospitals, Title 24 was used as a benchmark to assess the hospital's energy efficiency based on CPMC's commitment to reduce energy usage at the hospital to a level equivalent to 14% below Title 24 energy efficiency requirements.

- *Construction waste recycling and landfill diversion:* At least 75% (and up to 90%) of construction debris from the site of the proposed Cathedral Hill Hospital would be recycled off-site instead of being hauled to a landfill. Recycled construction materials have lower embodied energies than the corresponding virgin material, and will result in lower embodied energy for the developments in which they are used.[23] Because this measure would reduce embodied energy and not direct emissions from the proposed development, the associated GHG reductions were not deducted from the development's operational emissions inventory.

- *Reduction in use of steel building materials by 25%:* The inclusion of viscous wall dampers in the design of the Cathedral Hill Hospital would reportedly reduce the impact of seismic vibrations on the building structure. Because of this, 25% less steel would be required relative to a similar building without these dampers. Steel has a relatively high embodied energy, and reducing steel usage would reduce the overall embodied energy of the hospital building. Because this measure would reduce embodied energy and not direct emissions from the proposed development, the associated GHG reductions were not deducted from the development's operational emissions inventory.

- *Green roof:* Approximately 25% of the total rooftop area at the Cathedral Hill Hospital and the associated Cathedral Hill MOB would be covered with a green roof. In addition to reducing the volume of stormwater sent to the sewer, the green roof would increase the site's carbon sequestration capacity relative to current conditions. At this time, however, insufficient data are available to quantify this.

- *Diversion of cooling tower water from wastewater treatment:* The efficient design of the Cathedral Hill Hospital's cooling-tower system would prevent approximately 98% of total cooling tower water from requiring wastewater treatment. The volume of cooling-tower water requiring treatment was not available to quantify the GHG impacts of this feature.

- *Refrigeration systems utilizing glycol:* The Cathedral Hill Hospital's large refrigeration systems would use glycol (a non-global-warming compound), and thus would require smaller amounts of refrigerant compounds, such as HFCs, than other types of systems. Lower usage of refrigerants with high GWPs (e.g., HFCs) would lower the associated emissions of these compounds in the atmosphere. Because estimates of refrigerant use, leakage, and associated GHG emissions would be speculative at this stage, they have not been quantified for this inventory.

[23] Embodied energy refers to the quantity of energy required by all of the activities associated with a production process for a particular material.

Table 4.8-1
Annual CPMC LRDP Construction Greenhouse Gas Emissions

Activity	CO_2 Emissions (metric tons/year) [a, b]
Cathedral Hill Campus	
Off-road equipment	3,963
Worker commuting	3,619
On-road truck hauling	1,005
Cathedral Hill Campus Total (Year of Maximum Emissions: 2013)	*8,587*
St. Luke's Campus	
Off-road equipment	493
Worker commuting	140
On-road truck hauling	169
St. Luke's Campus Total (Year of Maximum Emissions: 2012)	*802*
Pacific Campus	
Off-road equipment	5,280
Worker commuting	763
On-road truck hauling	1,399
Pacific Campus Total (Year of Maximum Emissions: 2018)	*7,442*
Davies Campus	
Off-road equipment	1,874
Worker commuting	239
On-road truck hauling	197
Davies Campus Total (Year of Maximum Emissions: 2019)	*2,311*
Maximum Total Unmitigated Annual Emissions, All Campuses (Near-Term, 2013)	9,623
Maximum Total Unmitigated Annual Emissions, All Campuses (Long-Term, 2018)	7,928

Notes: CO_2 = carbon dioxide; CPMC = California Pacific Medical Center; lb/day = pounds per day; LDRP = *Long Range Development Plan*

[a] For each campus, the total emissions from all construction activities for each year were quantified, and data for the year with the highest annual total (denoted in parentheses) is reported.

[b] The total values for each campus may not equal the sum of the emissions from each source due to rounding.

Source: Modeling performed by ENVIRON in 2010

Table 4.8-2
Net Change Greenhouse Gases Generated by Operations Under the Proposed LRDP at CPMC Campuses at Development Buildout (2030)

Source	Emissions ($MT/yr\ CO_2e$)[a, b]
Cathedral Hill	
Area sources[c]	425
Mobile sources[d]	7,545
Solid waste disposal	115
Energy (electricity generation and natural gas combustion)	11,017
Water consumption–related energy use	53
Total Cathedral Hill Campus Operational Emissions	*19,155*
St. Luke’s	
Area sources[c]	241
Mobile sources[d]	1,877
Solid waste disposal	22
Energy (electricity generation and natural gas combustion)	-1,051
Water consumption–related energy use	9
Total St. Luke’s Campus Operational Emissions	*1,099*
Pacific Campus	
Area sources[c]	-95
Mobile sources[d]	-1,790
Solid waste disposal	-39
Energy (electricity generation and natural gas combustion)	568
Water consumption–related energy use	-29
Total Pacific Campus Operational Emissions	*-1,385*
Davies	
Area sources[c]	175
Mobile sources[d]	1,579
Solid waste disposal	30
Energy (electricity generation and natural gas combustion)	551
Water consumption–related energy use	-1
Total Davies Campus Operational Emissions	*2,334*
Other GHG Emissions	
Nitrous oxide for anesthesia (all campuses)	1,300

Table 4.8-2
Net Change Greenhouse Gases Generated by Operations Under the Proposed LRDP at CPMC Campuses at Development Buildout (2030)

Source	Emissions (MT/yr CO_2e)[a, b]
Summary	
Net Increase in GHG Emissions Resulting from Proposed LRDP (year 2030)	22,503
Net Increase in 2030 Service Population	3,819
GHG/SP of Proposed LRDP	5.9

Notes: CO_2e = carbon dioxide equivalent; CPMC = California Pacific Medical Center; GHG = greenhouse gas; LDRP = *Long Range Development Plan*; MT/yr = metric tons per year; SP = Service Population.

[a] Emissions modeled using the URBEMIS 2007 (Version 9.2.4) computer model, based on trip generation rates obtained from the analysis prepared for the proposed LRDP; proposed land uses identified in Chapter 2, "Project Description," and Section 4.5, "Transportation and Circulation," of this EIR; recommendations from the Bay Area Air Quality Management District for URBEMIS model inputs; and default model assumptions where detailed information was not available.

[b] Negative values indicate a net reduction in emissions compared to existing conditions.

[c] Trip generation rates were obtained from the traffic analysis for the respective land uses. (Adavant Consulting. 2010 [April]. *Final Travel Demand Estimations for the San Francisco Campuses.* San Francisco, CA.)

[d] Totals may not add exactly due to rounding.

Sources: Data modeled by AECOM in 2009; ENVIRON in 2010.

- *Anesthetic gas scavenging system (proposed):* Anesthetic gases, such as N_2O, isoflurane, sevoflurane, and desflurane have very high GWPs. In typical hospital operations, anesthetic gases are vented after use, releasing GHGs. CPMC is investigating the feasibility of installing scavenging systems at Cathedral Hill for anesthetic gases, which would help reduce or eliminate their emission. Although analysis of GHG emissions associated with N_2O anesthetic gas usage has been included in the inventory, emissions associated with proposed alternative gas usage, and emissions reductions associated with proposed scavenging systems, were not quantified because both would be speculative at this stage.

4.8.5 IMPACT EVALUATIONS

IMPACT GH-1 *Direct and indirect CPMC LRDP-generated GHG emissions would not have a significant impact on the environment, nor would they conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions (1999 BAAQMD Guidelines). (Significance Criteria 8a and 8b)*

Levels of significance:

- *Cathedral Hill: Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's: Less than significant*

Near-Term Projects and Long-Term Projects

◆ All Campuses Except California Campus

SHORT-TERM CONSTRUCTION EMISSIONS

Construction-related GHG emissions were modeled using the ARB-approved Off-Road and On-Road Mobile-Source Emission Factor models (OFFROAD2007[24] and EMFAC2007,[25] respectively) and methodology from the Urban Emissions (URBEMIS) 2007 Version 9.2.4 computer model.[26] OFFROAD2007 is an emissions factor model used to calculate emission rates from off-road mobile sources (e.g., construction equipment). EMFAC2007 is an emissions factor model used to calculate emissions rates from on-road vehicles (e.g., passenger vehicles, haul trucks). URBEMIS is designed to model construction emissions for land use development projects and allows for the input of project-specific information. Assumptions regarding construction timing and the number, type, and operating hours of equipment are based on the number and type of equipment that would be used in the construction of the project, as well as the duration of the different construction phases. These assumptions are used with CO_2-specific emission factors compiled in OFFROAD 2007 and EMFAC2007. The construction GHG emissions estimate does not include emissions from construction-related electricity or natural gas consumption. Construction-related electricity and natural gas emissions vary based on the amount of electric power used during

[24] California Air Resources Board. 2006 (December). Mobile Source Emissions Inventory Program. Sacramento, CA. Available: http://www.arb.ca.gov/msei/offroad/offroad.htm.

[25] California Air Resources Board. 2006 (November). Emission Factors (EMFAC2007) model (Version 2.3). Sacramento, CA. Available: http://www.arb.ca.gov/msei/onroad/latest_version.htm.

[26] Jones & Stokes Associates. 2008. Urban Emissions Model (URBEMIS) (Version 9.2.4). Sacramento, CA. Prepared for South Coast Air Quality Management District. Available: http://www.urbemis.com.

construction and other unknown factors that make them too speculative to quantify. In addition, this is typically a relatively small contribution to GHG emissions during construction.

Table 4.8-1, "Annual Project Construction Greenhouse Gas Emissions" (page 4.8-18), presents the emission estimates in metric tons (MT) of CO_2. The table indicates that the total maximum annual construction-related emissions for the proposed LRDP are an estimated 9,623 MT CO_2e.[27] No agency has established thresholds of significance for construction-related GHG emissions. Although extensive demolition and excavation activities would be required, the proposed construction activities would be temporary and would cease in 2020 following completion of the proposed LRDP. Best management practices (BMPs) would be implemented during construction as part of CPMC's construction management plan. These BMPs would reduce GHG emissions through use of alternative-fueled (e.g., biodiesel, electric) construction vehicles and equipment to the extent feasible, use of at least 10% local building materials, and recycling of at least 50% of construction waste and demolition materials. It should be noted that the use of local building materials and recycling of demolition materials would result in a reduction of life-cycle GHG emissions and not direct GHG emission reductions by the proposed LRDP. Therefore, the reductions have been discussed qualitatively and no quantitative emission reductions have been calculated for these measures as part of this analysis.

The proposed LRDP would also be required to comply with the Construction and Demolition Debris Recovery Ordinance and the Green Building Ordinance. These ordinances have been adopted by the City as part of its GHG Reduction Strategy, which furthers the state's efforts to reduce GHG emissions as mandated by AB 32. Accordingly, the proposed LRDP's compliance with the City's construction-related ordinances also makes it consistent with the GHG reduction goals of AB 32. The Construction and Demolition Debris Recovery Ordinance requires the contractor to divert at least 65% of the construction and demolition debris from landfills. The Green Building Ordinance requires the Cathedral Hill MOB and the St. Luke's MOB/Expansion Building, as well as the buildings proposed to be constructed in the long term at the Pacific and Davies Campuses, to achieve a LEED® Silver certification. Although the proposed Cathedral Hill Hospital and St. Luke's Replacement Hospital would not be subject to the Green Building Ordinance, CPMC intends to attain LEED® certification for these buildings. As part of that LEED® certification, CPMC has proposed measures designed to reduce GHG emissions from construction activities. These measures include the diversion of at least 75% of construction waste from landfills, exceeding the requirements of the Construction and Demolition Debris Recovery Ordinance. It should be noted that the 75% diversion rate is also a requirement of the Green Building Ordinance. This measure would reduce the amount of GHG emissions generated as a result of the proposed LRDP's construction waste and allow the construction and demolition materials to be potentially recycled for future developments. As part of the LEED® measures, the proposed LRDP would also use recycled contents for 20% of the building materials. By using

[27] AECOM. 2010 (May). CPMC LRDP EIR URBEMIS Data Sheets. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available as part of the project file, in Case No. 2005.0555E.

recycled materials, the proposed development would reduce the amount of energy consumed to extract and process virgin raw construction materials. As discussed above, these ordinances and LEED® certifications would reduce life-cycle GHG emissions, which are not analyzed as part of this analysis. Nevertheless, the proposed LRDP would comply with these ordinances, which also further the goals of AB 32. Therefore, the proposed development would be consistent with both San Francisco's GHG Reduction Strategy and ARB's *Climate Change Scoping Plan*.

CPMC's commitment to achieve LEED® certification for the buildings identified above is consistent with the strategies of the *Climate Change Scoping Plan*, which uses LEED® certification as a tool for buildings to meet the goals of AB 32. The San Francisco GHG Reduction Strategy cites the expansion of construction and demolition waste recycling as an action to meet solid waste GHG reduction goals. As discussed above, the proposed LRDP construction waste diversion rate would exceed that of the Construction and Demolition Debris Recovery Ordinance. Although the proposed development would emit GHG emissions during construction, the development would be required to comply with applicable City regulations that reduce the development's construction-related contribution to GHG emissions. Therefore, implementation of the proposed LRDP would not generate GHG emissions that would have a significant impact on the environment, and the proposed development would not conflict with a plan, policy, or regulation developed for the purpose of reducing GHG emissions. **The impact of the proposed LRDP's construction-related GHG emissions would be less than significant.**

Long-Term Operational Emissions

Long-term operational or annual emissions from the development of the proposed LRDP would include indirect GHG emissions from electricity use in buildings, emissions from natural gas combustion used in buildings, mobile sources, municipal sources, area sources, and waste disposal. Table 4.8-2, "Net Change Greenhouse Gases Generated by Operations Under the Proposed LRDP at CPMC Campuses at Development Buildout [2030]" (page 4.8-19), lists the emissions for each of these categories.

Building Energy-Use Emissions

GHGs are emitted as a result of activities in buildings for which electricity and natural gas are used as energy sources.[28] The emissions presented reflect the net change in emissions associated with the proposed LRDP; emissions associated with land uses that would be removed (e.g., residences, hotel and office space) were subtracted from the predicted new emissions for the proposed development.

The analysis involved estimating electricity and natural-gas use associated with both removed and new buildings, and estimating GHG emissions averted and generated from the removed and new buildings, respectively.

[28] AECOM. 2010 (May). CPMC LRDP EIR URBEMIS Data Sheets. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available as part of the project file, in Case No. 2005.0555E.

Although fuel combustion generates CH_4 and N_2O, the emissions of these GHGs typically make up less than 1% of CO_2e emissions from natural gas consumption. As such, these minor emissions are not accounted for in this analysis.

ENVIRON obtained building energy modeling data for the proposed Cathedral Hill MOB that incorporates the impact of commitments to energy efficiency. For the remaining proposed buildings, ENVIRON estimated energy use using data on the square footage of these proposed buildings and energy use intensities from the 2002 California Commercial Building Energy Use Survey. Energy use at the St. Luke's Campus was adjusted to reflect a commitment to a 14% improvement in Title 24–regulated energy efficiency at both the St. Luke's Replacement Hospital[29] and MOB/Expansion Building. Finally, the GHG emissions for electricity use were estimated using appropriate the CO_2 emission factor from the most recent (2008) Pacific Gas & Electric Company Power/Utility Reporting Protocol report, which was adjusted to incorporate the 20% California Renewable Portfolio Standard required by 2010. Estimates of CO_2, CH_4, and N_2O emissions associated with electricity consumption were obtained from CCAR's General Reporting Protocol. The emission factor for natural gas was also obtained from CCAR's General Reporting Protocol.

Mobile-Source (Passenger Vehicle) Emissions

The passenger vehicle mobile-source emissions considered for the proposed LRDP would result from the typical daily operation of motor vehicles by staff, patients, and visitors. GHG emissions associated with passenger vehicle mobile sources were estimated by multiplying total net new vehicle miles traveled (VMT) by appropriate emissions factors. AECOM used URBEMIS to estimate total new VMT to be generated by the proposed LRDP, and the resulting GHG emissions. For mobile sources, CH_4 and N_2O are explicitly calculated, multiplied by their respective GWP, and added to the CO_2 emissions, to result in total CO_2e emissions from mobile sources.[30]

Total VMT were calculated by multiplying the number of trips by the average trip length for each type of trip. Vehicle trip counts were obtained from the traffic analyses prepared for each campus. URBEMIS default values for trip-type percentages (e.g., commuting, nonwork, customer) and their corresponding urban trip lengths were used to determine total mileage.

URBEMIS estimated CO_2 emissions from mobile sources using emission factors for running and starting emissions from EMFAC2007, based on the default fleet mix for San Francisco City and County in 2030 (which is the buildout year used in the traffic impact analyses). ENVIRON adjusted the emissions factors to account for

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29 Hospitals are not subject to Title 24 building efficiency regulations. However, for this discussion, the hospital's baseline energy use is defined as the energy use for a minimally 2005 Title 24–compliant building, owing to CPMC's commitment to reduce energy use at the proposed St. Luke's Replacement Hospital to a level equivalent to 14% below 2005 Title 24.

30 AECOM. 2010 (May). CPMC LRDP EIR URBEMIS Data Sheets. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available as part of the project file, in Case No. 2005.0555E.

Pavley Vehicle Standards.[31] N_2O, CH_4, and HFCs are also emitted from mobile sources. EPA recommends assuming that CH_4, N_2O, and HFCs account for 5% of mobile source GHG emissions, taking into account their GWPs. Therefore, CO_2 emissions were divided by 0.95 to account for non-CO_2 GHGs.

Mobile-Source (Delivery Vehicle) Emissions

Mobile-source emissions would also be generated by the various types of delivery vehicles and waste hauling trucks that visit the campuses. Based on a 2008 truck study and on the traffic impact analyses performed for the proposed Cathedral Hill Campus and the existing campuses, the total number of delivery vehicles that visit the campuses would not increase under the proposed LRDP.[32] The delivery vehicles that would visit the proposed Cathedral Hill Campus would have formerly visited either the Pacific Campus or the California Campus. These vehicles would be diverted to the proposed Cathedral Hill Campus after programs have transferred there from the Pacific and California Campuses. In addition, a number of truck trips would be eliminated by the colocation of Pacific Campus and California Campus services at the proposed Cathedral Hill Campus. This reduction in truck trips would offset the slight increases in truck trips at the Davies and St. Luke's Campuses under the proposed LRDP. Assuming that no change would occur in the overall fleet mix of delivery vehicles visiting the campuses, and that the distances traveled by the delivery vehicles would not change, there would be no net increase in GHG emissions relative to existing conditions from delivery vehicles that frequent the campuses. Because there would be no net increase, these emissions were not quantified for this analysis.

Water- and Wastewater-Related Emissions

In general, the majority of municipal-sector GHG emissions are related to the energy used to convey, treat, and distribute water and wastewater. These emissions are generally indirect emissions from the production of electricity to power these systems. Additional emissions from wastewater treatment include CH_4 and N_2O, which are emitted directly from the wastewater. Wastewater-treatment emissions from the proposed LRDP are estimated to account for zero tons of CO_2e emissions per year because all CH_4 emissions from the wastewater at the Southeast Wastewater Treatment Plant are burned at the flare station or cogeneration plant and nonmethane emissions are directly emitted from the wastewater, as directed by the plant's air permit.

The amount of electricity required to treat and supply water depends on the volume of water involved. Total annual existing and future water demand information was provided by BKF Engineers, and was used to estimate

[31] AECOM. 2010 (May). CPMC LRDP EIR URBEMIS Data Sheets. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available as part of the project file, in Case No. 2005.0555E.

[32] California Pacific Medical Center. 2010 (April). *CPMC Cathedral Hill Campus Truck Loading Demand Estimation and Management Plan*. San Francisco, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available as part of the project file, in Case No. 2005.0555E.

the net change in water volume for each campus.[33] A California Energy Commission electricity intensity factor (i.e., kilowatt-hours/million gallons/year) was applied to estimate the electricity consumption associated with water use. Electricity consumption emissions factors for CO_2, CH_4, and N_2O from CCAR's General Reporting Protocol were used to estimate metric tons of CO_2e associated with water-related electricity consumption.[34]

Area Source Emissions

Area sources of GHG emissions can include combustion-fueled landscaping equipment, fireplaces, hearths, and usage of natural gas. For this inventory, emissions associated with natural-gas usage have been evaluated in the building energy use analysis, and no fireplaces or hearths are included in the proposed LRDP; therefore, only area-source emissions from landscaping equipment were quantified. AECOM used URBEMIS to estimate CO_2 emissions from landscaping equipment; this value was multiplied by 105%[35] to include the estimated CH_4 and N_2O emissions resulting from equipment fuel combustion.

Solid-Waste Disposal Emissions

Operations under the proposed LRDP would generate waste, of which a large percentage would be diverted from landfills by waste reduction, recycling, or composting. San Francisco diverts a large portion of its generated waste and has established goals to further reduce the amount of waste sent to landfills. Nonhazardous waste would be disposed at a landfill. Landfills emit GHG emissions associated with the anaerobic breakdown of material. The net change in annual waste disposal between 2006 (which is used to describe existing conditions in this context) and 2030 was estimated using waste generation and recycling data provided by BKF Engineers.[36] The annual waste disposal rates were multiplied by the nonbiogenic[37] emissions associated with the Altamont Landfill in 2005, which is 0.00674 MT of CO_2e emissions per ton of waste per year. These estimates are likely conservative given the fact that future employees and visitors would be more conscious of waste and because of San Francisco's aggressive goals for waste reduction. In addition, this estimate does not account for the carbon sequestration that would occur as a result of disposal of carbon that would not degrade in the landfill.[38]

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[33] BKF Engineers. 2010 (March 1). CPMC LRDP EIR Existing and Forecasted Demand for Community Services Questions: CS-1, CS-2, CS-5, CS-6. Pleasanton, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available as part of the project file, in Case No. 2005.0555E.

[34] The CCAR electricity consumption factors are greater than the Pacific Gas & Electric Company–specific factor and have not been adjusted for the Renewable Portfolio Standard. This will provide a conservative (i.e., overestimated) estimate for water-related emissions.

[35] It was assumed that CH_4 and N_2O add an additional 5% to the CO_2e landscaping equipment, consistent with the assumption used for gasoline-powered automobiles.

[36] BKF Engineers. 2010 (March 1). CPMC LRDP EIR Existing and Forecasted Demand for Community Services Questions: CS-1, CS-2, CS-5, CS-6. Pleasanton, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available as part of the project file, in Case No. 2005.0555E.

[37] GHG emissions associated with the treatment of hazardous and medical waste were not evaluated here. The emissions associated with such waste treatment are small, as the relative waste fractions for hazardous and medical waste are also correspondingly small.

[38] GHG emissions from waste hauling trucks were considered in combination with all other delivery vehicles.

Other Emissions: Nitrous Oxide from Anesthetic Gases

N_2O is used as an anesthetic gas for medical procedures, and is itself a GHG. ENVIRON estimated GHG emissions using N_2O usage records for 2009 at CPMC's existing campuses (Pacific, Davies, California, and St. Luke's), with the assumption that the future amount used at the Cathedral Hill, Pacific, Davies, and St. Luke's Campuses would be similar to the 2009 usage rates at the four currently existing campuses. ENVIRON also conservatively assumed that all of the N_2O used would be released to the atmosphere. Because of its high GWP, the annual N_2O usage rate of 9,162 pounds translates to approximately 1,300 MT of CO_2e per year (1,300 MT CO_2e/yr).

Total Annual Project Carbon Dioxide Emissions

The total annual GHG emissions generated from operations under the proposed LRDP for the source categories quantified above would be approximately 22,503 tons CO_2e per year. Table 4.8-2 reveals that the majority of annual development emissions would be the result of building energy consumption (49%), followed by vehicle use (41%).

Once the proposed LRDP is completed, the development would be required to comply with San Francisco's GHG Reduction Strategy, which would reduce GHG emissions associated with transportation, solid waste, and energy consumption. Given that the City has adopted numerous GHG reduction strategies recommended in the *Climate Change Scoping Plan*; that the City's GHG Reduction Strategy includes binding, enforceable measures to be applied to development projects, such as the proposed LRDP; and that the City's GHG Reduction Strategy has produced measurable reductions in GHG emissions, the proposed LRDP would not conflict with either the state or local GHG reduction strategy. In addition, the proposed LRDP would not conflict with any plans, policies, or regulations adopted for the purpose of reducing GHG emissions.

When evaluating the proposed LRDP's consistency with the *Climate Change Scoping Plan* and the San Francisco GHG Reduction Strategy, it is important to consider the transportation and energy efficiency aspects of the proposed development, which account for approximately 79% of the development's total operational GHG emissions. Both the *Climate Change Scoping Plan* and the San Francisco GHG Reduction Strategy cite increasing use of alternative modes of transportation, such as walking, bicycling, and public transit, as a major strategy to reduce transportation-related GHG emissions. The availability of multiple public transportation options (i.e., San Francisco Municipal Railway, Bay Area Rapid Transit, Caltrain, Amtrak) provides people with the ability to travel locally, as well as regionally, using public transit, thereby reducing potential transportation-related GHG emissions. Therefore, staff, patients, and visitors traveling to CPMC campuses would be provided with multimodal transportation options that could reduce transportation-related GHG emissions.

In addition, the LRDP's proposal for LEED®-certified design of the Cathedral Hill Hospital, Cathedral Hill MOB, St. Luke's Replacement Hospital, and St. Luke's MOB/Expansion Building, and the requirement that the buildings proposed as long-term developments at the Davies and Pacific Campuses achieve LEED® Silver certification, would be consistent with the goals and strategies of the *Climate Change Scoping Plan* and the San Francisco GHG Reduction Strategy. As discussed above, the *Climate Change Scoping Plan* identifies LEED® certification as a tool used to meet the energy efficiency goals of AB 32. The San Francisco GHG Reduction Strategy identifies increasing energy efficiency in residential and commercial buildings as a strategy to achieve its GHG reduction goal. The proposed LRDP includes LEED® features that would reduce the direct and indirect GHG emissions associated with operation of the LRDP, compared with standard building methods and the existing structures proposed for demolition. In addition, indoor and outdoor water consumption would be reduced through LEED® features. Considering this information, and the fact that the proposed LRDP involves infill development with multiple alternative modes of transportation for staff, patients, and visitors, the proposed development would be consistent with the San Francisco GHG Reduction Strategy and the *Climate Change Scoping Plan* because it would not impede implementation of the GHG reduction goals established by the City or AB 32, respectively.

AB 32 contains a comprehensive approach for developing regulations to reduce statewide GHG emissions. ARB acknowledges that decisions on how land is used will have large effects on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas sectors. Many of the measures in the *Climate Change Scoping Plan*—such as implementation of increased fuel efficiency for vehicles (the "Pavley" standards), increased efficiency in utility operations, and development of more renewable energy sources—require statewide action by government, industry, or both.

Some of the *Climate Change Scoping Plan* measures are at least partially applicable to development projects, such as increasing energy efficiency in new construction and a "green building" strategy. As shown above, the City has already implemented several of the measures that require local government action to realize meaningful reductions in GHG emissions, including a Green Building Ordinance, a Zero Waste strategy, a Construction and Demolition Debris Recovery Ordinance, and a solar energy generation subsidy program. The City's GHG Reduction Strategy also furthers the state's efforts to reduce statewide GHG emissions, as mandated by AB 32. The proposed LRDP would be consistent with the City's GHG Reduction Strategy and *Climate Change Scoping Plan*, which are the plans applicable to reducing GHG emission in the city and state, respectively. **Therefore, the proposed LRDP would have a less-than-significant impact with respect to operational GHG emissions.**

Mitigation Measure: No mitigation or improvement measures are required at any of the campuses in the near term or long term.

IMPACT EVALUATIONS BASED ON RECENTLY ADOPTED BAAQMD SIGNIFICANCE CRITERIA FOR GREENHOUSE GASES

In May 2010, BAAQMD released the most recent version of its proposed *California Environmental Quality Act Air Quality Guidelines*, which includes qualitative and quantitative thresholds of significance for GHG emissions. It also recommended guidance for the analysis of operational GHG emissions that is consistent with guidance from OPR's Technical Advisory for addressing climate change through CEQA review.[39] On June 2, 2010, the BAAQMD Board of Directors adopted the *Proposed Air Quality CEQA Thresholds of Significance* presented in Table 2-1 of the above-referenced May 2010 BAAQMD CEQA air quality guidelines. BAAQMD's adoption of its revised CEQA significance thresholds is pioneering in that they are the only adopted CEQA thresholds for GHGs statewide. However, according to the final resolution, the adopted GHG thresholds are intended to apply only to those projects for which environmental analyses have begun on or after the June 2, 2010, adoption date. Although the recently adopted GHG thresholds are not intended to apply to the proposed LRDP, in anticipation of adoption of these thresholds, an analysis was performed of the proposed development's impacts with respect to the recently adopted CEQA thresholds for GHGs.

According to the Recently Adopted *Air Quality CEQA Thresholds of Significance*, long-term operational emissions of GHGs from an individual land use development project (e.g., residential, commercial) would result in a cumulatively considerable contribution of GHG emissions and a significant impact related to global climate change if:

- the proposed LRDP would be inconsistent with a qualified climate action plan or program,[40]
- operation-related GHG emissions would exceed 1,100 MT of carbon dioxide equivalent per year ($MTCO_2e$/yr), or
- the GHG efficiency of the proposed LRDP would be greater than 4.6 $MTCO_2e$/yr per service population (SP).[41]

GHG emissions under the proposed LRDP were evaluated with guidance from the Recently Adopted BAAQMD *Air Quality CEQA Thresholds of Significance*. BAAQMD suggests quantifying direct and/or indirect emissions

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[39] Governor's Office of Planning and Research. 2008. *Technical Advisory: CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review.* Available: http://opr.ca.gov/ceqa/pdfs/june08-ceqa.pdf. Last updated June 19, 2008. Accessed July 2009.

[40] According to BAAQMD, a "qualified climate action plan or program" should including the following: a GHG inventory for base year and GHG emissions projections; an adopted GHG reduction goal for 2020 that aligns with the goals of AB 32; identification of GHG reduction measures that would achieve the target; application of relevant reduction measures included in the Climate Change Scoping Plan; quantification of the GHG reductions of each measure and disclosure of calculation assumptions and methods; identification of implementation steps, responsible parties, and financing mechanisms; monitoring and updating procedures; and be accompanied by a certified CEQA document or adopted in an equivalent public review process.

[41] Service population is defined as the number of jobs plus the number of residents supported by a proposed project.

associated with electricity consumption, mobile sources, water consumption and wastewater, solid waste,[42] area sources (natural gas usage, hearths, landscaping equipment), industrial processes, and fugitive emissions. The guidance recommends generalized emission factors, which do not account for local electricity emission factors or newer vehicle efficiency regulations. The operational emissions estimated for the proposed development utilized different emission factors and methodologies, such as the carbon intensity used for electricity, estimates of building energy use, and vehicle emission factors. The methodologies presented in this EIR for quantification of GHG operational emissions are based on more refined data sources than indicated in the BAAQMD guidance, and are the most appropriate to use for the proposed LRDP.

IMPACT GH-2

CPMC LRDP construction-related GHG emissions would not have a significant impact on the environment, nor conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions (Recently adopted BAAQMD Guidelines). (Significance Criteria 8a and 8b)

Levels of significance:

- *Cathedral Hill: Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's: Less than significant*

Near-Term Projects and Long-Term Projects

◆ All Campuses Except California Campus

BAAQMD has not proposed or adopted a quantitative threshold of significance for construction-related GHG emissions. However, the recently adopted *California Environmental Quality Act Air Quality Guidelines* recommend that the proposed LRDP's construction-related GHG emissions be quantified and state that the lead agency should attempt to make a significance determination in the absence of a numeric significance threshold.

The proposed LRDP's construction-related GHG emissions would be temporary and would cease following buildout of the proposed development. In addition, the project would implement all BAAQMD-recommended BMPs, the Dust and Demolition Debris Recovery Ordinance, and LEED® measures related to reducing construction-related GHG emissions. Therefore, construction-related GHG emissions would not be considered

[42] The recently adopted BAAQMD guidelines are currently unclear as to whether emissions associated with waste are to be included in the efficiency metric.

cumulatively considerable. Based on the recently adopted BAAQMD *Air Quality CEQA Thresholds of Significance*, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at any of the campuses in the near term or long term.

IMPACT GH-3

Direct and indirect CPMC LRDP–generated GHG emissions would have a significant impact on the environment or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions (Recently adopted BAAQMD Guidelines). (Significance Criteria 8a and 8b)

Levels of significance:

- *Cathedral Hill: Significant and unavoidable*
- *Pacific: Significant and unavoidable*
- *Davies (near term and long term): Significant and unavoidable*
- *St. Luke's: Significant and unavoidable*

Near-Term Projects and Long-Term Projects

◆ All Campuses Except California Campus

As described previously, the proposed LRDP would be required to comply with San Francisco's GHG Reduction Strategy, which would reduce operational GHG emissions. Given that the City's GHG Reduction Strategy adopts numerous GHG reduction strategies recommended in the *Climate Change Scoping Plan*; that it includes binding, enforceable measures to be applied to development projects; and that the strategy has produced measurable reductions in GHG emissions, the proposed LRDP would be consistent with state and local GHG reduction strategies. In addition, the proposed LRDP would not conflict with any plans, policies, or regulations adopted for the purpose of reducing GHG emissions.

As shown in Table 4.8-2, the proposed LRDP's net operational GHG emissions would be approximately 22,503 $MTCO_2e$/yr, which exceeds BAAQMD's recently adopted GHG emissions threshold of 1,100 $MTCO_2e$/yr. In addition, a net increase in SP of nearly 3,819 full-time or full-time equivalent employees (i.e., the average number of employees and volunteers on a given work day) would result in a GHG-efficiency value of 5.9 $MTCO_2e$/SP/yr. The proposed LRDP would be above BAAQMD's recently adopted GHG efficiency criterion of 4.6 $MTCO_2e$/SP/yr for project-level analysis. Therefore, **this impact would be significant**.

Although this proposed LRDP exceeds the efficiency metric of 4.6 $MTCO_2e$/SP/yr, additional factors were considered. First, it was not clear whether the BAAQMD efficiency metric applies to facilities such as hotels and hospitals, whose large numbers of visitors are not included in the service population (which includes employees and residents only). Second, as noted in this section, several sustainability attributes would serve to reduce GHGs that were not accounted for because of the unavailability of sufficient methodologies to accurately account associated GHG emission reductions.

It is not likely that additional increases in the energy savings and sustainability goals would be able to reduce emissions below BAAQMD's significance criteria. Accordingly, **this impact would remain significant and unavoidable, based on BAAQMD's recently adopted GHG thresholds.**

4.9 WIND AND SHADOW

This section describes wind and shadow conditions in San Francisco in general and on the various existing and proposed CPMC campuses in particular. It evaluates potential wind and shadow impacts that could result from implementation of the CPMC *Long Range Development Plan* (LRDP) and considers cumulative impacts of both wind and shadow. Specifically, this section describes project-related wind impacts in relation to the criteria for pedestrian comfort, sitting area comfort, and wind hazards adopted by the City and County of San Francisco (City). It also discusses shadow impacts on public parks, publicly accessible private open spaces, and sidewalks.

4.9.1 ENVIRONMENTAL SETTING

WIND

The description of wind conditions is focused on the street-level environment. Wind conditions affect pedestrian comfort on sidewalks and in other public areas. In downtown areas, high-rise buildings can redirect wind flows around buildings and divert winds downward to street level; both of these conditions can result in increased wind speed and turbulence at street level. Pedestrian comfort varies under different conditions of sun exposure, temperature, clothing, and wind speed. Winds up to 4 miles per hour (mph) have no noticeable effect on pedestrian comfort. At speeds of 4–8 mph, wind is felt on the face. Winds of 8–13 mph will disturb hair, cause clothing to flap, and extend a light flag mounted on a pole. Winds from 13 to 19 mph will raise loose paper, dust, and dry soil, and will disarrange hair. At speeds of 19–26 mph, the force of the wind will be felt on the body. At wind speeds of 26–34 mph, umbrellas are used with difficulty, hair is blown straight, there is difficulty in walking steadily, and wind noise is unpleasant. Winds exceeding 34 mph increase difficulty with balance and gusts can blow people over.[1]

Long-term wind data for San Francisco are available in historic wind records from the U.S. Weather Bureau’s weather station, located above the old Federal Building at 50 United Nations Plaza. Table 4.9-1, “Seasonal Frequency of Wind Directions (percent) and Average Wind Speeds (knots),” shows that average wind speeds in San Francisco are highest in the summer and lowest in the autumn. The highest peak wind speeds occur during the winter, when speeds of up to 47 mph have been recorded. Calm conditions occur about 2% of the time. Winds also exhibit a diurnal variation,[2] with the strongest winds in the afternoon and lightest winds in the early morning.

Wind direction refers to the direction from which the wind blows (e.g., a west wind blows from the west toward the east). Winds in San Francisco blow most frequently from the west-northwest direction, reflecting the flow of sea breezes. Wind direction is most variable in the winter. During the approach of a winter storm the strongest winds are typically from the south, although south winds are not as frequent in San Francisco as west winds. The

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[1] Arens, E. 1981. Designing for Acceptable Wind Environment. *Transactions Engineering Journal*, ASCE 107, No. TE 2. Pages 127–141.

[2] Diurnal wind variation is the change in wind direction that occurs throughout the day.

maximum wind velocities are commonly associated with winter storms, but the average wind speeds are slightly less than summer winds. Summer winds tend to be from the west to northwest and are associated with the incursion of the cool marine layer winds that are strongest in the midafternoon and subside in the evening. Summertime winds achieve the highest average wind speeds in San Francisco (e.g., see July data in Table 4.9-1).

Table 4.9-1
Seasonal Frequency of Wind Directions (percent) and Average Wind Speeds (knots)[1]

Direction	January		April		July		October		Annual	
	Freq.	Speed	Freq.	Speed	Freq.	Speed	Freq.	Speed	Freq.	Speed
North	12.5	7.9	2.2	11.0	0.3	6.0	3.3	6.6	5.0	7.2
North-northeast	1.3	5.6	0.7	6.1	0.3	6.8	0.7	6.6	0.8	6.0
Northeast	4.5	5.3	1.3	4.7	1.1	7.4	2.2	5.8	1.9	5.6
East-northeast	1.4	6.3	0.6	4.8	0.2	5.1	0.8	5.1	0.8	5.6
East	11.9	4.8	2.6	4.5	0.1	3.9	4.8	4.5	4.8	5.0
East-southeast	2.1	6.4	0.3	5.2	0.1	2.5	0.6	5.8	0.8	5.8
Southeast	9.1	6.4	2.4	7.8	0.2	5.0	3.7	6.6	4.2	6.8
South-southeast	2.8	5.6	0.3	3.8	0.1	3.0	1.3	9.0	1.2	6.4
South	6.7	5.0	4.2	7.1	1.1	4.9	4.5	7.5	4.1	6.4
South-southwest	1.0	4.8	0.4	4.1	0.1	3.0	1.7	12.8	0.9	8.6
Southwest	4.5	8.0	7.7	9.2	15.6	10.1	7.8	9.1	9.3	9.3
West-southwest	1.0	5.9	1.7	7.7	1.2	8.1	2.8	8.8	2.4	8.6
West	13.2	7.2	43.0	10.9	53.0	13.1	34.6	9.1	35.7	10.9
West-northwest	7.5	11.1	20.7	14.1	14.9	14.5	15.2	10.9	13.8	12.7
Northwest	11.5	7.7	9.3	10.7	10.7	11.4	10.8	8.5	10.0	9.7
North-northwest	1.2	5.7	0.6	10.8	0.6	8.5	0.5	7.5	0.7	8.3
Calm	7.7	–	2.1	–	0.3	–	4.6	–	3.7	–

Notes: Freq. = frequency
[1] A knot is a unit of speed representing 1 nautical mile per hour, approximately equal to 1.151 miles per hour.
Source: Null, E. J. 1978. *Climate of San Francisco*. NOAA Technical Memorandum NWS WR-126. Washington, DC: National Oceanic and Atmospheric Administration, National Weather Service.

Wind speeds within cities vary at pedestrian levels. In San Francisco, wind strength is generally greater along streets that run approximately east-west because buildings along those streets tend to act as a channel for winds. Streets running north-south generally have lighter winds, on average, because of the shelter offered by buildings located on the west side of the street.

BUILDING AERODYNAMICS

Ground-level wind accelerations near buildings are controlled by exposure, massing, and orientation. Exposure is a measure of the extent to which the building extends above surrounding structures into the wind stream.
A building that is surrounded by taller structures is not likely to cause adverse wind accelerations at ground level, while even a comparatively small building at 100 feet tall could cause wind effects if it were freestanding and exposed. Massing is important in determining wind effects because it controls how much wind is intercepted by the structure and whether building-generated wind accelerations occur above ground or at ground level. In general, slab-shaped buildings have the greatest potential for wind acceleration effects. Buildings that have an unusual shape or rounded faces or that utilize setbacks have a lesser wind effect. A general rule is that the more complex the building is geometrically (varying wall planes), the lesser the probable wind effect at ground level.

Building orientation determines how much wind is intercepted and deflected by the structure, factors that directly determine wind acceleration. In general, buildings with a longer axis oriented across (obstructing) the prevailing wind direction have greater effects on ground-level winds than buildings whose longer axis is oriented along the prevailing wind direction. The massing of tall buildings on either side of a street can create a canyon-like effect that concentrates winds at street level, particularly where street orientation is parallel to the prevailing wind direction. On windy days, such wind canyon effects can result in concentrated high winds channeled along the street as well as turbulent wind eddies at street corners where adjacent streets enter. The effect on pedestrians entering the main wind canyon from a side street with lower wind is commonly a sudden change in wind speed as well as high turbulence at the street corner.

Cathedral Hill Campus

The proposed 3.85-acre Cathedral Hill Campus, if approved and built, would occupy three sites in the Cathedral Hill area of San Francisco. The site proposed for the Cathedral Hill Hospital occupies an entire block bounded by Post Street to the north, Van Ness Avenue to the east, Geary Boulevard to the south, and Franklin Street to the west. The site of the proposed Cathedral Hill Medical Office Building (MOB) is located on the east side of Van Ness Avenue, on the block bounded by Cedar Street to the north, Polk Street to the east, Geary Street to the south, and Van Ness Avenue to the west. The site of the proposed 1375 Sutter MOB conversion is located at the southeast corner of the intersection of Sutter and Franklin Streets and is bordered by Sutter Street to the north, Daniel Burnham Court to the south, and Franklin Street to the west. Ten buildings currently occupy the location of the proposed Cathedral Hill Campus:

- two buildings at the site of the proposed Cathedral Hill Hospital—the 120-foot-tall (including 16-foot mechanical penthouse), 10-story Cathedral Hill Hotel and the adjacent approximately 180-foot-tall (including 25-foot mechanical penthouse), 11-story 1255 Post Street Office Building;

- seven two- to three-story commercial and residential use buildings up to 40 feet tall at the site of the proposed Cathedral Hill MOB, on the east side of Van Ness Avenue; and

- one 80-foot-tall (including 15-foot mechanical penthouse), five-story office and retail-use building at the site of the proposed 1375 Sutter MOB.

The Cathedral Hill Campus site has moderate wind conditions. It is sheltered from prevailing winds by existing buildings to the north and elevated terrain to the west. The prevailing winds from the west to northwest tend to align along the approximate east-west–running Geary and Post Streets, whereas Franklin Street and Van Ness Avenue are located in the lee (downwind and sheltered side) eastern side of buildings that intercept the west winds. The existing Cathedral Hill Hotel site is partially sheltered from northwest winds by existing buildings up to seven stories tall to the immediate northwest. The west side of the hotel is the windward side (that is, the side that faces the wind). The site of the proposed Cathedral Hill MOB, across Van Ness Avenue, is sheltered from northwest and west winds by the 10-story Cathedral Hill Hotel building, the 11-story 1255 Post Street Office Building, and the 16-story One Daniel Burnham Court to the northwest. The building at 1375 Sutter Street is partially sheltered from northwest and west winds from existing buildings up to six stories tall to the northwest and low-rise buildings to the west. All three sites are additionally sheltered from west winds by the terrain, which slopes upward to the west in the immediate vicinity of the proposed campus. The topography places the Cathedral Hill Campus site on the lee side of the topography, which has the general effect of reducing wind at street level.

The site of the proposed Cathedral Hill Campus is located within the Van Ness Special Use District (SUD), which is subject to specified wind speed criteria, as discussed later in Section 4.9.2, “Regulatory Framework” (see page 4.9-15 for a detailed explanation of the criteria). Under these criteria, no wind hazard criteria (26 mph) are exceeded at present, but wind modeling indicates that 16 of the 45 measured test point locations around the campus site and in the vicinity are currently in exceedance of the pedestrian-comfort value of more than 11 mph equivalent wind speed for 10% of the time, as established by Section 148 of the San Francisco Planning Code (Planning Code). These exceedances are generally located along Geary Boulevard, at the intersection of Geary Street and Van Ness Avenue, and near the Post Street/Van Ness Avenue intersection.

Pacific Campus

The 4.6-acre Pacific Campus occupies several blocks in the Pacific Heights neighborhood of San Francisco. The campus is generally bounded by Clay Street to the north, Buchanan Street to the east, Sacramento Street to the south, and Webster Street to the west. The northeast corner of the campus is currently a surface parking lot. The Pacific Campus consists of 15 buildings:

- the 120-foot-tall plus 18-foot mechanical penthouse, nine-story 2333 Buchanan Street Hospital building;
- the 99-foot-tall plus 16-foot mechanical penthouse, seven-story 2351 Clay Street building (Stanford Building);
- the 39-foot-tall plus 12-foot mechanical penthouse, three-story 2330 Clay Street building (Stern Building);
- the 76-foot-tall plus 16-foot mechanical penthouse, seven-story 2340–2360 Clay Street building (Annex MOB);
- the 60-foot-tall plus 11-foot mechanical penthouse, five-story 2200 Webster Street building (Gerbode Research Building);
- the 39-foot-tall, three-story 2400 Clay Street building (Clay Street MOB);
- the 30-foot-tall, four-story Clay Street/Webster Street Parking Garage at 2405 Clay Street;
- three- to five-story (up to approximately 50-foot-tall) residential/commercial buildings;
- the 40-foot-tall, three-story Health Sciences Library;
- the 80-foot-tall plus 16-foot mechanical penthouse, five-story 2100 Webster MOB (Pacific Professional Building); and
- three- and four-story residential buildings (up to approximately 50-foot-tall) south of Sacramento Street between Webster and Buchanan Streets.

Because the terrain near the Pacific Campus slopes upward to the east, the site is exposed to prevailing winds from the west to northwest. As a result, winds tend to be channeled along approximate east-west–running Clay, Sacramento, and California Streets, while Buchanan and Webster Streets are located downwind of buildings that intercept the prevailing west winds and shelter the street level. The 138-foot-tall (including mechanical penthouse) 2333 Buchanan Street Hospital building is the largest and tallest structure in the neighborhood and is located on the highest portion of the campus site. The hospital building is oriented on an approximate north-south axis, and therefore it has the strongest effect on wind conditions; that is, the hospital’s broad and high western façade is approximately perpendicular to the westerly wind. The Buchanan Street side of the hospital (which is the main entrance) is located on the leeward side of the structure where west winds are intercepted and reduced by the building. The breezeway at the Buchanan Street main entrance is located along the Clay Street alignment, and thus provides a passageway to Buchanan Street for west winds. On the west side of the 2333 Buchanan Street

Hospital building, the hospital's lower floors are sheltered from northwest and west winds by the adjacent five-story medical office building.

The mid-rise buildings on the north side of Clay Street east of Webster Street are partially sheltered from northwest and west winds by two- to three-story residences on Webster Street and two- to six-story residences on Washington Street. The Pacific Professional Building (2100 Webster Street) is sheltered from west winds by the mid-rise University of the Pacific building and the Clay Street/Webster Street Parking Garage. Campus buildings on the south side of Sacramento Street are sheltered from northwest and west winds by the Pacific Professional Building, mid-rise University of the Pacific building, and other structures. In general, although windy conditions are present at times, the mid-rise and low-rise building heights and spatial arrangement of the existing buildings on the campus site and in the vicinity do not result in highly concentrated wind conditions at street level, such as wind canyons. Street trees are mostly broadleaf evergreens that further reduce wind conditions at street level.

California Campus

The 4.9-acre California Campus occupies one entire block and portions of two other blocks in the Presidio Heights neighborhood of San Francisco. The campus is bounded by Sacramento Street to the north, Maple Street to the east, California Street to the south, and Cherry Street to the west. The California Campus consists of nine buildings, including the 91-foot-tall, six-story 3700 California Street Hospital building; the 99-foot-tall, seven-story 3801 Sacramento Street Outpatient/Research Building; and the 60-foot-tall, six-story former Marshall Hale Hospital building. Campus building heights range from three to nine stories. The tallest building on the campus is the nine-story, 103-foot-tall 3838 California Street MOB, located in the southwestern portion of the campus.

Because the campus is located in the western part of the city, it is subject to fairly strong winds coming from the Pacific Ocean. Large hills to the west are absent, and thus little or no protection from a lee effect is present. The campus is partially sheltered from northwest and west winds by two- to four-story residences on Sacramento Street. However, the terrain near the California Campus slopes upward to the east, which exposes the site to prevailing west and northwest winds. In general, although windy conditions are present at times, the mid-rise and low-rise building heights and spatial arrangement of the existing buildings on the campus site and in the vicinity do not result in concentrated wind conditions at street level.

Davies Campus

The 7.2-acre Davies Campus, in the Duboce Triangle neighborhood, is located on one lot that occupies an entire city block. The campus is bounded by Duboce Avenue to the north, Noe Street to the east, 14th Street to the south, and Castro Street to the west. The site is currently occupied by four buildings:

- the 66-foot-tall plus 18-foot mechanical penthouse, five-story Davies Hospital North Tower;

- the 66-foot-tall plus 18-foot mechanical penthouse, four-story Davies Hospital South Tower;
- the 67-foot-tall plus 10-foot mechanical penthouse, four-story 45 Castro Street MOB; and
- the 30-foot-tall, three-story Castro Street/14th Street Parking Garage.

Campus building heights range from three to five stories. The tallest building on the campus is the Davies Hospital, which consists of the 66-foot-tall North Tower and South Tower. The 45 Castro Street MOB at the northwest corner of the campus is 67 feet tall. The three-story Castro Street/14th Street Parking Garage occupies the southwest corner of the campus.

The site is located on the leeward side of the hills forming Buena Vista Park and Corona Heights to the west. This position results in reduced wind conditions, particularly from west and northwest winds. The terrain in the immediate vicinity of the Davies Campus rises steeply to the west toward Buena Vista Park, which increases the sheltering effect of existing upwind structures. Some of the high-lying land to the west is open space, but most is urban two- to three-story residential development, and the houses further intercept west and northwest winds. Additionally, the site of the proposed Neuroscience Institute building is sheltered from northwesterly and westerly winds by the existing Davies Hospital North Tower and 45 Castro Street MOB. The site of the proposed Castro Street/14th Street MOB is sheltered from prevailing winds by existing three- and four-story residences on Castro Street. In general, although windy conditions are present at times, the mid-rise and low-rise building heights of the existing buildings on the campus site and in the vicinity do not result in concentrated wind conditions at street level.

St. Luke’s Campus

The 4.4-acre St. Luke’s Campus is located on the block generally bounded by Cesar Chavez Street to the north, Valencia Street to the east, Duncan Street to the south, and San Jose Avenue to the west. On the eastern portion of the block, the St. Luke’s Campus is bounded by Cesar Chavez Street to the north, San Jose Avenue to the east, 27th Street to the south, and Guerrero Street to the west. The site is currently occupied by eight structures located east of San Jose Avenue:

- the 158-foot-tall plus 11-foot mechanical penthouse, 12-story St. Luke’s Hospital tower;
- the 53-foot-tall plus 14-foot mechanical penthouse, four-story 1957 Building;
- the 53-foot-tall, four-story 1912 Building;
- the 102-foot-tall plus 11-foot mechanical penthouse, eight-story Monteagle Medical Center building;

- the 34-foot-tall, two-story Hartzell Building;
- the 28-foot-tall plus 10-foot stairwells, two-story Duncan Street Parking Garage;
- the 12-foot-tall, one-story MRI trailer; and
- the 12-foot-tall, one-story Redwood Administration Building.

Additionally, the campus contains a surface parking lot located on the portion of the campus that is west of San Jose Avenue.

The St. Luke's Campus is located in the eastern part of the city on the leeward side of the high hills forming Diamond Heights and Twin Peaks to the west. The terrain in the immediate vicinity of the St. Luke's Campus rises to the north and west of the site, with residential development on Guerrero and Dolores Streets located upslope, which increases the sheltering effect from existing upwind structures.

The sites of the proposed St. Luke's Replacement Hospital and MOB/Expansion Building are sheltered from northwest and west winds by two- and three-story residences and a low-rise office building on Cesar Chavez Street, and by residences, all off campus, on Guerrero Street. In general, although windy conditions are present at times, the mid-rise and low-rise building heights of the existing buildings on the campus and vicinity do not result in concentrated wind conditions at street level. Street trees also reduce wind effects.

SHADOW

Shadow effects can alter temperature, solar radiation, moisture, and to a lesser extent, wind in the areas where they fall. Maintaining direct sunlight is essential to creating usable, enjoyable open space within San Francisco. The *San Francisco General Plan* considers existing open spaces a "major city resource" and the creation and maintenance of adequate open space is considered of "vital importance."[3] Section 295 of the Planning Code, the Sunlight Ordinance, was adopted in November 1984, pursuant to voter approval of Proposition K, to regulate new shadows cast on open spaces. Section 295 generally prohibits the issuance of building permits for structures greater than 40 feet that would cast new shadows on open spaces under the jurisdiction of (or designated for acquisition by) the San Francisco Recreation and Park Commission, and that would have a significant adverse impact on the use of such spaces from 1 hour after sunrise until 1 hour before sunset. The San Francisco Planning Commission, in consultation with the general manager of the San Francisco Recreation & Park Department (SFRPD), has the authority to determine that new shadows cast by a proposed development would not have a significant adverse impact on the use of an open space. Proposition K analyses were conducted for the Cathedral Hill and St. Luke's Campuses where applicable and are discussed below under Impact WS-2 (page 4.9-33).

[3] San Francisco Planning Department. 1996. *San Francisco General Plan*, Recreation and Open Space Element. San Francisco, CA.

Although not covered under Section 295, additional open space analyzed in this section includes publicly owned or controlled open space areas and privately owned, publicly accessible open space areas.

Cathedral Hill Campus

As shown in Figure 4.10-2, "Parks and Open Spaces within One-Half Mile of the Proposed Cathedral Hill Campus," on page 4.10-5 in Section 4.10, "Recreation," the following 15 open spaces within 0.5 mile of the proposed Cathedral Hill Campus are under the jurisdiction of the SFRPD:[4]

- Sergeant John Macaulay Park, located at Larkin Street and O'Farrell Street (0.20 mile east of the proposed campus);
- Jefferson Square, located at Gough Street and Eddy Street (0.26 mile southwest);
- Hyde-Turk Mini Park, located at Hyde Street and Turk Street (0.36 mile southeast);
- Tenderloin Park and Recreation Center, located at 570 Ellis Street (0.36 mile east);
- Margaret S. Hayward Playground (including the James Lang Field), located at 1016 Laguna Street (0.39 mile southwest);
- Japantown Peace Plaza and Pagoda, located at Post Street and Buchanan Street (0.40 mile west);
- Joseph L. Alioto Performing Arts Piazza (Civic Center Plaza), located at Larkin Street and Grove Street (0.43 mile southeast);
- City Hall, located at 1 Dr. Carlton B. Goodlett Place (0.47 mile south);
- War Memorial Opera House, located at 301 Van Ness Avenue (0.47 mile south);
- Lafayette Park, located at Washington Street and Laguna Street (0.48 mile northwest);
- Cottage Row Mini Park, located at Sutter Street and Fillmore Street (0.50 mile west);
- San Francisco Main Library, located at 100 Larkin Street (0.50 mile southeast);
- Buchanan Street Mall, located at Buchanan Street and Grove Street (0.50 mile southwest); and
- Father Alfred E. Boeddeker Park, located at 240 Eddy Street (0.50 mile east).

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[4] San Francisco Recreation & Park Department. 2009. Facility Listings. Available: www.parks.sfgov.org/site/recpark_index.asp?id=1503. Accessed September 24, 2009.

In addition to the properties listed above, the following seven open spaces that are not subject to Section 295 of the Planning Code are located near the proposed Cathedral Hill Campus:[5]

- Daniel Burnham Court (private open space owned by One Daniel Burnham Court), located at Post Street and Van Ness Avenue (0.02 mile north of the proposed campus);
- Redding School Yard (private open space owned by the San Francisco Unified School District [SFUSD]), located at 1421 Pine Street (0.36 mile northeast);
- non-SFRPD Buchanan Street Mall (public open space associated with a shopping center), located on Buchanan Street between Post Street and Sutter Street (0.37 mile west);
- Rosa Parks Elementary School Yard (private open space owned by SFUSD), located at 1501 O'Farrell Street (0.39 mile west);
- Rosa Parks Senior Center (including a small playground), located at 1111 Buchanan Street (0.45 mile southwest);
- unnamed public open space located at Geary Boulevard and Webster Street (0.50 mile west); and
- Spring Valley School Yard (private open space owned by SFUSD), located at 1451 Jackson Street (0.50 mile northeast).

Pacific Campus

As shown in Figure 4.10-3, "Parks and Open Spaces within One-Half Mile of the Pacific Campus," on page 4.10-10 in Section 4.10, "Recreation," the following eight open spaces within 0.5 mile of the Pacific Campus are under the jurisdiction of SFRPD:[6]

- Lafayette Park, located at Washington Street and Laguna Street (0.17 mile east of the campus);
- Cottage Row Mini Park, located at Sutter Street and Fillmore Street (0.18 mile south);
- Alta Plaza, located at Jackson Street and Steiner Street (0.25 mile northwest);
- Japantown Peace Plaza and Pagoda, located at Post Street and Buchanan Street (0.36 mile southeast);

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[5] San Francisco Recreation & Park Department. 2009. Overview. Available: http://www.ci.sf.ca.us/site/uploadedfiles/recpark/overview.htm. Accessed September 24, 2009.

[6] San Francisco Recreation & Park Department. 2009. Facility Listings. Available: www.parks.sfgov.org/site/recpark_index.asp?id=1503. Accessed September 24, 2009.

- Hamilton Playground, Pool, and Recreation Center, located at Geary Boulevard and Steiner Street (0.44 mile southwest);
- Western Addition Branch Library, located at 1550 Scott Street (0.49 mile southwest);
- Allyne Park, located at Gough Street and Green Street (0.50 mile northeast); and
- Raymond Kimbell Playground, located at O'Farrell Street and Steiner Street (0.50 mile southwest).

In addition to the properties listed above, the following three open spaces that are not subject to Section 295 of the Planning Code are located near the Pacific Campus:[7]

- non-SFRPD Buchanan Street Mall (public open space associated with a shopping center), located on Buchanan Street between Post Street and Sutter Street (0.30 mile south); and
- Japantown (public open space), located at Geary Boulevard and Webster Street (0.35 mile south); and
- Rosa Parks Elementary School Yard (private open space owned by SFUSD), located at 1501 O'Farrell Street (0.49 mile south).

California Campus

As shown in Figure 4.10-4, "Parks and Open Spaces within One-Half Mile of the California Campus," on page 4.10-14 in Section 4.10, "Recreation," the following five open spaces within 0.5 mile of the California Campus are under the jurisdiction of SFRPD:[8]

- Julius Kahn Playground, located at Pacific Avenue and Spruce Street (0.31 mile northeast of the campus);
- Laurel Hill Playground, located at Euclid Avenue and Collins Street (0.36 mile southeast);
- Presidio Heights Playground, located at Clay Street and Walnut Street (0.44 mile northeast);
- Mountain Lake Park, located at 12th Avenue and Lake Street (0.50 mile west); and
- Angelo J. Rossi Park, located at Anza Street and Arguello Boulevard (0.50 mile south).

In addition to the properties listed above, the following four open spaces that are not subject to Section 295 of the Planning Code are located near the California Campus:[9]

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[7] San Francisco Recreation & Park Department. 2009. Overview. Available: http://www.ci.sf.ca.us/site/uploadedfiles/recpark/overview.htm. Accessed September 24, 2009.

[8] Ibid.

- the Presidio (public open space owned by the National Park Service), located north of Pacific Avenue between Lyon Street and the ocean (0.23 mile north of the campus);
- Roosevelt Middle/High School Gym (private open space owned by SFUSD), located at 460 Arguello Boulevard (0.32 mile southwest);
- University of San Francisco (private open space owned by the university), located at 330 Parker Avenue (0.47 mile southeast); and
- George Peabody School Yard (private open space owned by SFUSD), located at 251 6th Avenue (0.48 mile southwest).

Davies Campus

As shown in Figure 4.10-5, “Parks and Open Spaces within One-Half Mile of the Davies Campus,” on page 4.10-18 in Section 4.10, “Recreation,” the following 13 open spaces within 0.5 mile of the Davies Campus are under the jurisdiction of SFRPD:[10]

- Duboce Park, located at Duboce Avenue and Scott Street (0.03 mile north of the campus);
- Roosevelt and Henry Stairs, connecting Roosevelt Way and Henry Street south of Alpine Terrace (0.13 mile southwest);
- Beaver and Noe Mini Park, located at Noe Street and Beaver Street (0.24 mile southeast);
- Eureka Valley–Harvey Milk Branch Library, located at 3555 16th Street (0.25 mile southeast);
- Buena Vista Park, located at Haight Street and Buena Vista Avenue (0.25 mile west);
- Corona Heights Park (including Peixotto Playground and State Street Playground), located at Roosevelt Way and Museum Way (0.31 mile southwest);
- Dolores Parkway, median along Dolores Street between Market Street and San Jose Avenue (0.37 mile east at the closest point);
- Saturn Street Steps, connecting Saturn Street and Ord Street between 17th Street and Ord Court (0.44 mile southwest);

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9 Ibid.
10 San Francisco Recreation & Park Department. 2009. Facility Listings. Available: www.parks.sfgov.org/site/recpark_index.asp?id=1503. Accessed September 24, 2009.

- Page Community Garden, located on Page Street between Webster Street and Buchanan Street (0.45 mile northeast);
- Eureka Valley Playground and Recreation Center (Collingwood Park), located at 100 Collingwood Street (0.49 mile southwest);
- Panhandle Park, located at Oak Street and Baker Street (0.50 mile northwest);
- Koshland Park, located at Buchanan Street and Page Street (0.50 mile northeast); and
- Alamo Square, located at Steiner Street and Hayes Street (0.50 mile north).

In addition to the properties listed above, the following seven open spaces that are not subject to Section 295 of the Planning Code are located near the Davies Campus:[11]

- Noe Street Park (public roadway streetscape owned by the San Francisco Department of Public Works [DPW]), located on Noe Street between Duboce Avenue and 16th Street (adjacent to the campus to the east at the park's closest point);
- Sanchez Street Park (public roadway streetscape owned by DPW), located on Sanchez Street between Duboce Avenue and 15th Street (0.14 mile east at the closest point);
- Waller Street Park (public open space owned by DPW), located on Waller Street between Broderick Street and Buena Vista Street East (0.20 mile west);
- Castro Commons (public open space owned by Pavement to Parks), located at Castro Street and 17th Street (0.34 mile south);
- Dolores Street Community Garden (private open space owned by Dolores Street Community Services) (0.37 mile southeast);
- Divisadero Street Parklet (public open space owned by Pavement to Parks), located on Divisadero Street between Hayes Street and Grove Street (0.46 mile northwest); and
- John Muir Schoolyard (private open space owned by SFUSD), located at 380 Webster Street (0.50 mile northeast).

[11] San Francisco Recreation & Park Department. 2009. Overview. Available: http://www.ci.sf.ca.us/site/uploadedfiles/recpark/overview.htm. Accessed September 24, 2009.

St. Luke's Campus

As shown in Figure 4.10-6, "Parks and Open Spaces within One-Half Mile of the St. Luke's Campus," on page 4.10-23 in Section 4.10, "Recreation," the following 10 open spaces within 0.5 mile of the St. Luke's Campus are under the jurisdiction of SFRPD:[12]

- Coso and Precita Mini Park, located at Coso Avenue and Precita Avenue (0.16 mile east of the campus);
- Dolores Parkway, median along Dolores Street between Market Street and San Jose Avenue (0.20 mile west at the closest point);
- Coleridge Mini Park, located at Coleridge Street and Peters Avenue (0.21 mile southeast);
- Juri Commons Mini Park, located at San Jose Avenue and 25th Street (0.23 mile north);
- Bernal Heights Park, located at Bernal Heights Boulevard (0.36 mile southeast);
- Precita Park, located at Folsom Street and Precita Avenue (0.42 mile east);
- Good Prospect Community Garden, located at Prospect Avenue at Cortland Avenue (0.46 mile south);
- Upper Noe Recreation Center, located at Sanchez Street and Day Street (0.47 mile southwest);
- Bernal Heights Community Garden, located on Bernal Height Boulevard east of Ellsworth Street (0.50 mile southeast); and
- Garfield Square, located at Harrison Street and 26th Street (0.50 mile northeast).

In addition to the properties listed above, the following six open spaces that are not subject to Section 295 of the Planning Code are located in the vicinity of the St. Luke's Campus:[13]

- Guerrero Park (public open space owned by Pavement to Parks), located on San Jose Avenue at Guerrero Street and 28th Street (0.13 mile southwest);
- Esmeralda Corridor (public open space owned by DPW), located on Esmeralda Avenue between Coleridge Street and Winfield Street (0.20 mile southeast);

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[12] San Francisco Recreation & Park Department. 2009. Facility Listings. Available: www.parks.sfgov.org/site/recpark_index.asp?id=1503. Accessed September 24, 2009.

[13] San Francisco Recreation & Park Department. 2009. Overview. Available: http://www.ci.sf.ca.us/site/uploadedfiles/recpark/overview.htm. Accessed September 24, 2009.

- Horace Mann School Yard (private open space owned by SFUSD), located at 1241 Valencia Avenue (0.40 mile north of the campus);
- Kingston Street and Coleridge Street Park (public open space owned by DPW), located on Coleridge Street at Kingston Street (0.42 mile south);
- Bernal Heights Open Space (public open space), located at Ripley Street and Folsom Street (0.44 mile southeast); and
- Horace Mann Gym (private open space owned by SFUSD), located at 3351 23rd Street (0.46 mile north).

4.9.2 REGULATORY FRAMEWORK

CITY/LOCAL

Wind

The Planning Code establishes wind comfort and wind hazard criteria used to evaluate new development in four areas of the city: the C-3 Downtown Commercial Districts (Section 148), the Van Ness Avenue SUD (Section 243[c][9]), the Folsom-Main Residential/Commercial SUD (Section 249.1), and the Downtown Residential District (Section 825). Section 148 of the Planning Code sets comfort levels of 7 mph equivalent wind speed for public seating areas and 11 mph equivalent wind speed for areas of substantial pedestrian use, each not to be exceeded more than 10% of the time from 7 a.m. to 6 p.m. In addition to the comfort criteria, the Planning Code establishes a wind hazard criterion. The Planning Code also provides that any new building or addition in these areas of the city that would cause wind speeds to exceed the hazard level of 26-mph-equivalent wind speed (as defined in the Planning Code) for more than 1 hour of any year must be modified to meet this criterion. (The 26-mph standard accounts for short-term—3-minute averaged—wind observations at 36 mph as equivalent to the frequency of an hourly averaged wind of 26 mph. As noted above, winds greater than 34 mph make it difficult for a person to maintain balance, and gusts can blow a person over.)

Only the site of the proposed Cathedral Hill Campus is located within one of these four designated areas (the Van Ness Avenue Area SUD) and is subject to the wind criteria under Section 243(c)(9) of the SUD. The criteria do not apply to the existing Pacific, Davies, California, and St. Luke’s Campuses. However, for a conservative approach, the San Francisco Planning Department generally refers to the wind hazard criterion to determine the significance for CEQA purposes evaluate wind effects of new development in all areas of San Francisco.

Shadow

San Francisco General Plan

The *San Francisco General Plan* includes policies that promote solar access and avoid shade to maintain the usability of public open space, in compliance with the requirements of Planning Code Section 295. The policies further protect open spaces that are under the jurisdiction of other public agencies or are privately owned, and thus not protected by the Planning Code amendments requiring that they not be shaded during the hours of their most intensive use. Consistency of the *San Francisco General Plan* is addressed in Chapter 3, "Plans and Policies."

San Francisco Planning Code

Planning Code Section 295, the Sunlight Ordinance, was adopted in 1984 following voter approval of Proposition K. The ordinance prohibits the issuance of building permits for structures greater than 40 feet tall that would cast shade or shadows on property under the jurisdiction of, or designated to be acquired by, the San Francisco Recreation and Park Commission between 1 hour after sunrise and 1 hour before sunset at any time of year, unless the San Francisco Planning Commission determines that the shade or shadow would have an insignificant adverse impact on the use of such property. Planning Code Section 295 states the following:

> The City Planning Commission shall conduct a hearing and shall disapprove the issuance of any building permit governed by the provisions of this Section if it finds that the proposed project will have any adverse impact on the use of the property under the jurisdiction of, or designated for acquisition by, the Recreation and Park Commission because of the shading or shadowing that it will cause, unless it is determined that the impact would be insignificant. The City Planning Commission shall not make the determination required by the provisions of this Subsection until the general manager of the Recreation and Park Department in consultation with the Recreation and Park Commission has had an opportunity to review and comment to the City Planning Commission upon the proposed project.

As required by Section 295, the Recreation and Park Commission and the Planning Commission adopted criteria in 1987 and 1989 for the review of shade, sunlight access, and shadow effects.[14] According to those adopted criteria, shadow is measured by multiplying the area of the shadow by the amount of time the shadow is present on the park in units called "square foot–hours." Determining the shadow impact caused by a project begins by calculating the number of square foot–hours the project would cast shadows on a protected property during each day from 1 hour after sunrise to 1 hour before sunset, summed over the course of a year. The calculation ignores

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[14] San Francisco Planning Department. 2003. Planning Code Section 295, Presentation for Planning Commission Hearing on October 23, 2003. San Francisco, CA. This report is an overview of current procedures for Planning Department review of applications that are subject to Section 295, and includes a review of the Planning Code requirements and of the implementation document adopted jointly by the Recreation and Park and Planning Commissions, and a description of the technical methodology for analysis of shadow impacts on protected properties.

shadow from any surrounding structures and from clouds, fog, and solar eclipses. This is called the “Annual Available Sunlight” for that park. The shadow impact of the project is defined as the shadow in square foot–hours cast by the project divided by the Annual Available Sunlight, expressed as a percentage. Further, in addition to quantitative criteria, qualitative criteria for evaluation of shadow have been adopted. Those criteria for assessing new shadow would be based on existing shadow profiles, important times of day, important seasons in the year, location of the new shadow, size and duration of new shadows, and the public good served by buildings casting new shadow.

Also, the adopted criteria state that small parks, less than 2 acres in area, with existing shadow loads of 20% or larger should not be subjected to additional shadow by new development. Larger parks (2 acres or more) with shadow loads between 20% and 40% would have an additional new-shadow budget of 0.1%. Larger parks with existing shadow loads of less than 20% would have an additional new shadow budget of 1.0%. The adopted criteria also include absolute cumulative limits for increase in percent shading for 14 parks[15] in the general downtown area. Parks and open spaces near the existing and proposed CPMC campuses that are under the jurisdiction of SFRPD are listed above in the existing setting for shadows.

4.9.3 CUMULATIVE CONDITIONS

WIND

The geographic context for an analysis of cumulative impacts with regard to wind effects is limited to the proposed development site and the immediate vicinity around each campus. As described above in Section 4.9.1, “Environmental Setting” (page 4.9-1), wind accelerations are directly related to the exposure, massing, and orientation of surrounding development. Existing development surrounding each campus represents the baseline conditions for evaluating cumulative wind impacts of the proposed project. Cumulative impacts are evaluated by considering the proposed development at each campus in conjunction with other reasonably foreseeable cumulative development near that campus. These reasonably foreseeable development projects are detailed in Section 4.1.3, “Cumulative Conditions” (page 4.1-29 of Section 4.1, “Land Use and Planning”).

SHADOW

The geographic context for an analysis of cumulative new shadow impacts on outdoor recreation facilities or other public space is limited to the immediate development site and vicinity around each campus. Existing development surrounding each campus represents the baseline conditions for evaluating cumulative shadow impacts, as described above in Section 4.9.1, “Environmental Setting” (page 4.9-1). Cumulative impacts are evaluated by considering the proposed development at each campus in conjunction with other reasonably foreseeable

[15] San Francisco Planning Commission. 1989 (February 7). San Francisco Planning Commission Resolution 11595: “Summary of Shadow Impacts and Absolute Cumulative Limits.” San Francisco, CA.

development near that campus. These reasonably foreseeable development projects are detailed in Section 4.1.3, “Cumulative Conditions” (page 4.1-29 of Section 4.1, “Land Use and Planning”).

4.9.4 SIGNIFICANCE CRITERIA

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been adopted and modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the project would result in a significant impact on wind and shadow conditions. Implementation of the proposed project would have a significant effect on wind and shadow conditions if it would:

- 9a—alter wind in a manner that substantially affects public areas.
- 9b—create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas; or
- 9c—create net new shadow that would affect, in an adverse manner, the use of any park or open space under the jurisdiction of SFRPD; significantly detract from the usability of other existing publicly accessible open space; alter temperature so as to substantially affect public areas; or change the climate in either the community or the region.

LRDP PROJECT FEATURES

Project features (described in greater detail in Chapter 2, “Project Description”) are summarized below.

Cathedral Hill Campus LRDP Features

Implementing the LRDP at the proposed Cathedral Hill Campus would involve demolishing the nine existing structures on the properties at the site of the proposed campus: the 10-story, 120-foot-tall (including 16-foot mechanical penthouse) Cathedral Hill Hotel, the adjacent 180-foot-tall (including 25-foot mechanical penthouse) 1255 Post Street Office Building, and several two- to three-story buildings (up to approximately 40-foot-tall) on the 1000 block of Geary Street. Proposed new construction includes a 15-story, 269-foot-tall Cathedral Hill Hospital (as measured from Van Ness Avenue at Post Street from the sidewalk to the top of the mechanical screen) and a nine-story, 169-foot-tall Cathedral Hill MOB (at maximum height as measured from Geary Street near Polk Street to the top of the mechanical penthouse). The proposed development would also involve constructing a pedestrian tunnel (connecting the Cathedral Hill Hospital and Cathedral Hill MOB) beneath Van Ness Avenue, converting the interior of the existing Pacific Plaza Office Building at 1375 Sutter Street to become the 1375 Sutter MOB, and implementing streetscape improvements.

Pacific Campus LRDP Features

Implementing the LRDP at the Pacific Campus would involve renovating the nine-story, 138-foot-tall (including mechanical penthouse) 2333 Buchanan Street Hospital into the proposed ACC, and subsequently constructing a nine-story, 138-foot-tall (including mechanical penthouse) ACC Addition directly west of the new ACC and directly east of the existing five-story, 96-foot-tall (including mechanical penthouse) Pacific Professional Building (2100 Webster Street). The proposed ACC Addition would be similar in height to the ACC but would have a smaller, west-facing façade. The proposed six-story (plus top deck), 70-foot-tall North-of-Clay Aboveground Parking Garage would be constructed north of the Pacific Professional Building and proposed ACC Addition, and may have a solid north façade and upwind (west) and downwind (east) façades with open windows. The development projects would also involve demolishing the 92-foot-tall (including mechanical penthouse) Annex MOB (2340–2360 Clay Street), 71-foot-tall (including mechanical penthouse) Gerbode Research Building (2200 Webster Street), and 115-foot-tall (including mechanical penthouse) Stanford Building (2351 Clay Street).

California Campus LRDP Features

No projects are proposed for the California Campus under the LRDP and all existing buildings would remain in their current physical condition. Therefore, no project features are discussed here.

Davies Campus LRDP Features

Implementing the near-term project at the Davies Campus under the LRDP would involve constructing the four-story, 61-foot-tall (at maximum height as measured to the top of the parapet from the centerline of the east façade from 14th Street) Neuroscience Institute building in a location currently occupied by surface parking. Long-term projects at the Davies Campus under the LRDP would involve demolishing the existing three-story 30-foot-tall Castro Street/14th Street Parking Garage and constructing the three-story, 45-foot-tall (including mechanical penthouse) Castro Street/14th Street MOB on the parking garage site.

St. Luke’s Campus LRDP Features

Implementing the LRDP at the St. Luke’s Campus would involve constructing the St. Luke’s Replacement Hospital west of the existing 12-story, 169-foot-tall (including mechanical penthouse) St. Luke’s Hospital tower. The proposed five-story St. Luke’s Replacement Hospital would be 99 feet tall (at maximum height as measured from Cesar Chavez Street). The existing hospital tower would be demolished and replaced by the proposed five-story, 100-foot-tall (at maximum height as measured from Cesar Chavez Street) MOB/Expansion Building. Because the site slopes downward to the east and north, both the proposed St. Luke’s Replacement Hospital and MOB/Expansion Building would vary in height relative to the location from which they were viewed.

4.9.5 IMPACT EVALUATIONS

The analysis of the wind and shadow impacts below focuses on the effects of facility operations.

METHODOLOGY

Wind

CEQA and the State CEQA Guidelines do not list any specific criterion for the evaluation of wind effects of a project. There is also no threshold massing or height criterion under CEQA that triggers the need for wind-tunnel testing to determine whether the building design would result in street-level winds that exceed the standard. It is generally acknowledged from various wind-tunnel tests on a variety of projects in San Francisco that most buildings less than approximately 80 feet tall do not result in substantial adverse wind effects at street level, barring unusual circumstances of the site and planning context. The 80-foot measure is not a firm standard and lower buildings may have the potential to affect wind in a given context. In general, however, structures shorter than the 80-foot-tall “soft threshold” do not present as much wind interception and deflection as the taller buildings, which also generally have greater mass. In most cases, wind tunnel studies are carried out for high-rise towers, particularly those proposed in areas with substantial existing or proposed high-rise buildings, such as the Downtown, South of Market and Rincon Hill areas, where wind hazard is substantial.

The site of the proposed Cathedral Hill Campus is located within the area covered by the Van Ness Avenue SUD, which is subject to the wind speed impact criteria discussed above in Section 4.9.2, “Regulatory Framework” (see page 4.9-15). An exceedance of the wind speed impact criteria would constitute a significant adverse impact at the proposed Cathedral Hill Campus. Consistent with Section 148 of the Planning Code, a significant impact of the project would occur if:

- the proposed development at Cathedral Hill would exceed 11-mph wind speed for areas of substantial pedestrian use (i.e., pedestrian comfort criteria), each not to be exceeded more than 10% of the time from 7 a.m. to 6 p.m. (the daytime pedestrian comfort criterion); or

- the Planning Code wind hazard level criterion of 26-mph-equivalent wind speed for more than 1 hour of any year would be exceeded.

Accordingly, a quantitative wind tunnel analysis was conducted for the Cathedral Hill Campus—specifically, for the proposed Cathedral Hill Hospital and Cathedral Hill MOB. Because no exterior physical changes are proposed at the 1375 Sutter Street building, this building was not modeled for wind effects.

The above Planning Code wind-speed impact criteria are applicable for the wind analysis of the proposed Cathedral Hill Campus; however, these criteria do not apply to the existing Pacific, California, Davies, and St.

Luke's Campuses, where pedestrian-level winds are less affected by the surrounding cityscape and high-rise buildings are absent. Therefore, a wind tunnel analysis was not conducted for those four existing campuses.

However, this EIR also qualitatively evaluates the general potential of development at the Pacific, Davies, and St. Luke's Campuses under the LRDP to create substantial adverse or hazardous wind conditions on those existing campuses. No qualitative evaluation is provided for the California Campus because no exterior physical changes to the on-campus buildings and streetscape are proposed at that campus under the LRDP. For purposes of this analysis, development at the Pacific, Davies, and St. Luke's Campuses would result in a potentially significant wind impact if the exposure, orientation, and massing of the proposed structures would be expected to substantially increase ground-level winds in pedestrian corridors, sidewalks, and crosswalks, or public open spaces within or near the campus.

Shadow

Shadow modeling analyses were conducted for the LRDP's proposed near-term projects at the Cathedral Hill and St. Luke's Campuses to determine potential shadow impacts on recreational facilities protected by Planning Code Section 295. The shadow modeling analysis for each campus included two parts:

- *Shadow fans* identify the maximum extent of all LRDP-related shadows from 1 hour after sunrise to 1 hour before sunset over an entire year (in accordance with the review requirements of Planning Code Section 295), to determine impacts of LRDP development at Cathedral Hill and St. Luke's on SFRPD facilities and other public or private open space.

- *Shadow simulations* depict shadow impacts at specific times of the day for the minimum, midpoint, and maximum elevations of the sun. In accordance with City requirements, the specific times are 10 a.m., 12 noon, and 3 p.m. during the first day of each of the four seasons:

  - the winter solstice (December 21), when the sun is at its lowest zenith (the high point of the sun in the sky above the horizon);

  - the summer solstice (June 21), when the sun is at its highest zenith; and

  - during the spring and fall equinoxes (March 21 and September 21, respectively), when the sun is at its midpoint zenith.

The results of these simulations are presented graphically in the analysis below.

For near-term LRDP projects at the Davies Campus, shadow simulations for representative times of the year were prepared for the shadow study and a memorandum was prepared in connection with CPMC's earlier environmental application for the previously proposed Noe Street MOB in 2006.[16] The previously proposed Noe Street MOB has been incorporated into the CPMC LRDP as the proposed near-term development—the Neuroscience Institute building. The shape, building envelope, size, and location of the proposed Neuroscience Institute building are the same as proposed under the previous Noe Street MOB application to the Planning Department. Accordingly, these shadow simulations are representative of the currently proposed Neuroscience Institute under the LRDP and have been incorporated into this EIR's analysis. No shadow modeling analyses were conducted for the long-term development project at the Davies Campus—the Castro Street/14th Street MOB. However, potential impacts were qualitatively evaluated to determine their potential to affect existing recreational facilities protected by Planning Code Section 295 as currently proposed, as well as on other public or private open space. Additional analysis will be required for the proposed Castro Street/14th Street MOB to determine whether additional impacts on recreational facilities might occur once design plans are finalized or new recreation facilities are created in the vicinity.

Because no near-term development projects are proposed for the Pacific Campus, no shadow modeling analyses were conducted for this campus. Long-term development projects at the Pacific Campus were qualitatively evaluated to determine their potential to affect existing recreational facilities protected by Planning Code Section 295 as currently proposed, as well as on other public or private open space. Long-term development projects associated with the LRDP will require additional analysis to determine additional impacts on recreational facilities that might occur once design plans are finalized or new recreation facilities are created.

As stated previously, no near-term or long-term development projects are proposed for the California Campus and no change to the existing buildings would occur. Accordingly, no shadow modeling or projections were prepared for this campus.

IMPACT WS-1 *The project would not alter wind in a manner that substantially affects public areas. (Significance Criterion 9a)*

Levels of Significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

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[16] California Pacific Medical Center. 2006 (March 20). *Shadow Study and Memorandum prepared for the Noe Street Medical Office Building.* San Francisco, CA. Prepared by Turnstone Consulting, San Francisco, CA. This study and memorandum are on file with the San Francisco Planning Department, 1650 Mission Street, San Francisco, and are available for public review, as part of the project Case File No. 2004.0603E.

Near-Term Projects

◆ Cathedral Hill Campus

Because the proposed Cathedral Hill Campus is located within the Van Ness Avenue SUD (see Section 4.9.2, "Regulatory Framework," page 4.9-15) and therefore subject to the wind criteria for that district (see preceding discussion under "Methodology"), a wind tunnel analysis study[17] for the proposed Cathedral Hill Campus was prepared. The study included a quantitative wind tunnel analysis to determine existing wind conditions and potential future wind conditions that would occur if the LRDP were implemented at the proposed Cathedral Hill Campus. The analysis measured existing wind speeds at 45 locations around the site of the proposed campus, then compared them to the hazard criterion (26 mph) to determine the number of locations that currently experience wind above this criterion and duration of each exceedance. Those locations were then modeled to determine the wind speeds and the locations and duration of exceedances that could occur under the proposed design and layout for the Cathedral Hill Campus. The 45 test point locations used to conduct the analysis and the existing wind speeds at those locations are presented in Figure 4.9-1, "Cathedral Hill Campus—Wind Tunnel Test Point Locations," (page 4.9-26) and Table 4.9-2, "Results of the Wind Tunnel Analysis for the Proposed Cathedral Hill Campus."

As shown in Table 4.9-2, the existing conditions near the proposed Cathedral Hill Campus are moderately windy. The average wind speed under existing conditions near the proposed Cathedral Hill Campus for the 45 test point locations is approximately 10.6 mph, with the highest wind speed in the vicinity (21 mph) occurring at location 37 at the southwest corner of Geary Street and Franklin Street. Although 29 of the 45 measured test point locations are currently under the criterion value (equivalent wind speed of 11 mph) for pedestrian comfort established by Planning Code Section 148, 11 mph, 16 of the 45 test points exceed the pedestrian-comfort value more than 10% of the time from 7 a.m. to 6 p.m. under existing conditions. These exceedances are generally located along Geary Street and near the Post Street/Van Ness Avenue intersection (see Figure 4.9-1).

As under existing conditions, the proposed Cathedral Hill Campus buildings would be sheltered from prevailing winds by existing buildings and elevated terrain to the west. The site of the proposed hospital would be sheltered from northwest winds by existing buildings up to seven stories tall to the northwest. The site of the proposed Cathedral Hill MOB would be sheltered from northwest and west winds by the proposed Cathedral Hill Hospital and the existing 16-story-tall One Daniel Burnham Court to the west.

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[17] Ballanti, D. 2009 (September). *Wind Tunnel Analysis for the Proposed California Pacific Medical Center Cathedral Hill Campus Project.* El Cerrito, CA. Prepared for AECOM, San Francisco, CA. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, as part of Case No. 2005.0555E.

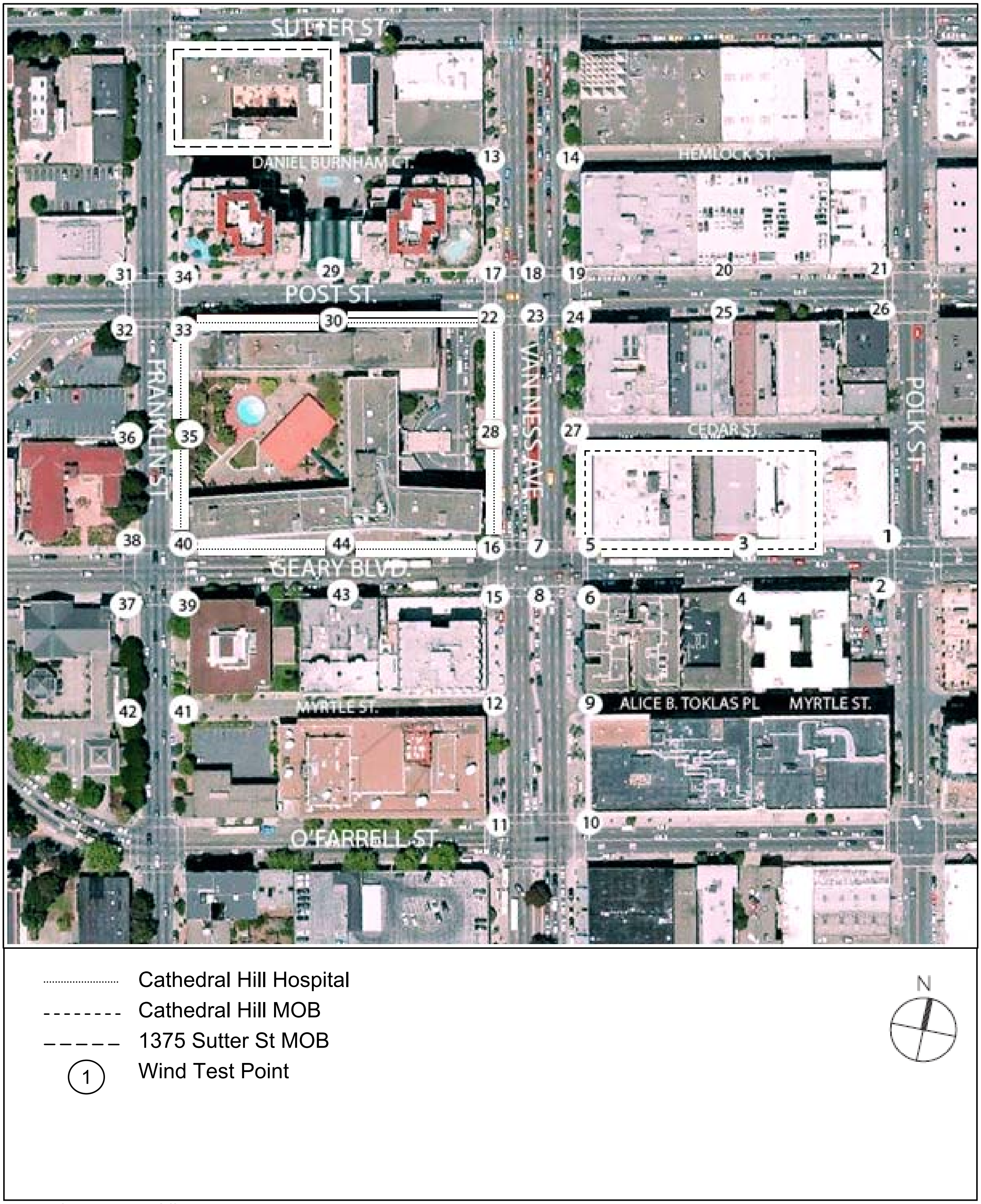
Table 4.9-2
Results of the Wind Tunnel Analysis for the Proposed Cathedral Hill Campus

Wind Point Location	Pedestrian Comfort Criterion (mph)	Existing*				Proposed*			
		Wind Velocity[a] (mph)	Measured Equivalent Wind Speed[b] (mph)	Hours per Year Above Hazard Criterion	% Time Above Pedestrian Comfort Criterion	Wind Velocity (mph)	Measured Equivalent Wind Speed (mph)	Hours per Year Above Hazard Criterion	% Time Above Pedestrian Comfort Criterion
1	11	10	19	0	–	9	17	0	–
2	11	11	19	0	–	9	16	0	–
3	11	**13**	24	0	**15**	11	22	0	–
4	11	**12**	22	0	**13**	10	17	0	–
5	11	**13**	25	0	**16**	**14**	28	0	**21**
6	11	11	19	0	–	10	27	0	–
7	11	**14**	27	0	**20**	**13**	23	0	**16**
8	11	**12**	21	0	**14**	11	19	0	–
9	11	9	16	0	–	9	22	0	–
10	11	**12**	21	0	**12**	**12**	22	0	**14**
11	11	11	21	0	–	11	21	0	–
12	11	8	17	0	–	9	15	0	–
13	11	9	20	0	–	9	19	0	–
14	11	11	24	0	–	11	24	0	–
15	11	**13**	23	0	**18**	**14**	25	0	**22**
16	11	**14**	25	0	**20**	**13**	25	0	**15**
17	11	6	21	0	–	7	12	0	–
18	11	8	21	0	–	9	22	0	–
19	11	9	25	0	–	9	24	0	–
20	11	7	12	0	–	5	9	0	–
21	11	6	21	0	–	7	19	0	–
22	11	**12**	22	0	**13**	9	23	0	–
23	11	9	20	0	–	8	19	0	–
24	11	8	19	0	–	7	17	0	–
25	11	7	11	0	–	6	11	0	–
26	11	8	20	0	–	8	18	0	–
27	11	7	14	0	–	8	18	0	–
28	11	8	14	0	–	8	16	0	–
29	11	10	18	0	–	**12**	21	0	**12**
30	11	**13**	22	0	**18**	**13**	21	0	**17**
31	11	10	18	0	–	10	18	0	–

Table 4.9-2
Results of the Wind Tunnel Analysis for the Proposed Cathedral Hill Campus

Wind Point Location	Pedestrian Comfort Criterion (mph)	Existing*				Proposed*			
		Wind Velocity[a] (mph)	Measured Equivalent Wind Speed[b] (mph)	Hours per Year Above Hazard Criterion	% Time Above Pedestrian Comfort Criterion	Wind Velocity (mph)	Measured Equivalent Wind Speed (mph)	Hours per Year Above Hazard Criterion	% Time Above Pedestrian Comfort Criterion
32	11	9	19	0	–	11	11	0	–
33	11	9	16	0	–	9	9	0	–
34	11	9	22	0	–	9	9	0	–
35	11	10	18	0	–	**12**	12	0	**12**
36	11	10	17	0	–	**13**	13	0	**17**
37	11	**21**	36	1	**43**	**18**	18	0	**37**
38	11	**12**	20	0	**13**	**13**	13	0	**15**
39	11	**17**	29	0	**31**	**13**	13	0	**19**
40	11	**14**	26	0	**23**	**14**	14	0	**20**
41	11	10	22	0	–	**12**	12	0	**17**
42	11	7	14	0	–	6	6	0	–
43	11	**17**	28	0	**29**	**18**	18	0	**37**
44	11	**13**	24	0	**17**	**18**	18	0	**33**
45	11	8	14	0	–	6	6	0	–
Average	–	10.6	–	**1**	–	10.5	–	**0**	–

Notes: mph = miles per hour
[a] Wind velocity refers to the speed at which the wind moves in a particular direction.
[b] The term "equivalent wind speed" (EWS) denotes the mean hourly wind speed adjusted to account for the expected turbulence intensity or gustiness at the site.
* Exceedances of the comfort criterion are shown in **bold**.
Source: Ballanti, D. 2009 (September). *Wind Tunnel Analysis for the Proposed California Pacific Medical Center Cathedral Hill Campus Project, San Francisco, California*. El Cerrito, CA. Prepared for AECOM, San Francisco, CA. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, as part of Case No. 2005.0555E.



Note: MOB = Medical Office Building.
Source: Google Earth, data compiled by AECOM in 2009

Cathedral Hill Campus—Wind Tunnel Test Point Locations **Figure 4.9-1**

As shown in Table 4.9-2, the wind tunnel analysis determined that if the proposed Cathedral Hill Hospital and Cathedral Hill MOB were built under the LRDP, winds in the Cathedral Hill Campus area would decrease slightly overall. The average wind speed for all test points would decrease to 10.5 mph, and wind speeds in sidewalk pedestrian areas would range from 5–18 mph, compared with a range of 6–21 mph under existing conditions.

Implementing the proposed LRDP would reduce wind speeds, or decrease the percentage of time above the daytime pedestrian-comfort criterion at 10 sites currently exceeding the pedestrian comfort criterion: locations 3, 4, 7, 8, 16, 22, 30, 37, 39, and 40. Existing exceedances of the pedestrian-comfort criterion (wind speed of 11 mph) at four of these locations would be eliminated with implementation of the LRDP: at locations 3 and 4 along Geary Boulevard, location 8 at the intersection of Geary Boulevard and Van Ness Avenue, and location 22 at the intersection of Van Ness Avenue and Post Street.

At the same time, implementing the proposed LRDP would increase wind velocity and/or its duration in excess of the pedestrian comfort criteria at 10 sites: locations 5, 10, 15, 29, 35, 36, 38, 41, 43, and 44. The proposed LRDP development would create new exceedances of the 11-mph pedestrian-comfort criterion at four of these locations:

- location 29 along Post Street (with wind velocity increasing from 10 mph to 12 mph and the percentage of time above the daytime pedestrian-comfort criterion increasing from 0% to 12%);

- location 35 along Franklin Street (wind velocity, increase from 10 to 12 mph; percentage of time above the daytime pedestrian-comfort criterion, increase from 0% to 12%);

- location 36 along Franklin Street (wind velocity, increase from 10 mph to 13 mph; percentage of time above the daytime pedestrian-comfort criterion, increase from 0% to 17%); and

- location 41 along Franklin Street (wind velocity, increase from 10 to 12 mph; percentage of time above the daytime pedestrian-comfort criterion, increase from 0 to 17%).

On the whole, these LRDP-related adverse changes at pedestrian-comfort-criteria exceedance sites are small changes in wind velocities. As noted in Section 4.9.1, “Environmental Setting” (page 4.9-1), winds of 8–13 mph would disturb hair, cause clothing to flap, and extend a light flag mounted on a pole. Also, although this site is not public open space, at test point 45, on the elevated terrace of the adjacent Daniel Burnham Court, wind speed would be reduced from 8 mph to 6 mph and would be within the Planning Code Section 148–stated comfort levels of 7 mph equivalent wind speed for public seating areas; that site also would continue to meet the pedestrian comfort criterion of 11 mph with the proposed LRDP development of the Cathedral Hill Campus. The Cathedral Hill wind tunnel report also determined that the wind speed near the proposed Cathedral Hill Campus, as under existing conditions, would remain below the wind-hazard criterion of 26 mph, with no hourly averaged exceedance.

Implementing the LRDP would result in a much larger, single structure at the proposed Cathedral Hill MOB site than those multiple structures currently located there. However, wind model data for the seven test points near the site of the proposed MOB at Geary Street and Van Ness Avenue (locations 1–6 and 27) do not reveal substantial changes. With development of the proposed Cathedral Hill MOB, wind would be reduced at five of those seven locations (1, 2, 3, 4, and 6) and increased slightly at two locations (5 and 27). At location 5 (northeast corner of Van Ness Avenue and Geary Street), the existing condition already exceeds the pedestrian-comfort criteria; the increase resulting from the proposed LRDP (i.e., the proposed Cathedral Hill Hospital and MOB) would be from 13 to 14 mph and the increase in the percentage of daytime above the pedestrian-comfort criterion would increase from 16% to 21%. (At location 27 [Van Ness Avenue/Cedar Street, the northwest corner of the proposed Cathedral Hill MOB], wind would increase but would remain below the pedestrian-comfort criteria for wind.)

Although implementing the proposed LRDP at the Cathedral Hill Campus site would create four new exceedances of the City's pedestrian-comfort criterion (11 mph) along Post Street and Franklin Street, it would also eliminate four existing exceedances of the City's pedestrian-comfort criterion along Geary Boulevard and Van Ness Avenue. Additionally, the overall average wind speed for all test points in the vicinity of the proposed campus would be reduced from 10.6 mph to 10.5 mph. Because the total number of locations of exceedances would not change and the overall average wind speed in the Cathedral Hill area would decrease, effects at the proposed Cathedral Hill Campus would not be substantial compared to existing conditions. However, this wind tunnel analysis is conservative because wind buffering effects by streetscape elements (notably trees) are not accounted for. Implementing the LRDP at the Cathedral Hill Campus by 2015 would not increase the total number of locations that would exceed the pedestrian-comfort criterion (11 mph), and it would not result in an exceedance of the wind-hazard criterion (26 mph). Therefore, **this impact would be less than significant**.

As noted, no proposed exterior change to the building at 1375 Sutter Street would occur under the proposed LDRP; therefore, no change in existing wind conditions would result. Accordingly, no impact would occur at that part of the Cathedral Hill Campus. Additionally, the proposed tunnel beneath Van Ness Avenue connecting the proposed Cathedral Hill Hospital and Cathedral Hill MOB would be entirely below surface and would have no impact on the surface wind environment.

The proposed streetscape changes, including the proposed trees along all streets bordering the Cathedral Hill Campus, would have an ameliorating effect on wind conditions. Street trees generally would not be expected to substantially reduce wind, especially in winter when deciduous trees (such as big-leaf maples) have little leaf canopy. However, because more trees are proposed at the Cathedral Hill Campus under the LRDP than currently exist at the campus and would create a more continuous canopy, some increased wind reduction benefit would occur at street level during summer. As noted, the wind modeling does not account for reduction in wind conditions related to street trees in the Cathedral Hill area (for existing or proposed LRDP conditions).

Cathedral Hill Campus with No Van Ness Avenue Pedestrian Tunnel Variant: Removing the Van Ness Avenue pedestrian tunnel from near-term projects under this project variant would not alter project effects related to wind because wind effects would not be caused by construction of the below-ground pedestrian tunnel. Therefore, for the same reasons as discussed above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the proposed Cathedral Hill Campus in the near term.

◆ Davies Campus

A wind impact evaluation[18] was prepared to evaluate the changes in existing wind conditions that would occur as a result of the near-term LRDP projects at the Davies Campus. The results of this evaluation are discussed below.

Because the existing 84-foot-tall (including mechanical penthouse) Davies Hospital North and South Towers are located upwind, the proposed 61-foot-tall (at maximum height, as measured to the top of the parapet from the centerline of the east façade from 14th Street) Neuroscience Institute building would be sheltered from prevailing winds. Because of the sheltering effect of existing buildings and terrain, and the limited height of the proposed Neuroscience Institute building, only minor increases in wind speed would occur in pedestrian spaces adjacent to this proposed building. Based on the exposure, massing, and orientation of the proposed Neuroscience Institute building, the wind impact evaluation determined that no substantial changes to the wind environment would occur in pedestrian areas adjacent to or near this building. Additionally, the proposed building would be less than 80 feet tall, the commonly acknowledged soft threshold for potential adverse wind impacts. Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the near term.

◆ St. Luke’s Campus

A wind impact evaluation[19] was prepared to evaluate the changes in existing wind conditions that would occur as a result of the proposed LRDP development at the St. Luke’s Campus. The results of this evaluation are considered in the impact discussions below.

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[18] Ballanti, D. 2009 (September 15). *Wind Impact Evaluation for the Proposed CPMC Long Range Development Plan, Davies Campus, San Francisco.* El Cerrito, CA. Letter report to Tammy Chan, Senior Environmental Planner, AECOM. San Francisco, CA. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, as part of Case No. 2005.0555E.

Demolishing the surface parking lot and renovating the interiors of existing buildings at the St. Luke's Campus would not have the potential to alter existing wind conditions in the area. The proposed 99-foot-tall (including mechanical penthouse) St. Luke's Replacement Hospital building would extend across San Jose Avenue, into what is currently the open parking lot at the northwest corner of the campus. Because of the existing three- to four-story off-campus structures (up to approximately 50 feet tall) upwind from the site of the proposed St. Luke's Replacement Hospital, only the upper floors of the proposed replacement hospital would extend above adjacent existing structures and be exposed to winds. Although the St. Luke's Replacement Hospital would have a wider west face than the existing 69-foot-tall (including mechanical penthouse) St. Luke's Hospital tower, the proposed building would be 99 feet tall (at maximum height as measured from Cesar Chavez Street), which is 70 feet shorter than the height of the existing 169-foot-tall hospital tower. Therefore, the replacement hospital would intercept and deflect less wind to street level than the existing hospital tower. Because of the sheltering effect of existing surrounding buildings and terrain, and the relatively shorter height of the proposed replacement hospital, only minor wind accelerations would be expected in pedestrian spaces around the proposed St. Luke's Replacement Hospital.

The proposed five-story, 100-foot-tall (including mechanical penthouse) MOB/Expansion Building would be shorter than the existing 12-story, 169-foot-tall (including mechanical penthouse) St. Luke's Hospital tower that it would replace. It would also be of similar height as and sheltered by the St. Luke's Replacement Hospital building. Therefore, the proposed MOB/Expansion Building would intercept and deflect less wind to street level than the existing hospital tower, which is on the same site on campus. This would be a reduction in effect from the existing wind conditions at the St. Luke's Campus in the near term.

Based on the exposure, massing, and orientation of the buildings proposed for the St. Luke's Campus, the wind impact evaluation determined that no substantial adverse changes to the wind environment would occur in pedestrian areas adjacent to or near the campus with implementation of the LRDP. **This impact would be less than significant**.

St. Luke's Campus Projects with Project Variants: With implementation of either project variant for the St. Luke's Campus, the proposed Replacement Hospital would still be five stories and 99 feet tall (including mechanical penthouse) and the proposed MOB/Expansion Building would still be five stories and 100 feet tall (including mechanical penthouse). No aboveground physical changes would occur under either project variant that would not occur under the proposed LRDP. As a result, the project variants themselves would not result in any adverse wind impacts. Therefore, for the same reasons as discussed above, **this impact would be less than significant**.

[19] Ballanti, D. 2009 (February 19). *Wind Impact Evaluation for the Proposed CPMC Long Range Development Plan, St. Luke's Campus, San Francisco.* El Cerrito, CA. Letter report to Tammy Chan, Senior Environmental Planner, AECOM. San Francisco, CA. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, as part of Case No. 2005.0555E.

Mitigation Measure: No mitigation or improvement measures are required at the St. Luke's Campus in the near term.

Long-Term Projects

Wind impact evaluations[20, 21] were prepared to evaluate the changes in wind that would occur with implementation of the long-term LRDP projects at the Pacific and Davies Campuses by 2030. In the interim period before design of the long-term LRDP projects is completed, thresholds of significance could change or the project design and siting could be substantially revised. Accordingly, long-term projects described in this EIR would be subject to additional project-specific environmental review under CEQA, after more detailed design information is available. This subsequent environmental review would take into account any changes in the environmental setting that could affect the significance determination. However, impacts for long-term projects are presented below based on the currently proposed designs and the results of the wind impact evaluations based on those designs.

◆ Pacific Campus

Renovation of the 2333 Buchanan Street Hospital to become the proposed ACC would not involve altering the exterior of the building; therefore, no impacts related to wind would occur. The proposed 138-foot-tall (including mechanical penthouse) ACC Addition would be the same height as the existing 138-foot-tall (including mechanical penthouse) 2333 Buchanan Street Hospital (which would become the ACC); however, the ACC Addition would be downhill from and at a lower elevation than the existing ACC, with a smaller west-facing façade. As a result, the proposed ACC Addition would deflect less wind to street level.[22] Because of the existing upwind five-story 71-foot-tall (including mechanical penthouse) 2200 Webster Street Gerbode Research Building, only the upper floors of the proposed ACC Addition would rise above the adjacent on- and off-campus structures and be exposed to winds. The proposed ACC Addition would also provide wind shelter to the ACC building (i.e., renovated 2333 Buchanan Street Hospital), reducing any wind impacts at street level currently created by that existing structure. Only minor wind accelerations would be expected in pedestrian spaces around the proposed ACC Addition, and these would not constitute a significant adverse wind impact.

The proposed 85-foot-tall (including mechanical penthouse) North-of-Clay Aboveground Parking Garage would have open upwind- and downwind-facing (west- and east-facing, respectively) façades, which would allow the

[20] Ballanti, D. 2009 (September 15). *Wind Impact Evaluation for the Proposed CPMC Long Range Development Plan, Pacific Campus, San Francisco.* El Cerrito, CA. Letter report to Tammy Chan, Senior Environmental Planner, AECOM. San Francisco, CA. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, as part of Case No. 2005.0555E.

[21] Ballanti, D. 2009 (September 15). *Wind Impact Evaluation for the Proposed CPMC Long Range Development Plan, Davies Campus, San Francisco.* El Cerrito, CA. Letter report to Tammy Chan, Senior Environmental Planner, AECOM. San Francisco, CA. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, as part of Case No. 2005.0555E.

[22] Ballanti, D. 2009 (September 15). *Wind Impact Evaluation for the Proposed CPMC Long Range Development Plan, Pacific Campus, San Francisco.* El Cerrito, CA. Letter report to Tammy Chan, Senior Environmental Planner, AECOM. San Francisco, CA. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, as part of Case No. 2005.0555E.

building to be ventilated with access to open air. Accordingly, wind would flow through it. Because of their open façades, parking garages do not generate the pressure differences between the upwind and downwind sides that are typical of solid buildings, which are what drive the acceleration of winds around to the base of a building (street level). As a result, constructing the North-of-Clay Aboveground Parking Garage would not have the potential to generate strong wind accelerations.

Based on the exposure, massing, and orientation of the buildings proposed for development at the Pacific Campus under the LRDP, the wind impact evaluation determined that no substantial changes to the wind environment would occur in pedestrian areas adjacent or near the campus. As stated previously, however, the LRDP development described in this EIR, including that for Pacific Campus, would be subject to additional project-specific environmental review under CEQA. Mitigation would be provided if needed to reduce any significant impacts to a less-than-significant level. Therefore, implementing the LRDP at the Pacific Campus is not anticipated to result in substantial changes to the wind environment in pedestrian areas adjacent to or near the site. **This impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific Campus in the long term.

◆ Davies Campus

The proposed 45-foot-tall (including mechanical penthouse) Castro Street/14th Street MOB would be similar in height to the three- and four-story (up to approximately 45 feet tell) upwind residential structures across Castro Street. Because of the sheltering effect of these existing residential buildings on the site of the proposed MOB, the terrain that slopes steeply to the west, and the moderate height of the proposed MOB building, only minor wind accelerations in pedestrian spaces around the proposed structure would occur. The building would have an approximate north-south axis parallel to Castro Street and perpendicular to the prevailing west wind and would occupy about one-half of the block between Duboce Avenue and 14th Streets. This massing and orientation would have the tendency to deflect winds down to the street, but the height of the building and reduction in wind created by buildings across Castro Street would not create a substantial windy condition.

Based on the exposure, massing, and orientation of the buildings developed at the Davies Campus by 2030, including the Neuroscience Institute building and the Castro Street/14th Street MOB, the wind impact evaluation determined that no substantial adverse changes to the wind environment in pedestrian areas adjacent to or near the MOB site would occur. As stated previously, long-term projects described in this EIR would be subject to additional project-specific environmental review under CEQA. Mitigation would be provided if needed to reduce any significant impacts to a less-than-significant level. Therefore, implementing the LRDP at the Davies Campus in the long term is not anticipated to result in substantial changes to the wind environment in pedestrian areas adjacent to or near the site. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the long term.

IMPACT WS-2

The project would not create net new shadow in a manner that would substantially affect the use of any park or open space under the jurisdiction of the San Francisco Recreation & Park Department, publicly accessible open space, outdoor recreation facility, or other public area or change the climate in either the community or the region. (Significance Criteria 9b and 9c)

Levels of Significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

In the summer, as the sun rises in the east, morning shadows are cast to the west. Shadows decrease until noon as the sun moves higher across the sky, and extend generally to the east in the afternoon and evening as the sun sets in the west. The noon zenith is highest in the sky; therefore, the midmorning to midafternoon shadows cast during summer are the shortest of the year. Long shadows occur in the early morning and late afternoon. In the winter, the sun is lower in the sky at the zenith and the shadows cast in the midmorning to midafternoon are greater. As the winter sun rises to the east-southeast, shadows are cast to the west-northwest. As the sun moves across the sky, shadows move from the west-northwest in the morning, to the north at noon, and to the east-northeast as the sun sets. Summer and winter are the periods with the greatest differences in shadow effects. Autumn and spring shadows are intermediate in their extent compared to summer and winter, and the maximum and minimum shadows are the same in both seasons.

This analysis includes shadows that may be cast on public open spaces; privately owned, publicly accessible open spaces; and sidewalks near the existing and proposed CPMC campuses. Note that the shadow graphics are turned 90 degrees, with North located along the left side of the image.

Near-Term Projects

◆ Cathedral Hill Campus

The proposed 15-story Cathedral Hill Hospital would be approximately 269 feet (at maximum height, as measured from Van Ness Avenue at Post Street from the sidewalk to the top of the mechanical screen). The proposed nine-story Cathedral Hill MOB would be 169 feet (at maximum height, as measured from Geary Street near Polk Street). Because of their height, bulk, and location on the proposed Cathedral Hill Campus, the proposed Cathedral Hill Hospital and MOB buildings would likely cast shadows on adjacent sidewalks (along Post Street, Van Ness Avenue, and Franklin Street and along Post Street, Van Ness Avenue, Polk Street, and Geary Street, respectively) and nearby developments at different times of day and different times of the year.

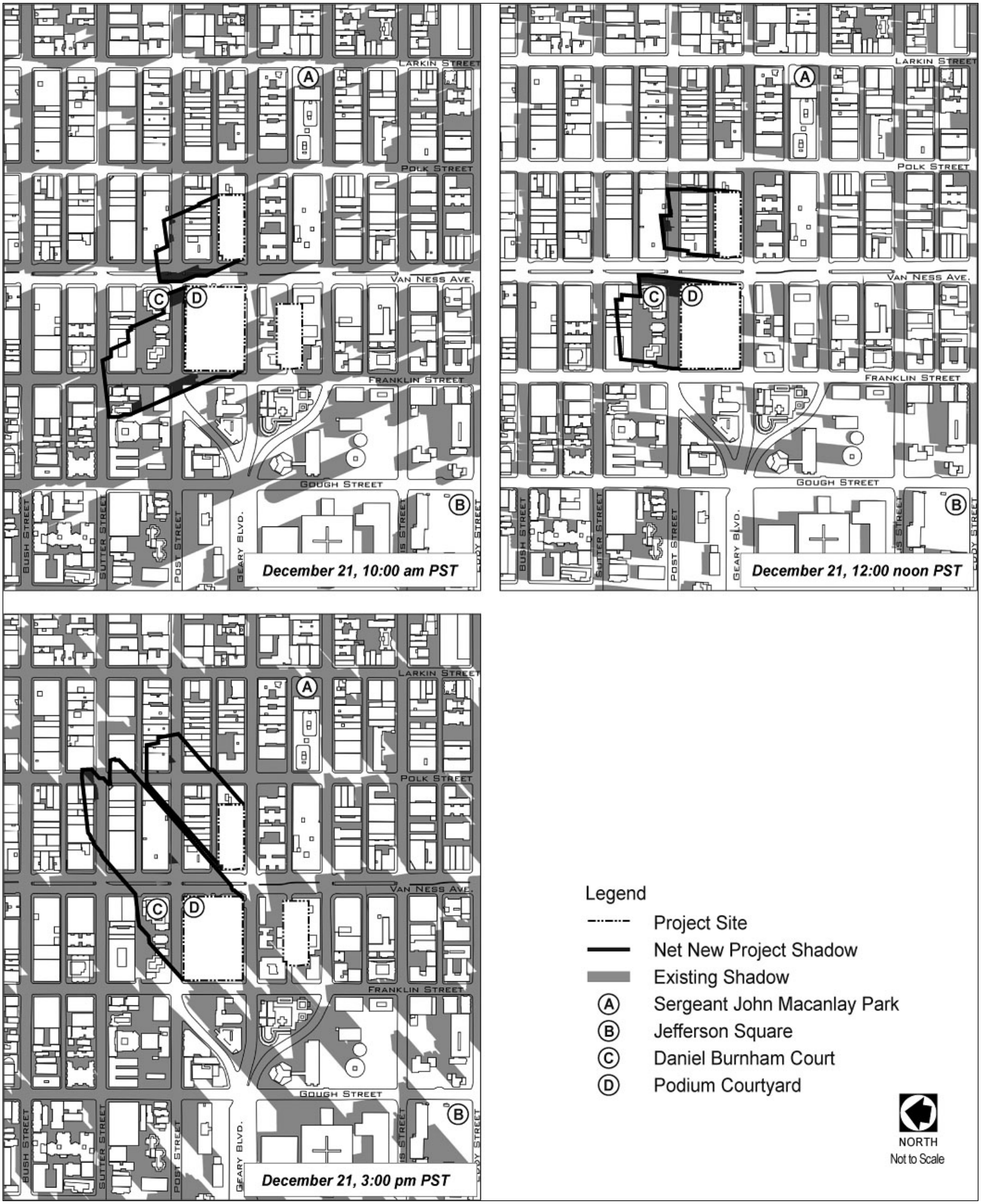
A Proposition K shadow study for the proposed Cathedral Hill Campus was conducted by the San Francisco Planning Department based on the size and location of the proposed structures. The shadow fan prepared for the study determined that shadow from the proposed Cathedral Hill Hospital would have the potential to reach Sergeant John Macaulay Park and the Tenderloin Recreation Center, and shadow from the proposed Cathedral Hill MOB would have the potential to reach the Sergeant John Macaulay Park playground. The Planning Department's analysis assumed no variation in the height of the proposed structures, and it used the tallest height of the building (269 feet for the proposed hospital and 169 feet for the proposed MOB). The department's analysis is conservative and does not account for the presence of existing buildings that may block new shadow resulting from the proposed development sites; therefore, new shadows that are cast by the proposed LRDP development at the Cathedral Hill area may be masked by shadows cast by existing buildings. In cases where an existing shadow masks the proposed project shadow, no net change in shadow would result at the receiving point and no impact would occur as a result of the LRDP. The shadow fan analysis[23] determined that the proposed Cathedral Hill Hospital and Cathedral Hill MOB would result in zero square foot–hours of net new shadow on open spaces subject to Section 295 of the Planning Code (the Sunlight Ordinance), including Sergeant John Macaulay Park and the Tenderloin Recreation Center.

In addition to the shadow fan analysis (which calculates a conservative structure, using the tallest height of the building uniformly across the entire footprint, as described above), shadow projections, which show the actual shadows that would result from the specific building design, were prepared for the proposed development at the Cathedral Hill Campus. Shadow simulations for the proposed buildings are shown in Figure 4.9-2, "Cathedral Hill Hospital and MOB—Projected Winter Shadows" through Figure 4.9-5, "Cathedral Hill Hospital and MOB—Projected Fall Shadows" (pages 4.9-35 through 4.9-38). Shadows from existing structures are shown in gray and the net new shadows created by the proposed buildings are shown in black for the four seasons.

Winter Solstice (December 21)

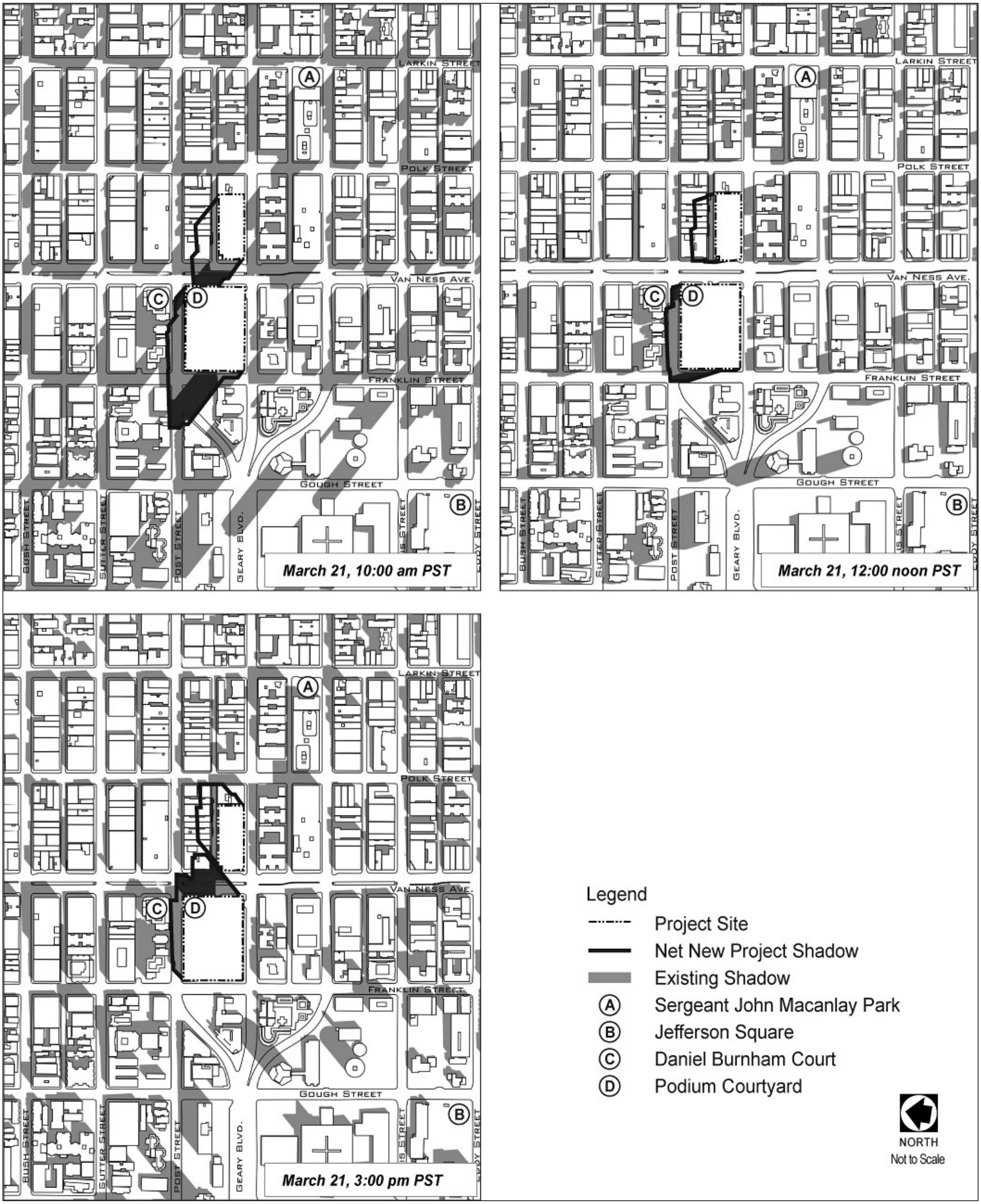
The simulations prepared for December 21, the day on which shadows are longest (Figure 4.9-2, page 4.9-35) show that the proposed Cathedral Hill Hospital and MOB would cast shadows in the following directions at this time of year:

[23] Data compiled by CADP Consulting in 2010.



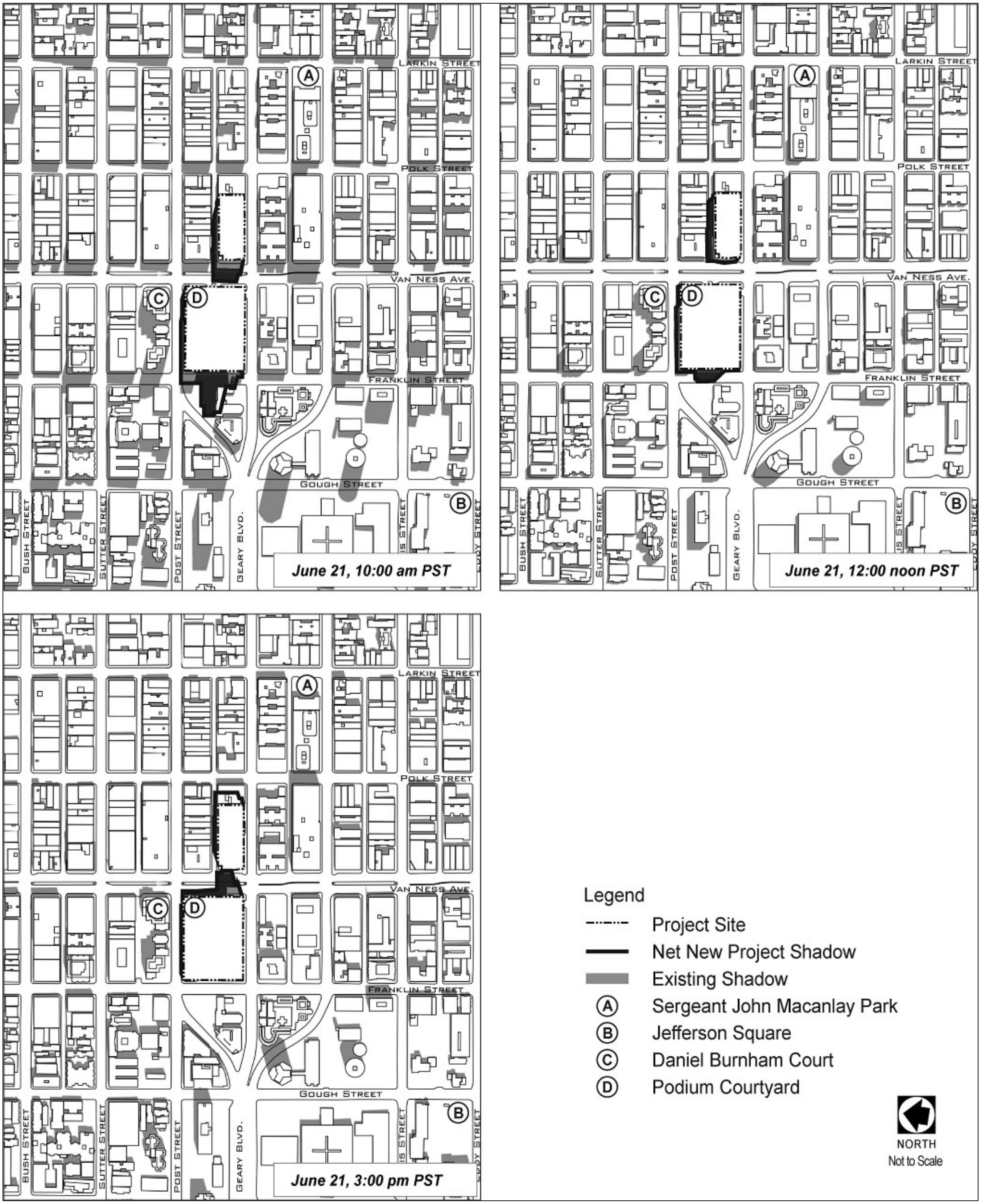
Sources: Data compiled by AECOM and CADP Consulting in 2010

Cathedral Hill Hospital and MOB—Projected Winter Shadows **Figure 4.9-2**



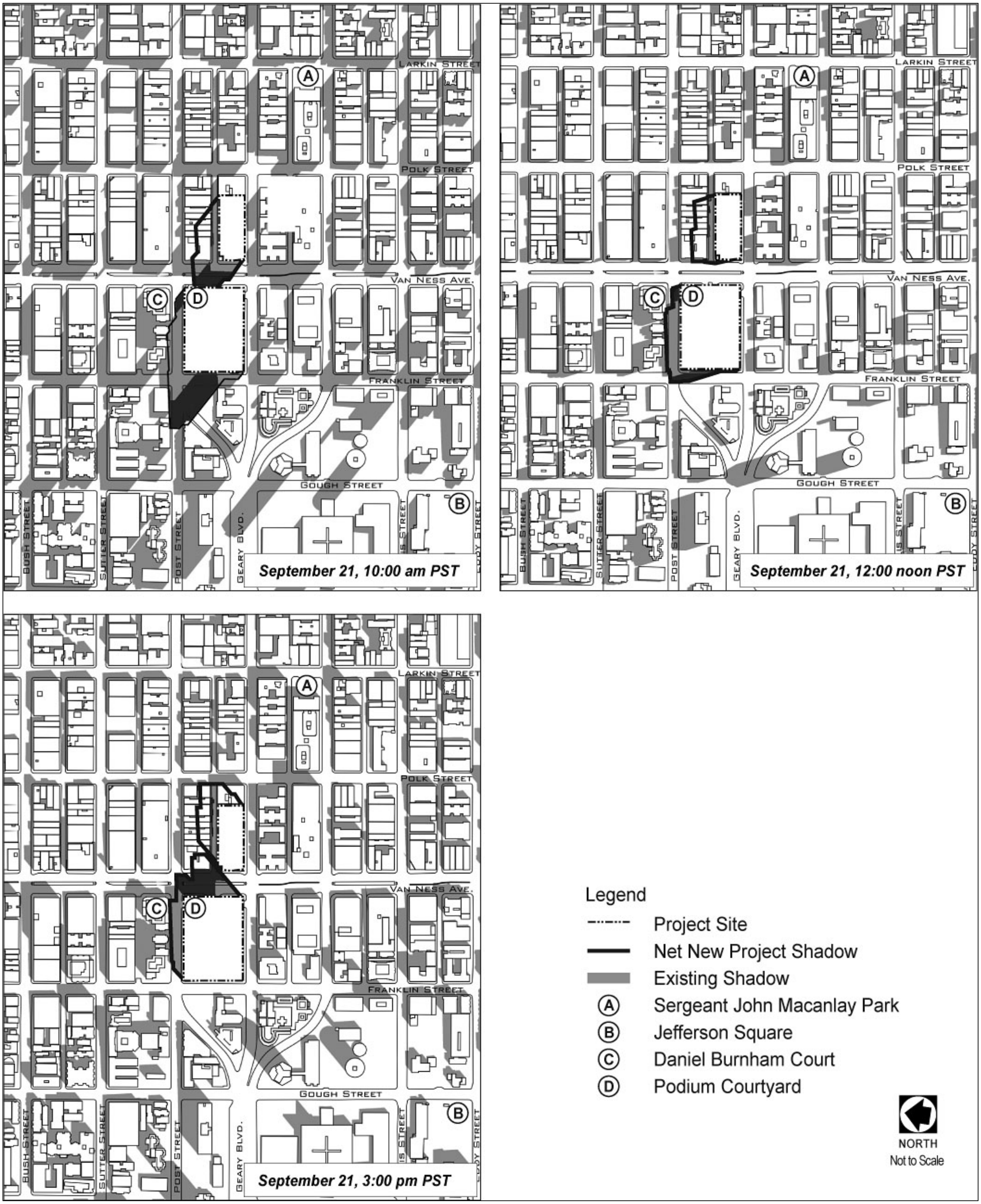
Sources: Data compiled by AECOM and CADP Consulting in 2010

Cathedral Hill Hospital and MOB—Projected Spring Shadows **Figure 4.9-3**



Sources: Data compiled by AECOM and CADP Consulting in 2010

Cathedral Hill Hospital and MOB—Projected Summer Shadows **Figure 4.9-4**



Sources: Data compiled by AECOM and CADP Consulting in 2010

Cathedral Hill Hospital and MOB—Projected Fall Shadows **Figure 4.9-5**

- At 10 a.m.—net new shadows from the proposed Cathedral Hill Hospital would fall on the courtyard on the roof of the hospital's podium; on the sidewalks on both sides of Post Street and Franklin Street; and on a surface parking lot in the northeast portion of the block bounded by Sutter Street to the north, Franklin Street to the east, Post Street to the south, and Gough Street to the west. Net new shadows from the proposed Cathedral Hill MOB would fall on the western sidewalk of Van Ness Avenue and sidewalks on both sides of Post Street near Van Ness Avenue.

- *At noon*—net new shadows from the proposed Cathedral Hill Hospital would fall on the courtyard on the roof of the hospital's podium and on the sidewalks on both sides of Post Street and the west side of Van Ness Avenue. Net new shadows from the proposed Cathedral Hill MOB would fall on the northern sidewalk across Post Street from the proposed MOB.

- *At 3 p.m.*—net new shadows from the proposed Cathedral Hill Hospital would fall on the courtyard on the roof of the hospital's podium and on a small part of the northern sidewalk of Post Street, and small parts of the sidewalks on both sides of Polk Street and Sutter Street at their intersection. Net new shadows from the proposed Cathedral Hill MOB would fall on a small part of the north sidewalk of Post Street.

The winter shadows from the proposed Cathedral Hill Hospital and MOB would not reach any open spaces and/or other public open space off-campus or publicly accessible open space/recreational facilities subject to Section 295 of the Planning Code (the Sunlight Ordinance) on December 21. The proposed hospital would cast shadows on the private rooftop terrace at Daniel Burnham Court; however, shadows from the existing Cathedral Hill Hotel currently fall on this location. The new hospital's shadow would not be substantially different from the existing hotel's shadow, and the usability of this terrace space at Daniel Burnham Court would not decrease. Additionally, the hospital tower would cast shadows at all times of the day on the courtyard on the roof of the hospital's five-story podium; however, the courtyard is intended as a nonrecreational outdoor courtyard adjacent to the hospital's indoor public waiting area. The courtyard is intended to serve as an outdoor extension to the visitor waiting area, and self-shading of the proposed development would not affect the intended usability of this space. As shown in Figure 4.9-2, constructing the proposed Cathedral Hill Hospital and Cathedral Hill MOB would result in net new shadow on the sidewalks of Post Street, Franklin Street, Van Ness Avenue, Polk Street, and Sutter Street.

Spring Equinox (March 21)

The simulations prepared for March 21 (Figure 4.9-3, page 4.9-36) show that the Cathedral Hill Hospital and MOB would cast shadows in the following directions at this time of year:

- *At 10 a.m.*—net new shadows from the proposed Cathedral Hill Hospital would fall on the courtyard on the roof of the hospital's podium and on the sidewalks on both sides of Post Street and Franklin Street. Net new shadows from the proposed Cathedral Hill MOB would fall on the courtyard on the roof of the hospital's podium, a portion of the Van Ness Avenue hospital frontage, and on the sidewalk on the west side of Van Ness Avenue.

- *At noon*—net new shadows from the proposed Cathedral Hill Hospital would fall on the courtyard on the roof of the hospital's podium and on the sidewalks on both sides of Post Street and Franklin Street. Net new shadows from the proposed Cathedral Hill MOB would fall on Cedar Street and the east side of Van Ness Avenue.

- *At 3 p.m.*—net new shadows from the proposed Cathedral Hill Hospital would fall on the courtyard on the roof of the hospital's podium and on the sidewalks on both sides of Van Ness Avenue, the south side of Post Street, and on Cedar Street. Net new shadows from the proposed Cathedral Hill MOB would fall on the north sidewalk of Cedar Street.

The shadows from the proposed Cathedral Hill Hospital and Cathedral Hill MOB would not reach any open spaces subject to Section 295 of the Planning Code (the Sunlight Ordinance) or other public open space or recreation spaces or publicly accessible open space or recreational space off campus on March 21. The hospital tower would cast shadows on the courtyard on the roof of the hospital's podium during the afternoon, and the courtyard would be partially shaded during the morning and midday hours; however, the courtyard is intended as a nonrecreational outdoor courtyard adjacent to the hospital's indoor public waiting area. The courtyard is intended to serve as an outdoor extension to the visitor waiting area, and self-shading of the development would not affect the intended usability of this space. As shown in Figure 4.9-3, net new shadows from the proposed Cathedral Hill Hospital would fall on the sidewalks of Post Street, Franklin Street, Van Ness Avenue, and Cedar Street. Net new shadow from the proposed Cathedral Hill MOB would fall on the sidewalks of Van Ness Avenue and Cedar Street.

Summer Solstice (June 21)

The simulations prepared for June 21, the day on which shadows are shortest (Figure 4.9-4, page 4.9-37), show that the Cathedral Hill Hospital and MOB would cast shadows in the following directions at this time of year:

- *At 10 a.m.*—net new shadows from the proposed Cathedral Hill Hospital would fall on the courtyard on the roof of the hospital's podium and on both sides of Franklin Street. Net new shadows from the proposed Cathedral Hill MOB would fall on the sidewalks of the west side of Van Ness Avenue and both sides of Cedar Street.

- *At noon*—net new shadows from the proposed Cathedral Hill Hospital would fall on the courtyard on the roof of the hospital's podium and on the sidewalks on both sides of Franklin Street and the south side of Post

Street. Net new shadows from the proposed Cathedral Hill MOB would fall on the sidewalks on the east side of Van Ness Avenue and both sides of Cedar Street.

- *At 3 p.m.*—net new shadows from the proposed Cathedral Hill Hospital would fall on the courtyard on the roof of the hospital's podium and on the sidewalks of the south side of Post Street and west side of Van Ness Avenue and both sides of Cedar Street. Net new shadows from the proposed Cathedral Hill MOB would fall on the north side sidewalk of Cedar Street.

The shadows from the proposed Cathedral Hill Hospital and Cathedral Hill MOB would not reach any open spaces subject to Section 295 of the Planning Code (the Sunlight Ordinance) or other public open spaces or recreational spaces or publicly accessible open space or recreational spaces off-campus on June 21. The hospital tower would partially shade the courtyard on the roof of the hospital's podium during all hours of the day; however, the courtyard is intended as a nonrecreational outdoor courtyard adjacent to the hospital's indoor public waiting area. The courtyard is intended to serve as an outdoor extension to the visitor waiting area, and self-shading of the development would not affect the intended usability of this space. As shown in Figure 4.9-4, net new shadows from the proposed Cathedral Hill Hospital would fall on the sidewalks of Franklin Street and Van Ness Avenue. Net new shadows from the proposed Cathedral Hill MOB would fall on the sidewalks of Cedar Street and Van Ness Avenue.

Fall Equinox (September 21)

The simulations prepared for September 21 (Figure 4.9-5, page 4.9-38) show that the Cathedral Hill Hospital and MOB would cast shadows in the following directions at this time of year:

- *At 10 a.m.*—net new shadows from the proposed Cathedral Hill Hospital would fall on the courtyard on the roof of the hospital's podium and on the sidewalks on both sides of Post Street and Franklin Street. Net new shadows from the proposed Cathedral Hill MOB would fall on campus on the courtyard on the roof of the podium of the proposed hospital and on the sidewalks of the west side of Van Ness Avenue and Cedar Street.

- *At noon*—net new shadows from the proposed Cathedral Hill Hospital would fall on sidewalks on both sides of Post Street and Franklin Street. Net new shadows from the proposed Cathedral Hill MOB would fall on the sidewalks of Van Ness Avenue and Cedar Street.

- *At 3 p.m.*—net new shadows from the proposed Cathedral Hill Hospital would fall on the courtyard on the roof of the hospital's podium and on the sidewalks of Post Street, Van Ness Avenue, and Cedar Street, while net new shadows from the proposed Cathedral Hill MOB would fall on the sidewalks of Cedar Street.

The shadows from the proposed Cathedral Hill Hospital and Cathedral Hill MOB would not reach any open spaces subject to Section 295 of the Planning Code (the Sunlight Ordinance) or other public open space or recreation spaces or publicly accessible open space or recreational space off-campus on September 21. The hospital tower would cast shadows on the courtyard on the roof of the hospital's podium at all times of the day; however, the courtyard is intended as a nonrecreational outdoor courtyard adjacent to the hospital's indoor public waiting area. The courtyard is intended to serve as an outdoor extension to the visitor waiting area, and self-shading of the development would not affect the intended usability of this space. As shown in Figure 4.9-5, net new shadows from the proposed Cathedral Hill Hospital would fall on the sidewalks of Post Street, Franklin Street, Van Ness Avenue, and Cedar Street. Net new shadows from the proposed Cathedral Hill MOB would fall on the sidewalks of Van Ness Avenue and Cedar Street.

Summary

The proposed Cathedral Hill Hospital and Cathedral Hill MOB would add net new shadows on open space on campus and on sidewalks, streets, and neighboring rooftops near the proposed campus; however, these shadows would not affect open space protected by Section 295 of the Planning Code (the Sunlight Ordinance) or create net new shadows on other public or publicly accessible open spaces or recreational spaces not subject to Section 295. During the winter, shadows of the proposed hospital would shade a privately owned, usable open space not covered under Section 295 (the rooftop terrace at Daniel Burnham Court); however, this terrace is already shaded by the existing Cathedral Hill Hotel or by other nearby structures and no net new shadow would be created (see Figure 4.9-2). Thus, the recreational use of this space would not decrease substantially compared with existing conditions. The courtyard on the roof of the hospital's podium would be shaded by the hospital tower throughout the year and by the MOB in the spring and summer mornings; however, the courtyard would be a nonrecreational outdoor courtyard adjacent to the hospital's indoor public waiting area. The courtyard would serve as an outdoor extension to the visitor waiting area; self-shading of the development under the LRDP would not affect the intended usability of this space. The LRDP's shadow impact on this space would be less than significant.

The extent and duration of shadow on sidewalks along Post Street, Franklin Street, Van Ness Avenue, and Cedar Street would increase during certain periods of the day and year as a result of the Cathedral Hill Hospital and MOB. However, these net new shadows would not exceed shadows that would be normal and expected in highly urban areas.

Although the proposed Cathedral Hill Campus would result in an increase in net new shadows in the vicinity, no public outdoor recreational facilities or other publicly accessible open spaces and recreational spaces would be substantially affected by development under the LRDP. Shadows from the Cathedral Hill Hospital would reach privately owned open space (the Daniel Burnham Court rooftop); however, this location is already shaded by existing Cathedral Hill Hotel and other nearby structures and no substantial net new project-related shadows would be created at this location. The amount of net increase in shadows near the proposed campus as a result of the LRDP would be minor in comparison to the amount of existing shadows in the campus vicinity, in the near term (2015), as shown in Figures 4.9-2 through 4.9-5. This amount would not have the potential to alter the climate in the community or the region. Therefore, **this impact would be less than significant**.

Cathedral Hill Campus with No Van Ness Avenue Pedestrian Tunnel Variant: Shadows resulting from this project variant would be the same as described above. Thus, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the proposed Cathedral Hill Campus in the near term.

◆ Davies Campus

Near-term development at the Davies Campus would involve constructing the 61-foot-tall (at maximum height, as measured to the top of the parapet from the centerline of the east façade from 14th Street) Neuroscience Institute building. Because of its height, bulk, and location, this building would likely cast shadows on adjacent sidewalks (along Duboce Avenue and Noe Street) at different times of the day and times of the year. Shadow simulations are shown in Figure 4.9-6, "Neuroscience Institute—Projected Shadows, December 13, 3:35 p.m.," and Figure 4.9-7, "Neuroscience Institute—Projected Shadows, September 22, 5:00 p.m." (pages 4.9-44 and 4.9-45).

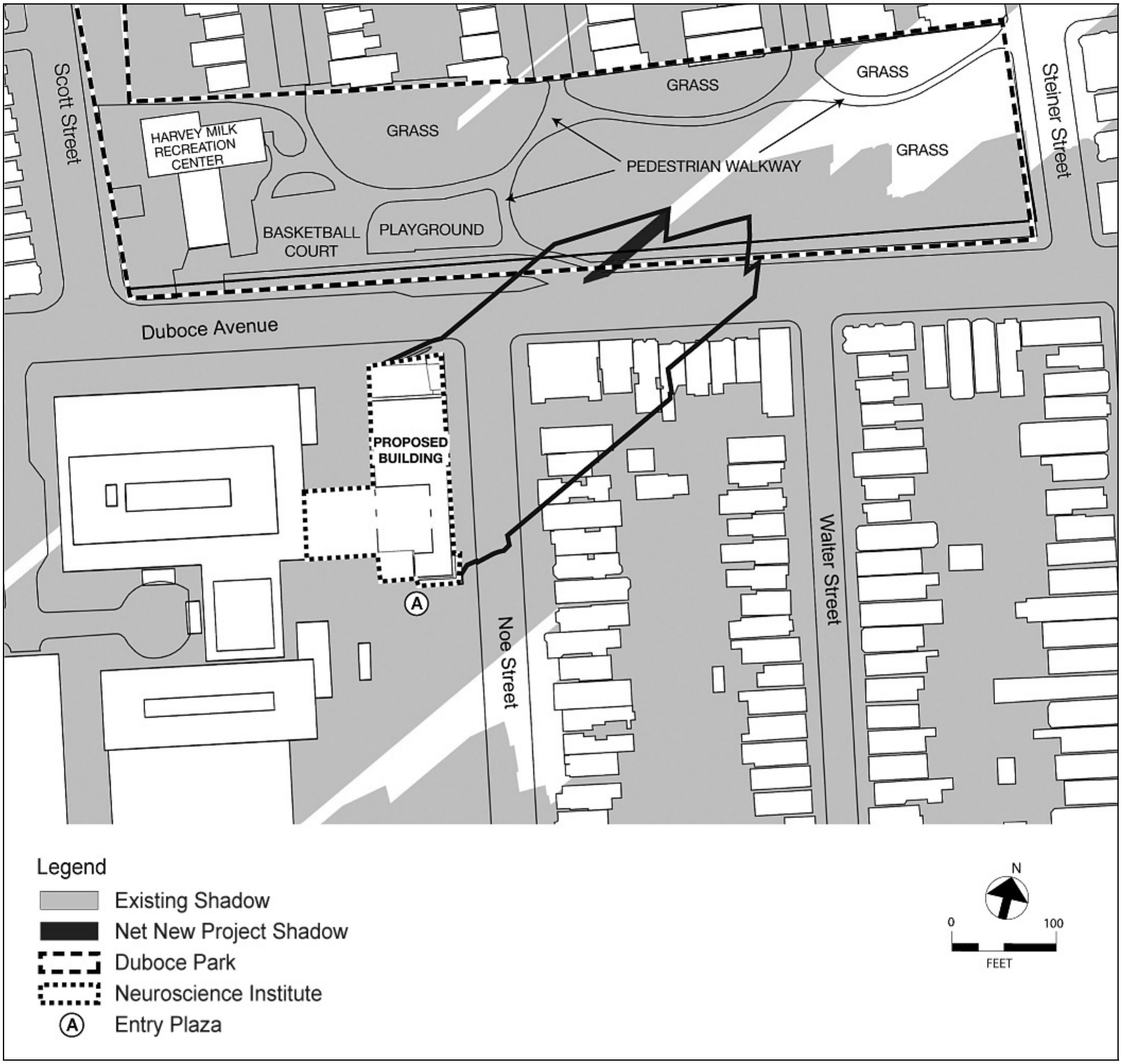
Winter

The simulations prepared for the winter (Figure 4.9-6, page 4.9-44) show that the proposed Neuroscience Institute building would cast shadows in the following directions at this time of year:

- *At 10 a.m.*—net new shadows would be cast on the sidewalk on the south side of Duboce Avenue.
- *At noon*—net new shadows would be cast on the sidewalk on the south side of Duboce Avenue.
- *At 3 p.m.*—net new shadows would be cast on the sidewalk on the south side of Duboce Avenue, the east and west sidewalks of Noe Street, and a small part of the south side of Duboce Park.

In December, the proposed Neuroscience Institute building would add net new shadows to the sidewalks on the east side of Noe Street and the south side of Duboce Avenue in the afternoon.[24] Additionally, shadows from the proposed building would fall on Duboce Park, which is under the jurisdiction of Section 295. Accordingly, a shadow fan analysis was prepared for the proposed building to quantify the impacts on Duboce Park. As shown in

[24] California Pacific Medical Center. 2006 (March 20). *Shadow Study and Memorandum prepared for the Noe Street Medical Office Building. San Francisco, CA.* Prepared by Turnstone Consulting, San Francisco, CA. This study and memorandum are on file with the San Francisco Planning Department, 1650 Mission Street, San Francisco, and are available for public review, as part of Case File No. 2004.0603E.



Source: California Pacific Medical Center. 2006 (March 20). *Shadow Study and Memorandum prepared for the Noe Street Medical Office Building.* San Francisco, CA. Prepared by Turnstone Consulting, San Francisco, CA. This study and memorandum are on file with the San Francisco Planning Department, 1650 Mission Street, San Francisco, and are available for public review, as part of the project Case File No. 2004.0603E.

Neuroscience Institute—Projected Shadows, December 13, 3:35 p.m. **Figure 4.9-6**

Source: California Pacific Medical Center. 2006 (March 20). *Shadow Study and Memorandum prepared for the Noe Street Medical Office Building. San Francisco, CA.* Prepared by Turnstone Consulting, San Francisco, CA. This study and memorandum are on file with the San Francisco Planning Department, 1650 Mission Street, San Francisco, and are available for public review, as part of the project Case File No. 2004.0603E.

Neuroscience Institute—Projected Shadows, September 22, 5:00 p.m. **Figure 4.9-7**

Figure 4.9-6 (page 4.9-45), the proposed Neuroscience Institute building would create net new shadows on a small portion of Duboce Park in the late afternoon for approximately 5 weeks in December and January. Duboce Park covers an area of approximately 4.3 acres (187,900 gross square feet) and receives 6,028,221 square foot–hours of sunlight (the total amount of sunlight that could potentially fall on the entire park during the entire year). Project shadow on the park would begin on approximately December 6 at 3:45 p.m. and last for about 15 minutes. Maximum shading would occur around December 13 at about 3:30 p.m., as shown in Figure 4.9-6, and would last for about 25–30 minutes. This shadowing of the park property would occur on an area of approximately 300 gross square feet of the dog-on-leash area for a maximum of 30 minutes. This would create net new shadow on approximately 0.2% of the total park area and add 156 square foot–hours of shade to the park, an increase of 0.0003%. This shadow would not fall on the playground or basketball court and would be unlikely to affect the recreational use of the park. Because of the small amount of increase in net new shadows and the brief times when the shadow would be created (late afternoon in winter months), this increase in net new shadows on Duboce Park would not substantially alter the use of the facility. No other recreational or public open spaces off-campus subject to Section 295 would be shaded during the winter months.

Spring

The shadow study[25] prepared for the previous application at the Davies Campus determined that the proposed Neuroscience Institute building would cast shadows in the following directions at this time of year:

- *At 10 a.m.*—net new shadows would be cast on the sidewalk on the south side of Duboce Avenue.
- *At noon*—no net new shadows would occur.
- *At 3 p.m.*—net new shadows would be cast on the east and west sidewalks of Noe Street.

The shadow from the proposed Neuroscience Institute building would not reach any open spaces subject to Section 295 of the Planning Code (the Sunlight Ordinance) or other public open space and publicly accessible open space or recreation spaces off campus during the spring. Net new shadows would fall on the sidewalks of Noe Street and Duboce Avenue.

Summer

The shadow study[26] prepared for the previous application at the Davies Campus determined that the proposed Neuroscience Institute building would cast shadows in the following directions at this time of year:

- *At 10 a.m.*—net new shadow would be cast on the sidewalk on the south side of Duboce Avenue.
- *At noon*—no net new shadow would occur.

[25] Ibid.
[26] Ibid.

- *At 3 p.m.*—net new shadows would be cast on the sidewalk on the east and west sidewalks of Noe Street.

The shadow from the proposed Neuroscience Institute building would not reach any open spaces subject to Section 295 of the Planning Code (the Sunlight Ordinance) or other public open space and publicly accessible open space or recreation spaces off-campus during the summer. Net new shadows would fall on the sidewalks of Noe Street and Duboce Avenue.

Fall

The simulations prepared for the fall (Figure 4.9-7, page 4.9-45) showed that the proposed Neuroscience Institute building would cast shadows in the following directions at this time of year:

- *At 10 a.m.*—net new shadows would be cast on the sidewalk on the south side of Duboce Avenue.
- *At noon*—no net new shadows would occur.
- *At 3 p.m.*—net new shadows would be cast on the east and west sidewalks of Noe Street.

The shadow from the proposed Neuroscience Institute building would not reach Duboce Park or any open spaces subject to Section 295 of the Planning Code (the Sunlight Ordinance) or other public open space and publicly accessible open space or recreation spaces off-campus during the fall and spring. Net new shadows would shade a portion of the Noe Street sidewalks in the late afternoon.

Summary

As described above, the proposed Neuroscience Institute building would add net new shadows that would fall on public open space (Duboce Park) protected by Section 295 of the Planning Code during the winter months. However, the minor increase in shade cast on a small portion of the park and of short duration in the late afternoon would not substantially affect the use of the park. The proposed building would not shade the Duboce Park playground or basketball court areas at any time during the year. The LRDP-related shadow, with development of the proposed Neuroscience Institute building in the near term (2015), would be of short duration and would not have a substantial impact on the use or enjoyment of Duboce Park. No other recreational or public open spaces off campus subject to Section 295 would be shaded during the winter months. The extent and duration of shadow on sidewalks along the streets adjacent to the Davies Campus would increase during certain periods of the day and year. However, these net new shadows would not exceed that which would be normal and expected in highly urban areas, and the new shadow on streets and sidewalks would be small compared to existing shadows cast by the existing nearby structures, and the Davies Hospital North and South Towers. Although the proposed Neuroscience Institute building would result in an increase in net new shadows in the vicinity, no outdoor recreational facilities or other publicly accessible open space would be substantially adversely affected by near-term development at the Davies Campus. Additionally, the minor amount of net increase in shadows would not have the potential to alter the climate in the community or the region. Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the near term.

◆ St. Luke's Campus

Near-term projects at the St. Luke's Campus would involve constructing the five-story, 99-foot-tall (at maximum height, as measured from Cesar Chavez Street) St. Luke's Replacement Hospital; demolishing the existing 12-story, 169-foot-tall (including 11-foot mechanical penthouse) St. Luke's Hospital tower; and constructing the five-story, 100-foot-tall (at maximum height, as measured from Cesar Chavez Street) MOB/Expansion Building in place of the existing hospital tower. Because of their height, bulk, and location on the campus, the proposed St. Luke's Replacement Hospital and MOB/Expansion Building would likely cast shadows on adjacent sidewalks (along Cesar Chavez and Valencia Streets) at different times of day and different times of the year.

A Proposition K shadow study for the St. Luke's Campus was conducted by the San Francisco Planning Department based on the size and location of the proposed LRDP structures. The shadow fan prepared for the study determined that shadow from the proposed St. Luke's Replacement Hospital and MOB/Expansion Building would not have the potential to reach any properties protected by Section 295 of the Planning Code.

In addition to the shadow fan analysis, which calculates a conservative structure as described above, shadow projections, which show the actual shadows which would result from a specific building design, were prepared for the proposed development at the St. Luke's Campus. Shadow simulations for the proposed buildings are shown in Figures 4.9-8 through 4.9-11 (pages 4.9-49 through 4.9-52). Shadows from existing structures are shown in gray and the new shadows created by the proposed St. Luke's Replacement Hospital and MOB/Expansion Building are shown in black. Note that the shadow graphics are rotated 90 degrees, that is, North is to the left side of the page.

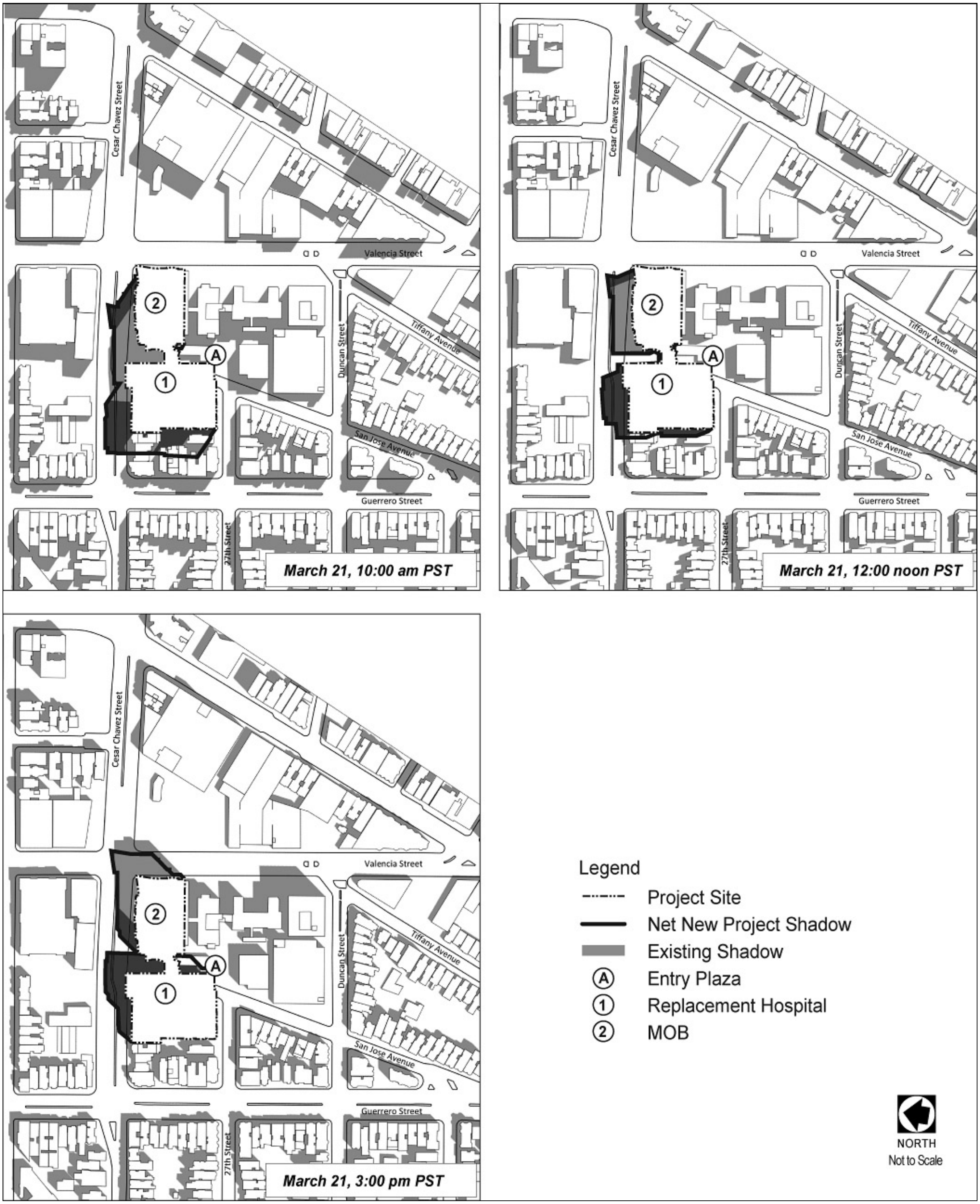
Winter Solstice (December 21)

The simulations prepared for December 21, the day on which shadows are longest (Figure 4.9-8), show that the new St. Luke's Replacement Hospital and MOB/Expansion Building would cast shadows in the following directions at this time of year:

- *At 10 a.m.*—net new shadows from the proposed St. Luke's Replacement Hospital would fall on the sidewalk on both sides of Cesar Chavez Street and portions of the sidewalks on Cesar Chavez Street. Net new shadows from the proposed MOB/Expansion Building also would fall on the sidewalks of Cesar Chavez Street.

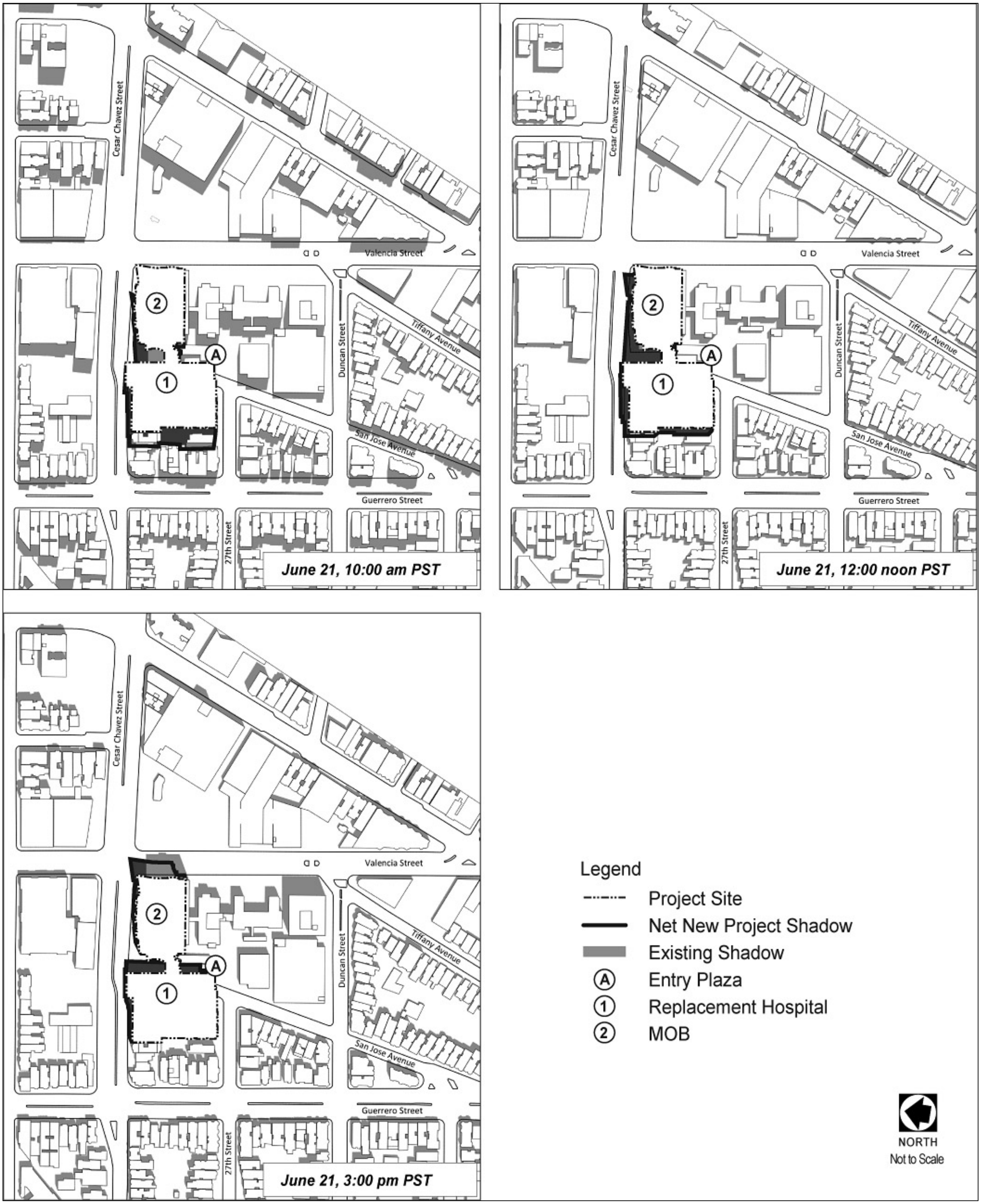
Source: Data compiled by AECOM and CADP Consulting in 2010

St. Luke's Replacement Hospital and MOB/Expansion Building—Projected Winter ShadowsFigure 4.9-8



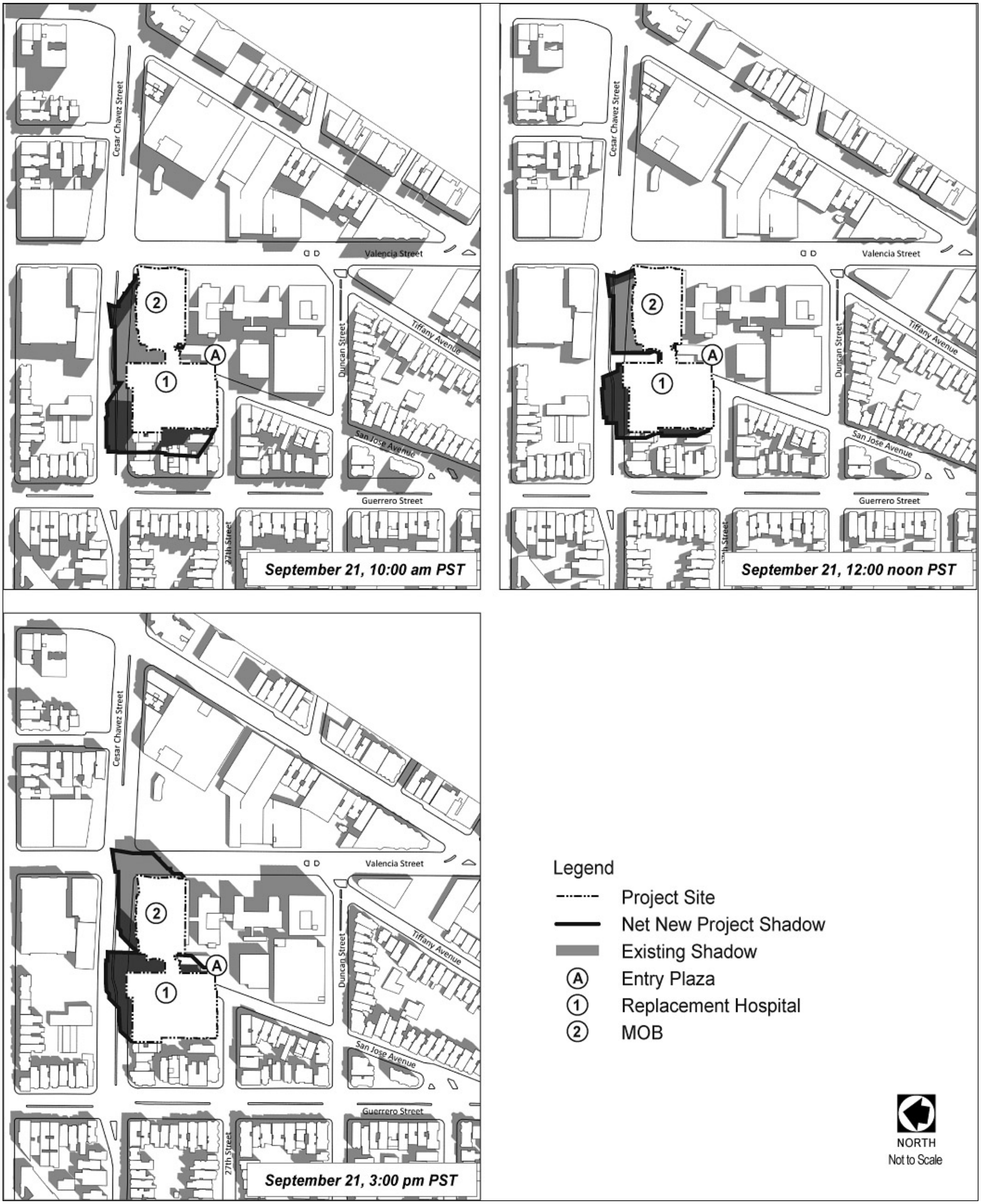
Source: Data compiled by AECOM and CADP Consulting in 2010

St. Luke's Replacement Hospital and MOB/Expansion Building—Projected Spring Shadows Figure 4.9-9



Source: Data compiled by AECOM and CADP Consulting in 2010

St. Luke's Replacement Hospital and MOB/Expansion Building—Projected Summer ShadowsFigure 4.9-10



Source: Data compiled by AECOM and CADP Consulting in 2010

St. Luke's Replacement Hospital and MOB/Expansion Building —Projected Fall ShadowsFigure 4.9-11

- *At noon*—net new shadows from the proposed St. Luke's Replacement Hospital would fall on the sidewalks on both sides of Cesar Chavez Street. Net new shadows from the proposed MOB/Expansion Building also would fall on the sidewalks of Cesar Chavez Street.

- *At 3 p.m.*—net new shadows from the proposed St. Luke's Replacement Hospital would fall on the proposed main entrance plaza, and on the sidewalks on both sides of Cesar Chavez Street. Net new shadows from the proposed MOB/Expansion Building also would fall on the sidewalks of Cesar Chavez Street and a small part of the Valencia Street sidewalk.

The shadow from the proposed St. Luke's Replacement Hospital and MOB/Expansion Building would not reach any open spaces subject to Section 295 of the Planning Code (the Sunlight Ordinance) or other public or publicly accessible open space or recreational space off-campus or create net new shadows on other public open spaces not subject to Section 295 on December 21. As shown in Figure 4.9-8 (page 4.9-49), net new shadow from the proposed LRDP development would shade the proposed main entrance plaza on the St. Luke's Campus and cast shadow on the sidewalks of Cesar Chavez Street and a small part of Valencia Street.

Spring Equinox (March 21)

The simulations prepared for March 21, the spring equinox (Figure 4.9-9, page 4.9-50), show that the new St. Luke's Replacement Hospital and MOB/Expansion Building would cast shadows in the following directions at this time of year:

- *At 10 a.m.*—net new shadows from the proposed St. Luke's Replacement Hospital would fall on portions of the sidewalks on both sides of Cesar Chavez Street, while net new shadows from the proposed MOB/Expansion Building would fall on the sidewalk on the south side of Cesar Chavez Street.

- *At noon*—net new shadows from the proposed St. Luke's Replacement Hospital would fall on the sidewalks on both sides of Cesar Chavez Street, while net new shadows from the proposed MOB/Expansion Building would fall on the proposed main entrance plaza and on the sidewalk on the south side of Cesar Chavez Street.

- *At 3 p.m.*—net new shadows from the proposed St. Luke's Replacement Hospital would fall on the proposed main entrance plaza and on the sidewalks on both sides of Cesar Chavez Street, while net new shadows from the proposed MOB/Expansion Building would fall on the sidewalk on the south side of Cesar Chavez Street.

The shadow from the proposed St. Luke's Replacement Hospital and MOB/Expansion Building would not reach any open spaces subject to Section 295 of the Planning Code (the Sunlight Ordinance) or other public or publicly accessible open space or recreation spaces off-campus on March 21. As shown in Figure 4.9-9, net new shadows from these proposed buildings would shade portions of the sidewalks of Cesar Chavez Street and the proposed main entrance plaza on campus.

Summer Solstice (June 21)

The simulations prepared for June 21, the day on which shadows are shortest (Figure 4.9-10, page 4.9-51) show that the St. Luke’s Replacement Hospital and MOB/Expansion Building would cast shadows in the following directions at this time of year:

- *At 10 a.m.*—net new shadows from the proposed St. Luke’s Replacement Hospital would fall on the sidewalk on the south side of Cesar Chavez Street. Net new shadows from the proposed MOB/Expansion Building would fall on the proposed main entrance plaza and on a part of the sidewalk on the south side of Cesar Chavez Street.

- *At noon*—net new shadows from the proposed St. Luke’s Replacement Hospital would fall on the sidewalk on the south side of Cesar Chavez Street. Net new shadows from the proposed MOB/Expansion Building would fall on the proposed main entrance plaza and on the sidewalk on the south side of Cesar Chavez Street.

- *At 3 p.m.*—net new shadows from the proposed St. Luke’s Replacement Hospital would fall on the proposed main entrance plaza and on the sidewalk on the south side of Cesar Chavez Street. Net new shadows from the proposed MOB/Expansion Building would fall on the sidewalk on the south side of Cesar Chavez Street and the west side of Valencia Street.

The shadows from the proposed St. Luke’s Replacement Hospital and MOB/Expansion Building would not reach any open spaces subject to Section 295 of the Planning Code (the Sunlight Ordinance) or other public or publicly accessible open space or recreation spaces off-campus on June 21. As shown in Figure 4.9-10 (page 4.9-51), net new shadows from the proposed buildings would fall on the proposed main entrance plaza on campus and a small portion of the sidewalk on the south side of Cesar Chavez and Valencia Streets.

Fall Equinox (September 21)

The simulations prepared for September 21 (Figure 4.9-11, page 4.9-52) show that the St. Luke’s Replacement Hospital and MOB/Expansion Building would cast shadows in the following directions at this time of year:

- *At 10 a.m.*—net new shadows from the proposed St. Luke’s Replacement Hospital would fall on the sidewalks on both sides of Cesar Chavez Street, while net new shadows from the proposed MOB/Expansion Building would fall on the sidewalk on the south side of Cesar Chavez Street.

- *At noon*—net new shadows from the proposed St. Luke's Replacement Hospital would fall on the sidewalk on both sides of Cesar Chavez Street. Net new shadows from the proposed MOB/Expansion Building would fall on the proposed main entrance plaza and on the sidewalk on the south side of Cesar Chavez Street.

- *At 3 p.m.*—net new shadows from the proposed St. Luke's Replacement Hospital would fall on the proposed main entrance plaza and on the sidewalk on the south side of Cesar Chavez Street. Net new shadows from the proposed MOB/Expansion Building would fall on the sidewalks on the south side of Cesar Chavez Street and the west side of Valencia Street.

The shadow from the proposed St. Luke's Replacement Hospital and MOB/Expansion Building would not reach any open spaces subject to Section 295 of the Planning Code (the Sunlight Ordinance) or other recreation spaces on September 21. As shown in Figure 4.9-11, net new shadows from the proposed St. Luke's Replacement Hospital and MOB/Expansion Building would fall on the proposed main entrance plaza space on campus and the sidewalks of Cesar Chavez Street. Net new shadows from the St. Luke's MOB/Expansion Building would also fall on the sidewalk on the east side of Valencia Street.

Summary

As described above, the proposed St. Luke's Replacement Hospital and MOB/Expansion Building would add net new shadows near the St. Luke's Campus; however, the new shadows would not affect open space protected by Section 295 of the Planning Code, other public or publicly accessible open space, and recreational space off campus, nor would they create net new shadow on other public open spaces subject to Section 295. Shadows created by the proposed St. Luke's Replacement Hospital and MOB/Expansion Building at the St. Luke's Campus would also fall on the campus within the area proposed as the replacement hospital's main entrance plaza. The proposed entrance plaza would operate as privately owned, publicly accessible open space. As shown in Figures 4.9-8 through 4.9-11 (pages 4.9-49 through 4.9-52), the proposed entrance plaza area on campus would be shaded in the afternoon hours. However, the entrance plaza is intended as a nonrecreational outdoor courtyard adjacent to the main hospital entrance. The courtyard is intended to serve as a landscaped walkway and not as recreational or open space, and self-shading of this proposed open space by development under the LRDP would not affect the intended usability of this space.

Morning and midday winter shadows from the proposed St. Luke's Replacement Hospital would also shade the sidewalks on portions of Cesar Chavez Street. The extent and duration of shadows on sidewalks along the streets adjacent to the St. Luke's Campus would increase during certain periods of the day and year. However, these net new shadows would not exceed that which would be normal and expected in highly urban areas. The proposed MOB/Expansion Building would create net new shadows on portions of both the north and south sidewalks along

Cesar Chavez Street and along the west sidewalk of Valencia Street. However, these net new shadows would also not exceed that which would be normal and expected in highly urban areas.

Although the proposed St. Luke's Replacement Hospital and MOB/Expansion Building would result in an increase in net new shadows in the vicinity, no outdoor recreational facilities or other public or publicly accessible open space or recreational space off campus would be substantially affected with near-term development at the St. Luke's Campus under the LRDP. Additionally, the minor amount of net increase in shadows would not have the potential to alter the climate in the community or region. **This impact would be less than significant**.

St. Luke's Campus with Project Variants: Effects related to shadows would not change with implementation of either of the project variants because no change would occur in above-ground development at the St. Luke's Campus with the variants. For the same reason as discussed above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the St. Luke's Campus in the near term.

Long-Term Projects

Long-term projects at the Pacific and Davies Campuses would be subject to the applicable shadow regulations and requirements in effect for the campuses at that time. More in-depth project-level EIR analyses for these projects would be conducted separately at a later date to address the potential impacts after more detailed design information is available. However, program-level impacts for these long-term developments proposed under the LRDP are presented below, based on the currently proposed designs of long-term development at the Pacific and Davies Campuses and the existing parks and open space currently under the jurisdiction of Section 295 of the San Francisco Planning Code (the Sunlight Ordinance).

◆ Pacific Campus

Long-term development at the Pacific Campus would involve constructing the proposed nine-story, 138-foot (including mechanical penthouse) ACC Addition and 85-foot (including mechanical penthouse) North-of-Clay Aboveground Parking Garage, and completing other on-campus building conversions and renovations. Based on the currently proposed design for the ACC Addition and North-of-Clay Aboveground Parking Garage and lack of proximity of these proposed structures to existing parks and open space under the jurisdiction of Section 295, significant impacts on parks and open space protected by Section 295 would not occur. The closest parks or open spaces subject to Section 295 are Lafayette Park and Cottage Row Mini Park, located 0.17 mile east and 0.18 mile south of the Pacific Campus, respectively. As shown in the figures detailing shadow projections for the proposed Cathedral Hill Campus (Figures 4.9-2 through 4.9-5, pages 4.9-35 through 4.9-38), shadows in the city are typically cast to the east, north, or west of buildings; therefore, similar structures proposed at the Pacific Campus under the LRDP would not have the potential to affect Cottage Row Mini Park because this park is south of the Pacific Campus. Given the distance of Lafayette Park from the campus (0.17 mile east), shadows would have the potential to reach the park during the winter afternoon hours when shadows are the longest of the year and fall toward the northeast.

No shadow projections were prepared for the proposed long-term projects at the Pacific Campus; however, a qualitative assessment of the potential of shadows from proposed campus buildings to reach Lafayette Park (as the proposed buildings are currently designed) can be conducted based on shadow patterns shown on the shadow patterns and projections prepared for LRDP development at other campuses. Accordingly, a comparison of the design of the long-term development at the Pacific Campus and its shadow potential to projections prepared for the proposed Cathedral Hill Hospital and MOB buildings is included below.

As shown in Figure 4.9-2 (page 4.9-35), the proposed 269-foot-tall Cathedral Hill Hospital (at maximum height as measured from Van Ness Avenue at Post Street from the sidewalk to the top of the mechanical screen) would cast winter afternoon shadows approximately 0.13 mile to the northeast. The existing 138-foot-tall (including mechanical penthouse) 2333 Buchanan Street Hospital building would be retained and converted to an ACC, with no change to its building envelope. Under the current design, the proposed 85-foot-tall (including mechanical penthouse) North-of-Clay Aboveground Parking Garage and proposed 138-foot-tall ACC Addition would be less than one-third as tall and slightly more than half as tall as the proposed 269-foot-tall Cathedral Hill Hospital, respectively. Shadows cast by these structures proposed for the Pacific Campus would be correspondingly shorter than those cast by the proposed Cathedral Hill Hospital. Lafayette Park is located 0.17 mile northwest from the Pacific Campus; potential shadows cast by the proposed North-of-Clay Aboveground Parking Garage and the ACC Addition would not have the potential to reach this park. Additionally, there are several buildings between the Pacific Campus and Lafayette Park, and the park is located uphill, which would also help prevent net new shadows from the proposed new Pacific Campus structures from reaching the park. As a result, it is not anticipated that net new shadows created by the long-term projects proposed for the Pacific Campus would affect any parks or open space under the jurisdiction of Section 295, and shadow impacts are anticipated to be less than significant. The closest open space not under the jurisdiction of Section 295 is the non-SFRPD Buchanan Street Mall, located 0.30 mile south of the campus. Shadows from long-term development at the Pacific Campus under the LRDP would not have the potential to reach this and other public open or publicly accessible open spaces because of the distance of these parks from the campus. Additionally, because shadows cast by the proposed structures at the Pacific Campus would be largely similar to those currently cast by existing on-campus structures, the LRDP would not have the potential to alter the climate in the community or the region.

As stated previously, however, development of long-term projects under the LRDP would be subject to additional project-specific environmental review under CEQA. The development would be required to comply with the

City's shadow regulations and requirements at the time long-term design plans for the Pacific Campus under the LRDP are completed, and mitigation would be provided if needed to reduce any significant shadow impacts to less-than-significant levels. Therefore, implementing the LRDP at the Pacific Campus in the long term is not anticipated to create net new shadows in a manner that would substantially adversely affect the use of any park or open space subject to Section 295, any publicly accessible private open space, any outdoor recreation facility, or any other public area, or that would change the climate in either the community or the region. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at the Pacific Campus in the long term.

◆ Davies Campus

The long-term development proposed for the Davies Campus would involve constructing the proposed three-story 45-foot-tall (including mechanical penthouse) Castro Street/14th Street MOB. Based on this building's proposed design and existing parks and open spaces in the vicinity under the jurisdiction of Planning Code Section 295, this development would not be expected to affect parks and open space protected by Section 295. The proposed Castro Street/14th Street MOB would replace the existing 30-foot-tall three-story Castro Street/14th Street Parking Garage resulting in increased shadow than under existing conditions. The proposed 45-foot-tall Castro Street/14th Street MOB would be separated from Duboce Park by the existing 84-foot-tall (including 18-foot mechanical penthouse) Davies Hospital North Tower and 77-foot-tall (including 10-foot mechanical penthouse) 45 Castro Street MOB. These taller structures, which currently cast shadows on Duboce Park, would block potential net new shadow on Duboce Park resulting from the new Castro Street/14th Street MOB. As a result, no parks or open space under the jurisdiction of Section 295 are anticipated to be affected by long-term projects at the Davies Campus. The on-campus Terrain Park is located between the existing on-campus parking garage and the existing Davies Hospital South Tower. The park is not accessible to the public and was designed to provide semi-outdoor space for rehabilitation activities. The proposed Castro Street/14th Street MOB would cast shadows on Terrain Park, but the park is already shaded by the existing Castro Street/14th Street Parking Garage on campus and the existing, taller 77-foot-tall (including 10-foot mechanical penthouse) 45 Castro Street MOB. Any net new shadows on the Terrain Park from the proposed Castro Street/14th Street MOB would not substantially affect the intended uses of the space because rehabilitation activities would still occur there.

Because shadows cast by the proposed Castro Street/14th Street MOB would be largely similar to those currently cast by the existing, similarly scaled parking garage, the long-term development at the Davies Campus under the LRDP would not have the potential to alter the shadow conditions and climate in the community or the region. Accordingly, impacts on existing parks and open space protected by Section 295 resulting from the proposed long-term projects at the Davies Campus would be anticipated to be less than significant.

As stated previously, however, long-term development under the LRDP would be subject to additional project-specific environmental review under CEQA. The development would be required to comply with the City's shadow regulations and requirements at the time long-term design plans are completed, and mitigation would be provided if needed to reduce any significant impacts to a less-than-significant level.

Additionally, near-term development by 2015 (the proposed Neuroscience Institute building) and long-term development by 2030 (the Castro Street/14th Street MOB) proposed under the LRDP would be located on separate portions of the campus, preventing the proposed structures from casting combined shadows on the same locations. Thus, full buildout of the LRDP (2030)—including both near-term and long-term development—would not combine to create substantial adverse shadow impacts on and in the vicinity of the campus. Therefore, implementing the LRDP at the Davies Campus by 2030 overall is not anticipated to create net new shadows in a manner that would substantially affect the use of any park or open space subject to Section 295, any publicly accessible private open space, any outdoor recreation facility, or any other public area, or that would change the climate in either the community or the region. **This impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the long term.

4.9.6 CUMULATIVE IMPACTS

WIND

The wind tunnel analysis for the proposed Cathedral Hill Campus included an assessment of cumulative wind impacts based on a list of cumulative projects provided by the City (see page 4.1-66 in Section 4.1, "Land Use and Planning"). The results of the cumulative wind tunnel analysis are provided in Table 4.9-3, "Results of the Wind Tunnel Analysis for the Proposed Cathedral Hill Campus—Cumulative Wind Impacts," on page 4.9-60.

As shown in Table 4.9-3, winds would be reduced under project plus cumulative conditions at and in the vicinity of the Cathedral Hill Campus. The average wind speed for all test points would decrease to 9.9 mph. When compared to existing conditions, wind speeds in sidewalk pedestrian areas would decrease from 6–21 mph to 5–17 mph. The cumulative conditions would eliminate seven existing exceedances of the pedestrian-comfort criterion (equivalent wind speed of 11 mph) (locations 3, 4, 8, 10, 16, 22, and 38), while creating no new exceedances. Under the project plus cumulative conditions, nine of the 45 test points would exceed the pedestrian comfort criterion, compared to 16 for existing conditions. Test point 45, on the private rooftop terrace of the adjacent One Daniel Burnham Court building, would continue to meet the pedestrian comfort criterion. Additionally, the wind-hazard criterion (26 mph) would not be exceeded at any of the 45 measurement locations. Accordingly, development under the proposed LRDP would not result in cumulatively considerable wind impacts in the vicinity of the proposed Cathedral Hill Campus.

Table 4.9-3
Results of the Wind Tunnel Analysis for the Proposed Cathedral Hill Campus—Cumulative Wind Impacts

Location	Criterion (mph)	Existing		Project + Cumulative	
		Wind Velocity (mph)	% Time Above Criterion	Wind Velocity (mph)	% Time Above Criterion
1	11	10	–	7	–
2	11	11	–	8	–
3	11	13	15	10	–
4	11	12	13	9	–
5	11	13	16	**12**	**16**
6	11	11	–	10	–
7	11	14	20	**12**	**13**
8	11	12	14	10	–
9	11	9	–	9	–
10	11	12	12	11	–
11	11	11	–	10	–
12	11	8	–	8	–
13	11	9	–	9	–
14	11	11	–	10	–
15	11	13	18	**13**	**18**
16	11	14	20	11	–
17	11	6	–	7	–
18	11	8	–	9	–
19	11	9	–	9	–
20	11	7	–	5	–
21	11	6	–	7	–
22	11	12	13	8	–
23	11	9	–	8	–
24	11	8	–	7	–
25	11	7	–	6	–
26	11	8	–	8	–
27	11	7	–	8	–
28	11	8	–	7	–
29	11	10	–	11	–
30	11	13	18	**13**	**19**
31	11	10	–	10	–
32	11	9	–	10	–

Table 4.9-3
Results of the Wind Tunnel Analysis for the Proposed Cathedral Hill Campus—Cumulative Wind Impacts

Location	Criterion (mph)	Existing		Project + Cumulative	
		Wind Velocity (mph)	% Time Above Criterion	Wind Velocity (mph)	% Time Above Criterion
33	11	9	–	8	–
34	11	9	–	9	–
35	11	10	–	11	–
36	11	10	–	11	–
37	11	21	43	**16**	**32**
38	11	12	13	11	–
39	11	17	31	**13**	**20**
40	11	14	23	**13**	**18**
41	11	10	–	11	–
42	11	7	–	6	–
43	11	17	29	**17**	**33**
44	11	13	17	**16**	**29**
45	11	8	–	7	–
Average	–	10.6	–	9.9	–

Note: mph = miles per hour. Exceedances of the comfort criterion are shown in **bold**.
Source: Ballanti, D. 2009 (September). *Wind Tunnel Analysis for the Proposed California Pacific Medical Center Cathedral Hill Campus Project, San Francisco, California*. El Cerrito, CA. Prepared for AECOM, San Francisco, CA. This document is available for review at the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, as part of Case No. 2005.0555E.

Wind tunnel analyses were not conducted for cumulative impacts on the other CPMC campuses where near- and long-term development is proposed under the LRDP (the Pacific, Davies, and St. Luke's Campuses) because no major large-scale cumulative development is anticipated to occur that would combine with the proposed LRDP at those campuses to create cumulatively considerable adverse wind conditions. As noted in Section 4.1.3, "Cumulative Conditions" (page 4.1-35 of Section 4.1, "Land Use and Planning"), foreseeable projects in the immediate vicinity of the Pacific, Davies, and St. Luke's Campuses are mostly smaller residential and mixed-use projects that are less than six stories tall (up to approximately 75 feet tall or less). No development is proposed for the California Campus under the LRDP; therefore, the CPMC LRDP would not contribute to cumulatively considerable wind conditions at the California Campus vicinity.

The St. Luke's Campus is located in the area covered by the City's *Mission Area Plan*. The adopted Eastern Neighborhoods Rezoning may allow increased development in the future at parcels located immediately adjacent to and north of the St. Luke's Campus. With the proposed height increase for these parcels north of the St. Luke's Campus, wind conditions in the campus area could change if future development projects are proposed on these opportunity sites that meet those increased height allowances. The rezoning is in initial stages and development is currently proposed on those sites near the St. Luke's Campus. Thus, any assumptions about the character of that development that may potentially adversely affect wind conditions in the campus area would be speculative. Should a future development be proposed on those nearby opportunity sites and should the design warrant a wind study, the development would be subject to applicable planning regulations in effect at that time, including possible CEQA environmental review and wind studies. Accordingly, it is unlikely that the LRDP would contribute to a cumulatively considerable impact at the St. Luke's Campus or any other CPMC campus with regard to wind effects; therefore, **cumulative wind impacts would be less than significant**.

SHADOW

Structures more than 40 feet tall could have shadow effects on open space under the jurisdiction of SFRPD. Only the proposed Neuroscience Institute building at the Davies Campus would result in shadows on an SFRPD facility (Duboce Park). Therefore, only shadows created by near-term development at the Davies Campus would have the potential to result in or contribute to a cumulative shadow impact on open space subject to Section 295. As discussed, the proposed (near-term) Neuroscience Institute building at the Davies Campus would create 0.0003% net new shadow on Duboce Park. Although this is a very minor increase in shadow, should other future cumulative development also result in shadows on Duboce Park, the total shadow coverage could cumulatively exceed the net new shadow budget established for that park. However, Section 295 of the Planning Code specifies that such proposed future cumulative development cannot be approved unless the Planning Commission, in consultation with the Recreation and Parks Department, finds that such development would have a less-than-significant effect on the shadows and use of the park. This would avoid significant cumulative shadow effects on open spaces under SFRPD jurisdiction.

As discussed above, none of the near-term developments proposed under the LRDP have the potential to result in net new shadows on any parks, open space, or recreational facilities not subject to Section 295. In addition, long-term development described in this EIR would be subject to additional project-specific environmental review under CEQA after more detailed design information is available, and such development would be required to comply with the City's shadow regulations and requirements at that time. Therefore, the long-term development proposed under the LRDP is not anticipated to create net new shadows in a manner that would substantially affect the use of any parks or open space subject to Section 295, any publicly accessible private open space, any outdoor recreation facility, or any other public area, or that would change the climate in either the community or the region at any of the campuses. Accordingly, **the CPMC LRDP—including near-term, long-term, and combined near- and long-term development—would also not result in a considerable contribution to cumulative shadow impacts on open space**.

Only the proposed Cathedral Hill Hospital and St. Luke's Replacement Hospital would result in shadows on other publicly accessible open space. The Cathedral Hill Hospital would cast shadows on the courtyard proposed for the hospital podium's rooftop throughout the year. The courtyard would experience partial shading during the summertime and during the morning and midday hours of spring. A cumulative impact on this privately owned public accessible open space could occur, should future off-campus cumulative development create net new shadows on the courtyard. However, the courtyard would be located on the roof of the proposed five-story podium. For shadows to reach this location during the spring and summer, new development would need to be located southeast of the site of the proposed Cathedral Hill Hospital. It would be speculative to assume any unknown development in the vicinity; however, all development would be required to undergo shadow analyses as part of compliance with Proposition K.

The St. Luke's Campus is located in the area covered by the City's *Mission Area Plan*. Under the adopted Eastern Neighborhoods Rezoning, increased development may be allowed in the future at parcels located immediately adjacent to and north of the St. Luke's Campus. With the proposed height increase, wind conditions in the area could change if projects are proposed on these opportunity sites that meet these increased height allowances. The rezoning is in the initial stage, and no development is currently proposed on those sites near the St. Luke's Campus. Thus, any assumptions about the character of that development that may potentially adversely affect shadow conditions in the campus area would be speculative. Should a future development be proposed on those nearby sites and should the design warrant a wind study, the development would be subject to applicable planning regulations in effect at that time, including possible CEQA environmental review and shadow analyses.

During the late afternoon hours in spring, the proposed St. Luke's Replacement Hospital would create net new shadows on the entrance plaza that is proposed for that campus under the LRDP. A cumulative impact on this privately owned public open space could occur should future off-campus development create net new shadows on this entrance plaza. However, the proposed campus plaza would be located within the center of the St. Luke's Campus, and the plaza would be surrounded by other existing and proposed structures that already shade this area. Given the distance to off-campus locations where future development could occur (300 feet to the north, 300 feet to the east, 350 feet to the south, and 400 feet to the west), it is unlikely that future development would create additional shadows on that portion of the campus at times when it was not already shaded by on-campus structures. Accordingly, **the CPMC LRDP would not contribute to cumulative shadow impacts on other publicly accessible open space**.

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4.10 RECREATION

This section describes existing recreational parks and open space facilities in the vicinity of the five CPMC project sites. It also discusses the near-term, long-term, and cumulative impacts on local and regional recreational facilities that would result from implementing the proposed CPMC *Long Range Development Plan* (LRDP).

4.10.1 ENVIRONMENTAL SETTING

San Francisco has approximately 5,848 acres of land permanently dedicated to publicly accessible park and recreational uses. These lands are under the jurisdiction of the San Francisco Recreation & Park Department (SFRPD), the State of California, the National Park Service, and local agencies.[1] SFRPD owns and manages approximately 3,433 acres of that total, including more than 200 parks, playgrounds, and open spaces. Recreational facilities in SFRPD's system also include 15 recreation centers, nine swimming pools, five golf courses, and more than 300 athletic fields, tennis courts, baseball diamonds, and basketball courts.[2, 3] The State of California owns approximately 255 acres at Candlestick Point State Recreation Area and Mount Sutro, and the federal government owns approximately 1,600 acres, including portions of the Presidio and the Golden Gate National Recreation Area, managed by the National Park Service.[4, 5] The remaining 560 acres of publicly accessible lands are under the jurisdiction of local agencies other than SFRPD (e.g., Port of San Francisco, San Francisco Public Utilities Commission, San Francisco Redevelopment Agency, San Francisco Department of Public Works (DPW) and the San Francisco Unified School District [SFUSD]). These spaces include shoreline access, reservoirs, schoolyards, streets, alleys, and undeveloped street rights-of-way.[6]

Publicly accessible open spaces and recreational facilities are categorized by size and amenities to serve the city, district, neighborhood, or subneighborhood. Citywide open spaces vary from small to large parks, such as Golden Gate Park; unlike neighborhood facilities, these spaces attract residents from throughout San Francisco and beyond. District-serving, neighborhood-serving, and subneighborhood-serving facilities are used primarily by residents in the immediate area and are categorized by size and service area. As shown in Figure 4.10-1, "Overview of Parks and Open Spaces within One-Half Mile of All CPMC Campuses" (page 4.10-2), the existing CPMC campuses are accessible to a variety of city-, district-, neighborhood-, and subneighborhood-serving parklands. See page 3-6 of Chapter 3, "Plans and Policies," and the Recreation and Open Space Element of the *San Francisco General Plan* (General Plan) for details on these categories of parks and open spaces.[7]

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[1] Exline, Sue. Citywide Policy Planner. San Francisco Planning Department. San Francisco, CA. February 23, 2010—telephone conversation with Stephanie Klock of AECOM regarding SFRPD lands.
[2] San Francisco Planning Department. 1986. *San Francisco General Plan*, Recreation and Open Space Element. San Francisco, CA.
[3] Exline, Sue. Citywide Policy Planner. San Francisco Planning Department. San Francisco, CA. February 23, 2010—telephone conversation with Stephanie Klock of AECOM regarding SFRPD lands.
[4] Ibid.
[5] San Francisco Planning Department. 2008. *San Francisco General Hospital Seismic Compliance Hospital Replacement Program Final Environmental Impact Report,* Volume I. San Francisco, CA. Page 302.
[6] Exline, Sue. Citywide Policy Planner. San Francisco Planning Department. San Francisco, CA. February 23, 2010—personal communication by telephone with Stephanie Klock of AECOM regarding SFRPD lands.
[7] San Francisco Planning Department. 1986. *San Francisco General Plan*, Recreation and Open Space Element, San Francisco, CA.

Source: Data compiled by AECOM in 2009 based on San Francisco Enterprise GIS Program data

Parks and Open Spaces within One-Half Mile of All CPMC Campuses **Figure 4.10-1**

The National Park and Recreation Association (NPRA) formerly required 10 acres of open space per 1,000 city residents. However, the NPRA no longer recommends a single absolute "average" park acreage per population, in recognition of the fact it is more relevant for each area plan and its program facilities to be based on community need. More important than acreage is accessibility (location and walking distance) and whether the facility provides needed services to the population in question.[8]

Based on San Francisco's estimated 2008 household population (824,525 persons)[9], the 5,848 acres of parkland result in approximately 7.1 acres per 1,000 residents, somewhat less than the former NPRA standard. The City and County of San Francisco (City) has not established a citywide target ratio of parkland to residents, nor has it adopted a Quimby Act ordinance requiring land dedications or in-lieu fees, because San Francisco's population density, small land mass, and other development constraints make such policies infeasible.[10] The General Plan's Recreation and Open Space Element (1986) states that "to the extent it reasonably can, the City should increase the per capita supply of public open space within the City" from the parkland-population ratio at the time of the General Plan's adoption (1986), which is 5.5 acres per 1,000 residents. Therefore, the General Plan's benchmark of 5.5 acres per 1,000 residents is currently more than met under existing conditions (currently 7.1 acres per 1,000 residents).

However, revisions to the Recreation and Open Space Element (May 2009 draft) do not state a baseline standard to be maintained. The focus of the updated Recreation and Open Space Element is on developing existing open space into high-performing open spaces that better serve neighborhood residents, improving access to open space, and prioritizing open space acquisitions and improvements in high-need areas.[11] Because there is no threshold criterion, this analysis uses the 5.5 ratio as a guideline for informational purposes only. A ratio of 5.5 acres of parkland per 1,000 population is sufficient to meet demand for recreational facilities without causing or accelerating substantial physical deterioration of facilities or requiring the construction of additional facilities.

Although San Francisco's ratio of parkland to residents is less than the NPRA standard (which, as stated above, formerly required 10 acres of open space per 1,000 residents), San Franciscans benefit from the Bay Area's regional open space system. The regional system includes nearby public open space managed by the East Bay

[8] San Francisco Planning Department. 2008 (August 7). *Eastern Neighborhoods Rezoning and Area Plans Environmental Impact Report.* Planning Department Case No. 2004.0160E. State Clearinghouse No. 2005032048. San Francisco, CA. Page 372.

[9] California Department of Finance. 2008 (January). Table 2, "E-5 City/County Population and Housing Estimates, 1/1/2008." Sacramento, CA.

[10] San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Page III.P-1-2.

[11] Exline, Sue. Citywide Policy Planner. San Francisco Planning Department. San Francisco, CA. June 23, 2010—email message to Stephanie Klock of AECOM regarding parkland to population ratio.

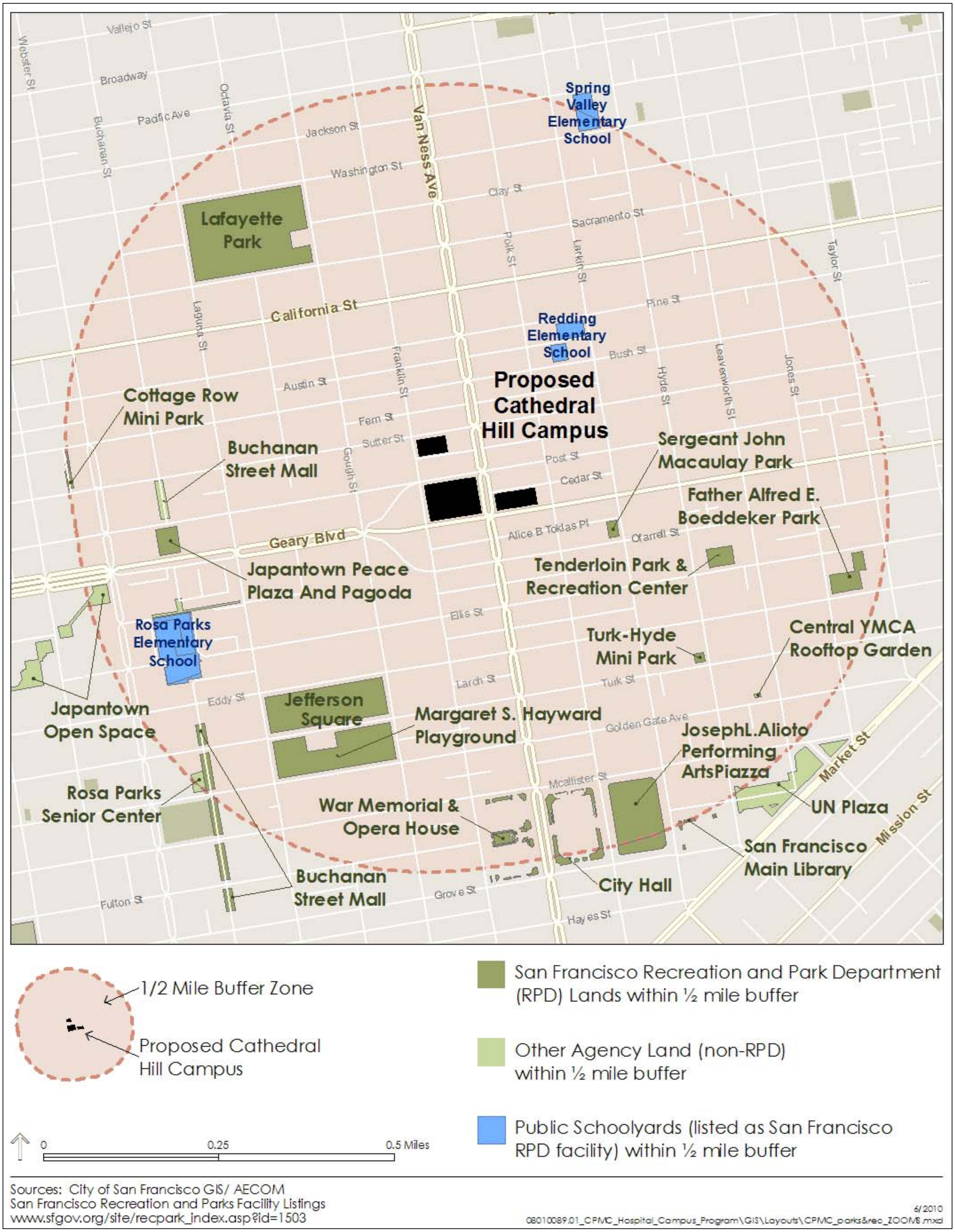
Regional Park District in Alameda and Contra Costa Counties and by the National Park Service in Marin, San Francisco, and San Mateo Counties, as well as state park and recreation areas throughout the region.[12]

The majority of San Francisco's parkland is located within the western half of the city. San Francisco's eastern neighborhoods are considered parkland deficient compared to areas that are closer to the Pacific Ocean. The *Eastern Neighborhoods Rezoning and Area Plans Environmental Impact Report* indicates that it is possible to improve the parkland-to-population ratio in the eastern portions of San Francisco—or to maintain the current ratio despite projected population increases—by creating nontraditional open space, passing regulatory amendments to govern new development, issuing ecological standards for design of public and private open space, and creating an open space network.[13]

The General Plan establishes a goal of serving every neighborhood with adequate public open space and recreational facilities. The General Plan's Recreation and Open Space Element states that access is a key factor in park use and that "every San Franciscan should be served by a park within walking distance of their home."[14]

Recreational resources within one-half mile of each CPMC campus are discussed below. A one-half-mile radius to recreational resources was defined because the General Plan specifies that this is an acceptable walking distance (an approximately 10-minute walk) for city-serving open spaces.[15] Figures 4.10-2, 4.10-3, 4.10-4, 4.10-5, and 4.10-6 (presented on pages 4.10-5, 4.10-10, 4.10-14, 4.10-18, and 4.10-23, respectively) are a series of maps that correspond to each CPMC campus site, representing a more detailed perspective of parks and open space within the one-half-mile vicinity.

12 San Francisco Planning Department. 2008 (August 7). *Eastern Neighborhoods Rezoning and Area Plans Environmental Impact Report.* Planning Department Case No. 2004.0160E. State Clearinghouse No. 2005032048. San Francisco, CA.
13 Ibid.
14 San Francisco Planning Department. 1986. *San Francisco General Plan*, Recreation and Open Space Element. San Francisco, CA.
15 Ibid.



Source: Data compiled by AECOM in 2009 based on San Francisco Enterprise GIS Program data

Parks and Open Spaces within One-Half Mile of the Proposed Cathedral Hill Campus — Figure 4.10-2

Table 4.10-1
Parks and Related Facilities within One-Half Mile of the Proposed Cathedral Hill Campus

Facility	Park Acres	Acres within One-Half Mile
Facilities Operated by SFRPD		
Buchanan Street Mall	1.81	0.68
City Hall	0.81	0.50
Cottage Row Mini Park	0.13	0.13
Father Alfred E. Boeddeker Park	0.97	0.97
Japantown Peace Plaza and Pagoda	0.71	0.71
Jefferson Square	5.64	5.64
Joseph L. Alioto Performing Arts Piazza (Civic Center Plaza)	4.43	3.65
Lafayette Park	11.49	11.49
Margaret S. Hayward Playground	5.02	5.02
San Francisco Main Library	< 0.1	< 0.1
Sgt. John Macaulay Park	0.21	0.21
Tenderloin Park and Recreation Center	0.61	0.61
Turk & Hyde Mini Park	0.11	0.11
War Memorial & Opera House	0.76	0.65
Non-SFRPD Facilities		
Buchanan Street Mall (public open space associated with shopping center)	0.42	0.42
Central YMCA Rooftop Garden	< 0.1	< 0.1
UN Plaza	3.03	< 0.1
Japantown Open Space	0.74	0.74
Rosa Parks Senior Center	0.29	0.20
Public Schoolyards		
Redding Elementary School	0.85	0.85
Rosa Parks Elementary School	3.24	3.24
Spring Valley Elementary School	0.94	0.43
TOTAL	**42.21**	**36.25**

Notes: SFRPD = San Francisco Recreation & Park Department. Non-SFRPD lands refer to land owned by other agencies such as the Golden Gate National Recreation Area, State of California, San Francisco Department of Public Works, San Francisco Redevelopment Agency, San Francisco Water Department, Port of San Francisco, San Francisco Municipal Railway, and private entities. Schoolyards listed include those affiliated with SFRPD. Acreage totals do not include parks with less than 0.1 acre.
Source: Data compiled by AECOM in 2010 based on GIS data provided by San Francisco Planning Department.

CATHEDRAL HILL CAMPUS

Nearby Parks and Open Space Facilities

As shown in Figure 4.10-2 (page 4.10-5) and listed in Table 4.10-1, "Parks and Related Facilities within One-Half Mile of the Proposed Cathedral Hill Campus," 14 SFRPD facilities, five non-SFPRD facilities, and three schoolyards are located within one-half mile of the location of the proposed Cathedral Hill Campus.

As shown in Figure 4.10-2, the Buchanan Street Mall, located eight blocks southwest of the proposed campus on Buchanan Street between Grove and Turk Streets, is a pedestrian mall that spans roughly 1.8 acres and houses shops, restaurants, and a small park. The park consists of tennis courts, play structures, and a playground.[16] Situated within the Cottage Row Historic District, the Cottage Row Mini Park is a 0.13-acre green space located at Sutter and Fillmore Streets, approximately eight blocks west of the proposed Cathedral Hill Campus. This park complements an adjacent row of Victorian cottages and consists of a landscaped promenade suitable for leisurely walks.[17] Father Alfred E. Boeddeker Park, also known as Boeddeker Park (0.97 acre), offers a playground and clubhouse and is located at Eddy and Jones Streets, seven blocks southeast of the proposed Cathedral Hill Campus.[18] The Japantown Peace Plaza and Pagoda (0.71 acre) is a civic plaza located four blocks west of the site of the proposed Cathedral Hill Campus at Post and Buchanan Streets. The plaza includes the five-story Peace Pagoda with traditional Japanese gardens and can be used for formal events.[19] Jefferson Square (5.6 acres) and Margaret Hayward Playground (5.0 acres) are located across the street from one another on Turk and Gough Streets, approximately four blocks southwest of the proposed Cathedral Hill Campus. Jefferson Square is a green space situated on a hill that offers city views and is used for dog-walking,[20] while the Margaret Hayward Playground consists of tennis courts, a playground, playing fields (James Lang Field), basketball courts, and passive recreational space.[21]

The Joseph L. Alioto Performing Arts Piazza (formally called Civic Center Plaza) is located 12 blocks south of the project site at Larkin and Grove Streets. This 4.4-acre park serves as a gathering area and includes a small, fenced playground with climbing structures and water fountains.[22] Lafayette Park (approximately 11.5 acres) is

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[16] Neighborhood Parks Council. 2009. ParkScan San Francisco: Buchanan Street Mall. Available: http://www.parkscan.org/parks?parkId=78. Accessed June 2009.

[17] Neighborhood Parks Council. 2010. ParkScan San Francisco: Cottage Row Mini Park. Available: http://www.parkscan.org/parks?parkId=65. Accessed February 2010.

[18] Neighborhood Parks Council. 2004 (Summer). Father Alfred Boeddeker Park. Neighborhood Park Report #35, Summer 2004. Available: http://www.sfnpc.org/pdf/publications/Newsletter35.pdf. Accessed October 2009.

[19] San Francisco Recreation & Park Department. 2009. Parks Bike Day 7 Blog. Available: http://www.sfgov.org/site/recpark_index.asp?id=93116. Accessed June 2009.

[20] Neighborhood Parks Council. 2009. Park Kiosk: Jefferson Square Park. Available: http://www.sfnpc.org/parkkiosk/jeffersonsquare. Accessed June 2009.

[21] Neighborhood Parks Council. 2009. ParkScan San Francisco: Margaret S. Hayward Playground. Available: http://www.parkscan.org/parks?parkId=88. Accessed June 2009.

[22] Neighborhood Parks Council. 2009. ParkScan San Francisco: Civic Center Plaza. Available: http://www.parkscan.org/parks?parkId=83. Accessed June 2009.

located seven blocks north of the proposed campus at Washington and Laguna Streets. With two tennis courts, a running path, a children's play area, and a sprawling lawn, Lafayette Park provides facilities for both active and passive recreational pursuits.[23] Sergeant John Macaulay Park is the nearest park to the Cathedral Hill site located approximately two blocks southeast on O'Farrell and Larkin Streets. This 0.2-acre mini park was recently renovated and includes a playground with a climbing structure.[24] Sergeant John Macaulay Park is not open to adults unless accompanied by children under 12 years of age.[25] The 0.6-acre Tenderloin Park and Recreation Center, located four blocks southeast on Ellis Street between Leavenworth and Hyde Streets, consists of a small playground, a multipurpose court, and a recreation center.[26] The Turk and Hyde Mini Park is a 0.11-acre street-corner playground at Turk and Hyde Streets that features a tire swing and a large play structure.[27]

City Hall, the San Francisco Main Library, and the War Memorial and Opera House—all operated by SFRPD—and their surrounding lands provide open space for the community. These three facilities are located approximately 12 blocks south of the proposed Cathedral Hill Campus. The five non-SFRPD facilities are the Buchanan Street Mall open space, the Central YMCA Rooftop Garden, UN Plaza, Japantown Open Space, and the Rosa Parks Senior Center. A small stretch of open space (0.42 acre) is associated with the Buchanan Street Mall, located on Buchanan Street between Sutter and Post Streets, approximately three blocks west of the site. The Central YMCA Rooftop Garden is owned by the YMCA and is located approximately 11 blocks from the proposed Cathedral Hill Campus.[28] The UN Plaza, located along Market Street, is situated just within the half-mile radius and consists of a public plaza with fountains and trees that house the Orpheum Theater and the Art Institute of California. The Japantown open space, located approximately five blocks west of the site, includes a privately owned diagonal walkway connecting Webster Street to Fillmore Street along the northern edge of the Safeway parking lot.[29] A small playground at the Rosa Parks Senior Center, located at 1111 Buchanan Street, is approximately nine blocks to the southwest.[30]

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[23] Neighborhood Parks Council. 2010. ParkScan San Francisco: Lafayette Park. Available: http://www.parkscan.org/parks?parkId=24. Accessed February 2010.

[24] Neighborhood Parks Council. 2009. ParkScan San Francisco: Sgt. John Macauley Park. Available: http://www.parkscan.org/parks?parkId=90. Accessed June 2009.

[25] Zoellner, T. 2000. Once-Squalid S.F. Park Spiffed Up/Haven for kids opens in Tenderloin. *San Francisco Chronicle*, October 25, 2000. Available: http://articles.sfgate.com/2000-10-25/news/17663749_1_tenderloin-children-s-center-city-officials. Accessed February 2010.

[26] Neighborhood Parks Council. 2009. ParkScan San Francisco: Tenderloin Park and Rec. Center. Available: http://www.parkscan.org/parks?parkId=94. Accessed June 2009.

[27] Neighborhood Parks Council. 2009. ParkScan San Francisco: Hyde Turk Mini Park. Available: http://www.parkscan.org/parks?parkId=86. Accessed November 2009.

[28] The YMCA is in the process of moving to its new location at 387 Golden Gate Avenue.

[29] San Francisco Planning Department. 2009. *Draft Japantown Better Neighborhood Plan*. Chapter 6, "Public Realm," page 85.

[30] Neighborhood Parks Council. 2009. ParkScan San Francisco: Rosa Parks Senior Center. Available: http://www.parkscan.org/parks?parkId=79. Accessed December 2009.

In addition to the parks and recreational facilities mentioned above, SFRPD-affiliated school yards are located at Redding Elementary School (1421 Pine Street) and Spring Valley Elementary School (1451 Jackson Street).[31] Rosa Parks Elementary School, located at 1501 O'Farrell Street, is also open on the weekends for the community's use.[32]

Recreational Resources at the Proposed Cathedral Hill Campus

The site of the proposed Cathedral Hill Hospital (currently the Cathedral Hill Hotel and 1255 Post Street Office Building) has a pool and patio area with landscaping and trees within a courtyard area on the hotel's fourth-floor rooftop. This area is owned by the Cathedral Hill Hotel and accessible only to hotel guests.[33] Refer to Figure 2-3, "Cathedral Hill Campus—Existing Site Plan," on page 2-51 of this EIR for more information regarding on-site parks and open space areas.

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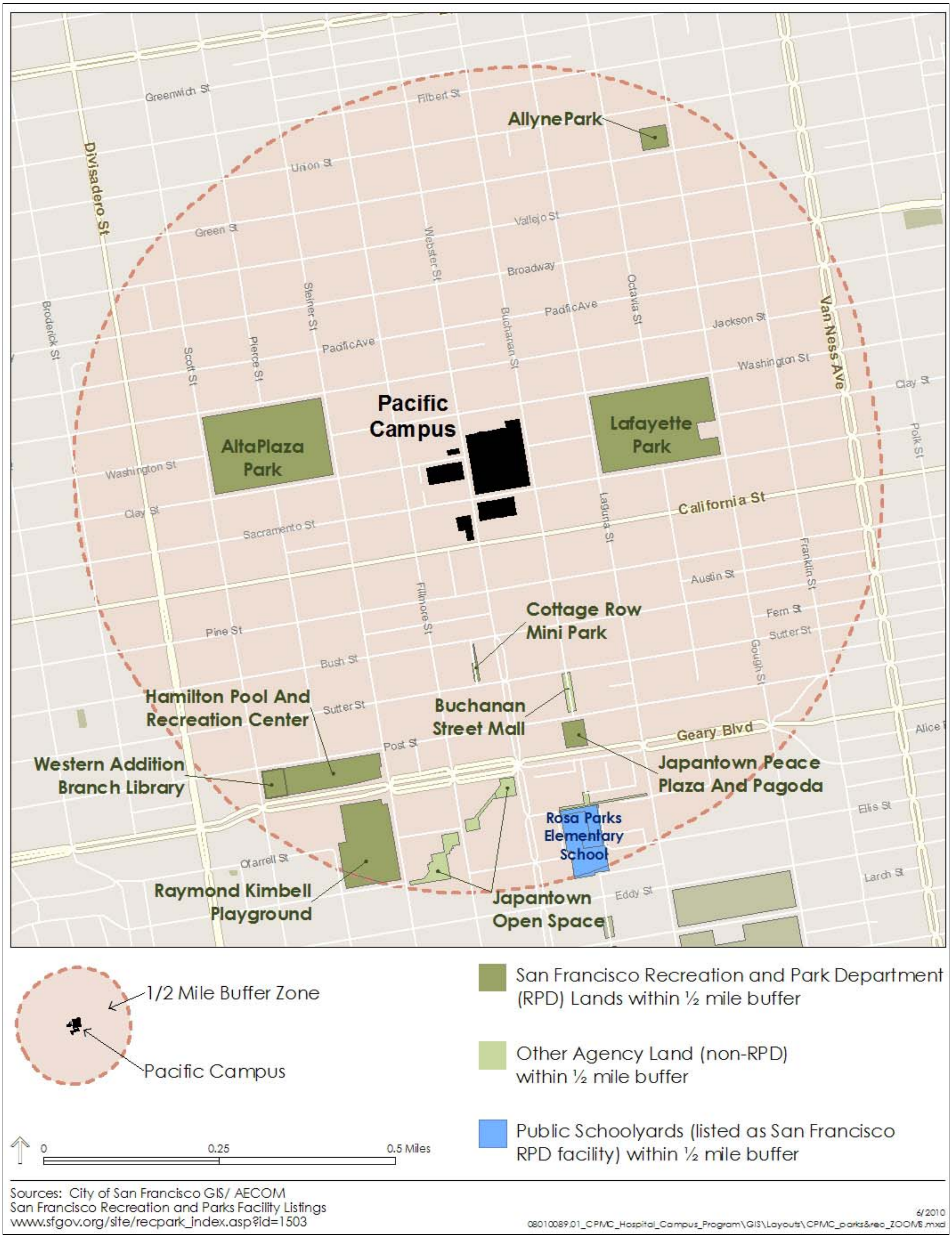
[31] San Francisco Recreation & Park Department. 2009. Facility Listings. Available: http://ci.sf.ca.us/site/recpark_index.asp?id=1503. Accessed December 2009.

[32] Armentrout, Chris. Director of development and local government relations. San Francisco Unified School District, San Francisco, CA. March 16, 2010—telephone conversation with Heather Kyi of AECOM regarding schoolyards that are open to the public.

[33] The Cathedral Hill Hotel and 1255 Post Street ceased operation on October 31, 2009.



Source: Data compiled by AECOM in 2009 based on San Francisco Enterprise GIS Program data

Parks and Open Spaces within One-Half Mile of the Pacific Campus **Figure 4.10-3**

Table 4.10-2
Parks and Related Facilities within One-Half Mile of the Pacific Campus

Facility	Park Acres	Acres within One-Half Mile
Facilities Operated by SFRPD		
Allyne Park	0.75	0.75
Alta Plaza Park	11.90	11.90
Cottage Row Mini Park	0.16	0.16
Hamilton Pool and Recreation Center	3.22	3.22
Japantown Peace Plaza and Pagoda	0.71	0.71
Lafayette Park	11.49	11.49
Raymond Kimbell Playground	5.42	5.01
Western Addition Branch Library	0.75	0.75
Non-SFRPD Facilities		
Buchanan Street Mall (public open space associated with shopping center)	0.42	0.42
Japantown Open Space	2.14	2.14
Public Schoolyards		
Rosa Parks Elementary School	3.10	3.10
TOTAL	**40.06**	**39.65**

Notes: SFRPD = San Francisco Recreation & Park Department. Non-SFRPD lands refer to land owned by other agencies such as the Golden Gate National Recreation Area, State of California, San Francisco Department of Public Works, San Francisco Redevelopment Agency, San Francisco Water Department, Port of San Francisco, San Francisco Municipal Railway, and private entities. Schoolyards listed include those affiliated with SFRPD. Acreage totals do not include parks with less than 0.1 acre.
Source: Data compiled by AECOM in 2010 based on GIS data provided by San Francisco Planning Department.

PACIFIC CAMPUS

Nearby Parks and Open Space Facilities

As shown in Figure 4.10-3 (page 4.10-10) and listed in Table 4.10-2, "Parks and Related Facilities within One-Half Mile of the Proposed Pacific Campus," eight SFRPD properties, two non-SFRPD properties, and one schoolyard are located within one-half mile of the Pacific Campus.

Because the Pacific Campus is relatively close to the proposed Cathedral Hill Campus, six facilities are located within a one-half-mile radius of both campuses: Lafayette Park (located one block east of the Pacific Campus), the Japantown Peace Plaza (four blocks south), Cottage Row Mini Park (three blocks south), Buchanan Street Mall open space (three blocks south), and Japantown open space (six blocks south). Rosa Parks Elementary School is also within the half-mile vicinity of the Pacific Campus. Please refer to the discussion above under "Cathedral Hill Campus" for information about these facilities.

Allyne Park, located on the corner of Gough and Green Streets, is a 0.75-acre mini park situated approximately eight blocks northeast of the Pacific Campus. This fenced-in park is a dog park and offers landscaped paths with public seating.[34] Alta Plaza Park is an approximately 11.9-acre park located two blocks west of the Pacific Campus on Steiner Street between Jackson and Clay Streets. Alta Plaza Park, known for its hills and numerous trees, consists of a playground, tennis courts, an off-leash dog area, paved walking trails, and a multipurpose/basketball court.[35]

The Hamilton Pool and Recreation Center and the Raymond Kimbell Playground are located across the street from one another on Geary Boulevard, approximately six blocks southwest of the Pacific Campus. The Hamilton Pool and Recreation Center (3.22 acres) is located at Geary Boulevard and Steiner Street and includes an indoor swimming pool, playing fields, playgrounds, a recreation center/gym with activity rooms, and an auditorium with a stage.[36, 37] The Raymond Kimbell Playground (5.42 acres) at Steiner and Geary Streets is a large playground with green space areas, ball fields, a gym, pool, and sand play area with climbing structures.[38] The Western

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[34] Neighborhood Parks Council. 2010. ParkScan San Francisco: Allyne Park. Available: http://www.parkscan.org/parks?parkId=16. Accessed February 2010.

[35] Neighborhood Parks Council. 2010. ParkScan San Francisco: Alta Plaza Park. Available: http://www.parkscan.org/parks?parkId=17 Accessed February 2010.

[36] SF Kids. 2009. Hamilton Recreation Center. Available: http://www.sfkids.org/Content.aspx?id=8514. Accessed June 2009.

[37] The Hamilton Recreation Center and pool are under renovation from December 2007 through August 2009. Anticipated opening is late 2009. (See SF Kids 2009.)

[38] Kids Play Parks. 2010. Raymond Kimball Playground. Available: http://www.kidsplayparks.com/Location.aspx?LocationID=52942. Accessed February 2010.

Addition Branch Library, located adjacent to the Hamilton Pool and Recreation Center, sits on a 0.75-acre site consisting of a library, a landscaped courtyard, and green space surrounding it.[39]

Recreational Resources at the Pacific Campus

Four open space areas and a garden are located within the Pacific Campus. An open space corridor is located between the Gerbode Research Building (2200 Webster Street) and the Annex Medical Office Building (MOB) (2340–2360 Clay Street). This space is used to store landscaping equipment and is not open to the public.[40] A second open space is adjacent to the north side of the Stern Building (2330 Clay Street) and contains a publicly accessible walkway on the northeast side of the building. This walkway can be accessed from the Clay Street steps or via a small stairway from the surface parking on Buchanan Street.[41] A smaller strip of open space is located near the intersection of Buchanan and Washington Streets, adjacent to the north end of the parking lot. A gated open space area separates the Pacific Professional Building (2100 Webster Street) from the Stanford Building (2351 Clay Street). A community garden affiliated with the Institute for Health and Healing is situated between the Health Sciences Library (2395 Sacramento Street) and the currently vacant residential/commercial building at 2018 Webster Street. The garden is open to the public 5 days a week between 8:30 a.m. and 5 p.m. and can be accessed from Webster Street through a gate. The garden is not used for any classes by the Institute of Health and Healing and the grounds are maintained by CPMC staff.[42] A private child-care center with an outdoor play area is also located directly east of the Health Sciences Library and garden.[43] Refer to Figure 2-39, "Pacific Campus—Existing Site Plan," on page 2-121 of this EIR for more information regarding on-site parks and open space areas.

[39] San Francisco Public Library. 2010. Western Addition Library History. Available: http://www.sfpl.org/index.php?pg=2000084401. Accessed April 14, 2010.

[40] Massehian, Vahram. Senior project manager. Sutter Health. San Francisco, CA. May 27, 2010—e-mail message to Stephanie Klock of AECOM regarding open spaces at the Pacific Campus.

[41] Ibid.

[42] Massehian, Vahram. Senior project manager. Sutter Health. San Francisco, CA. April 7, 2010—telephone call with Stephanie Klock of AECOM regarding the garden facility.

[43] CPMC owned the land and leases the space to the private child care center.

Source: Data compiled by AECOM in 2009 based on San Francisco Enterprise GIS Program data

Parks and Open Spaces within One-Half Mile of the California Campus **Figure 4.10-4**

Table 4.10-3
Parks and Related Facilities within One-Half Mile of the California Campus

Facility	Park Acres	Acres within One-Half Mile
Facilities Operated by SFRPD		
Angelo J. Rossi Playground	6.47	3.30
Julius Kahn Playground	12.37	12.37
Laurel Hill Playground	1.47	1.47
Mountain Lake Park	12.78	1.96
Presidio Heights Playground	0.44	0.44
Non-SFRPD Facilities		
The Presidio	1,488.96	135.30
University of San Francisco	22.95	8.88
Public Schoolyards		
George Peabody School (Elementary)	0.82	0.82
Roosevelt Middle High School	2.18	2.18
TOTAL	**1,548.44**	**166.72**

Notes: SFRPD = San Francisco Recreation & Park Department. Non-SFRPD lands refer to land owned by other agencies such as the Golden Gate National Recreation Area, State of California, San Francisco Department of Public Works, San Francisco Redevelopment Agency, San Francisco Water Department, Port of San Francisco, San Francisco Municipal Railway, and private entities. Schoolyards listed include those affiliated with SFRPD. Acreage totals do not include parks with less than 0.1 acre.
Source: Data compiled by AECOM in 2010 based on GIS data provided by San Francisco Planning Department.

California Campus

Nearby Parks and Open Space Facilities

As shown in Figure 4.10-4 (page 4.10-14) and listed in Table 4.10-3, “Parks and Related Facilities within One-Half Mile of the California Campus,” SFRPD properties within one-half mile of the California Campus consist of four playgrounds and a portion of the 13-acre Mountain Lake Park. Non-SFRPD facilities include the Presidio and some open space associated with the University of San Francisco (USF). The Roosevelt Gym and the George Peabody Schoolyard are also located within a half-mile vicinity of the site.

The 6.5-acre Angelo J. Rossi Playground is located three blocks south of the California Campus at Arguello Boulevard and Anza Street and includes two baseball fields, a large grass area, three tennis courts, basketball court, an indoor swimming pool, and a play area for children.[44] The Julius Kahn Playground, approximately 12.4 acres in size, is located four blocks north of the California Campus on the Presidio’s southern border, along West Pacific Avenue between the Arguello and Presidio Gates. This playground consists of basketball and tennis courts, soccer and baseball fields, and two playgrounds with swings and sandboxes.[45] Although this playground is located within the Presidio’s boundaries, the City operates the playground.[46] Laurel Hill Playground (1.5 acres), which consists of a sand play area, tennis court, small ball field, basketball court, and recreation center, is located approximately four blocks southeast of the campus site at Euclid and Blake Streets.[47] A portion of the 13-acre Mountain Lake Park is situated seven blocks west of the California Campus on Lake Street between Funston Avenue and 12th Avenue. Mountain Lake Park includes a dog run at the eastern end of the park, tennis and basketball courts, jogging trails and bike paths, a multilevel playground, a built-in fitness circuit, a lake with a small beach area, and a covered picnic pavilion.[48] The Presidio Heights Playground, a 0.44-acre site consisting of a basketball court, a sport court, playground, climbing structures, and clubhouse, is located approximately three blocks east of the California Campus on Clay Street at Walnut and Laurel Streets.[49]

The two non-SFRPD facilities include the Presidio and the USF campus. The Presidio is located approximately four blocks north of the California Campus and includes approximately 1,490 acres of open shore, wild coastal bluffs, wooded hilltops, and gardens as well as historic structures that make the park a National Historic Landmark District. The Presidio Trust manages the interior 80% of Presidio lands, including most buildings and

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[44] Neighborhood Parks Council. 2009. ParkScan San Francisco: Rossi (Angelo J.) Playground. Available: http://www.parkscan.org/parks?parkId=15. Accessed June 2009.

[45] Neighborhood Parks Council. 2010. ParkScan San Francisco: Julius Kahn Playground. Available: http://www.parkscan.org/parks?parkId=23. Accessed February 2010.

[46] The Presidio Trust. 2009. Playgrounds: Julius Kahn Playground. Available: http://www.presidio.gov/kids/playgrounds/. Accessed June 2009.

[47] Parents Connect Local. 2009. Laurel Hill Playground in San Francisco, CA 94118. Available: http://gocitykids.parentsconnect.com/attraction/laurel-hill-playground-euclid-san-francisco-ca-94118-us. Accessed June 2009.

[48] Neighborhood Parks Council. 2009. ParkScan San Francisco: Mountain Lake Park. Available: http://www.parkscan.org/parks?parkId=26. Accessed June 2009.

[49] Neighborhood Parks Council. 2010. ParkScan San Francisco: Presidio Heights Playground. Available: http://www.parkscan.org/parks?parkId=28. Accessed February 2010.

infrastructure, while the National Park Service manages coastal areas.[50] Some of the most popular recreation destinations within the Presidio include the Main Post, Crissy Field, the Letterman District, and Baker Beach.[51] USF is located approximately three blocks south of the California Campus and has approximately 23 acres of non-SFRPD land.

The SFRPD-affiliated schools include the Roosevelt Gym, located at the Roosevelt Middle High School at 460 Arguello Boulevard (approximately two blocks south of the campus) and the George Peabody Schoolyard, located at 251 6th Avenue (approximately six blocks southwest of the campus).[52]

Recreational Resources at the California Campus

There are two open space areas at the California Campus. One open space area is situated at the corner of Cherry and Sacramento Streets, north of the ambulance entrance. This area is publicly accessible consisting of several trees and a small walking path. A separate gated open space area adjoins the East Campus Hospital (3698 California Street/3773 Sacramento Street) to the north and includes circular walking paths and potted plants. Refer to Figure 2-42, "California Campus—Existing Site Plan," on page 2-135 of this EIR for more information regarding on-site parks and open space areas.

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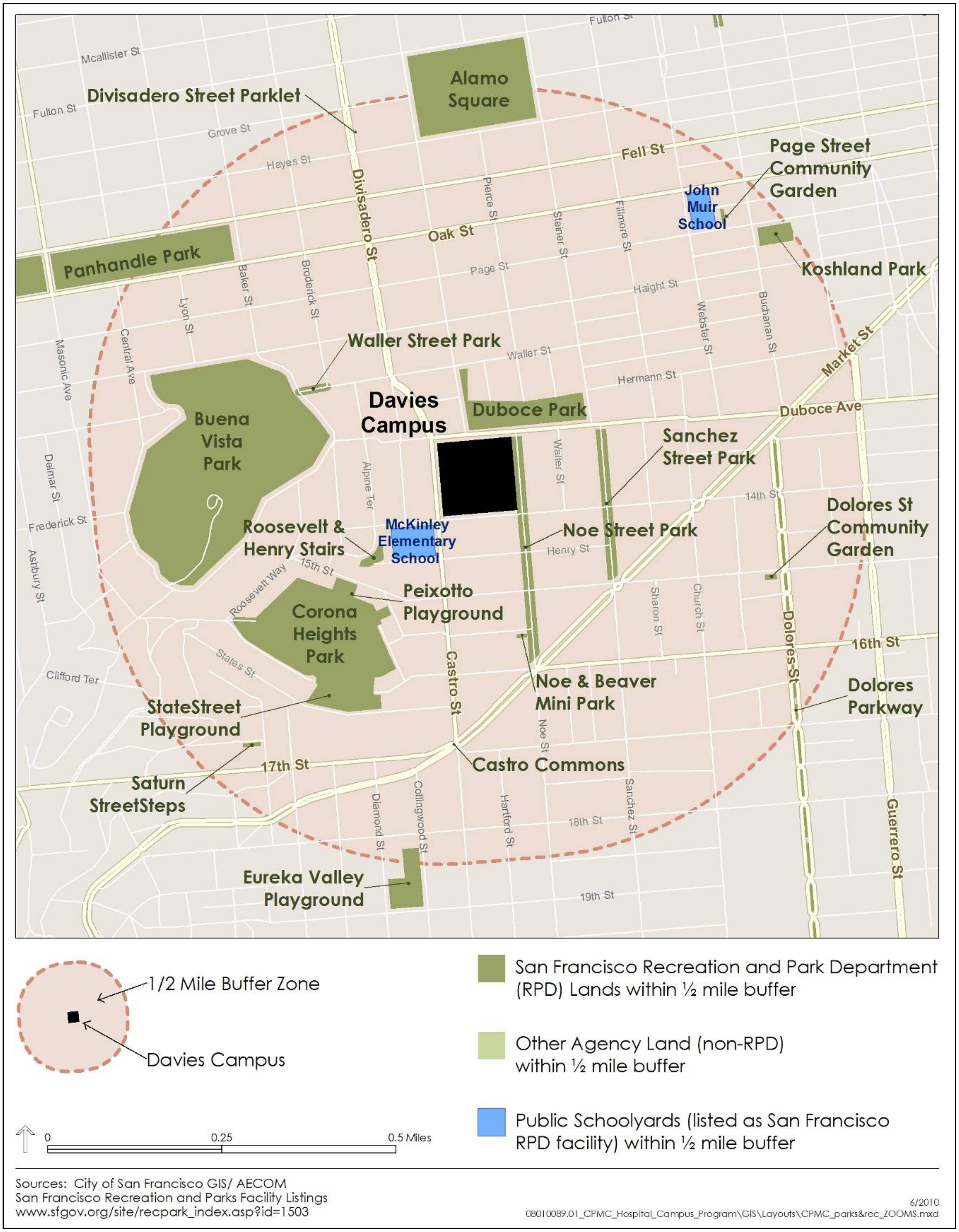
[50] The Presidio Trust. 2010. Mission and History. Available: http://www.presidio.gov/trust/. Accessed April 2010.

[51] The Presidio Trust. 2010. Park Preview. Available: http://www.presidio.gov/experiences/preview.htm. Accessed April 2010

[52] San Francisco Recreation & Park Department. 2009. Facility Listings. Available: http://ci.sf.ca.us/site/recpark_index.asp?id=1503. Accessed December 2009.



Source: Data compiled by AECOM in 2009 based on San Francisco Enterprise GIS Program data

Parks and Open Spaces within One-Half Mile of the Davies Campus **Figure 4.10-5**

Table 4.10-4
Parks and Related Facilities within One-Half Mile of the Davies Campus

Facility	Park Acres	Acres within One-Half Mile
Facilities Operated by SFRPD		
Alamo Square	12.69	5.67
Buena Vista Park	36.05	36.05
Corona Heights Park (including Peixotto Playground & States Street Playground)	16.78	16.78
Duboce Park	4.31	4.31
Eureka Valley Playground (also known as Collingwood Park)	1.93	0.31
Koshland Park	0.82	0.78
Panhandle Park	24	4.28
Noe & Beaver Mini Park	< 0.1	< 0.1
Page Street Community Garden	< 0.1	< 0.1
Roosevelt & Henry Stairs	0.34	0.34
Saturn Street Steps	0.10	0.10
Non-SFRPD Facilities		
Castro Commons	< 0.1	< 0.1
Divisadero Street Parklet	< 0.1	< 0.1
Dolores Parkway	0.78	0.78
Dolores Street Community Garden	< 0.1	< 0.1
Noe Street Park	0.36	0.36
Sanchez Street Park	3.11	3.11
Waller Street Park	2.09	2.09
Public Schoolyards		
John Muir Elementary School	1.05	1.05
McKinley Elementary School	1.69	1.69
TOTAL	**106.1**	**77.7**

Notes: SFRPD = San Francisco Recreation & Park Department. Non-SFRPD lands refer to land owned by other agencies such as the Golden Gate National Recreation Area, State of California, San Francisco Department of Public Works, San Francisco Redevelopment Agency, San Francisco Water Department, Port of San Francisco, San Francisco Municipal Railway, and private entities. Schoolyards listed include those affiliated with SFRPD. Acreage totals do not include parks with less than 0.1 acre.
Source: Data compiled by AECOM in 2010 based on GIS data provided by San Francisco Planning Department.

DAVIES CAMPUS

Nearby Parks and Open Space Facilities

As shown in Figure 4.10-5 (page 4.10-18) and listed in Table 4.10-4, "Parks and Open Spaces within One-Half Mile of the Davies Campus," SFRPD properties within one-half mile of the Davies Campus consist of 12 parks, open space areas, plazas, playgrounds, and community gardens, as well as a portion of Golden Gate Park known as Panhandle Park. Several non-SFRPD properties and John Muir Schoolyard are also located nearby.

Alamo Square Park is a 12.7-acre park located approximately six blocks north of the Davies Campus at Hayes and Steiner Streets with an open space area, tennis court, and a playground.[53] Directly west of the campus (approximately four blocks) is Buena Vista Park at Buena Vista Avenue and Haight Street. This 36-acre hilltop park distinguishes itself by its forest-like appearance and cityscape vistas, and offers open space areas, dirt trails, tennis courts, and a playground.[54] Corona Heights Park is located at Roosevelt and Museum Ways, approximately three blocks southwest of the Davies Campus. This park, which also hosts the Randall Museum (located on Museum Way), provides 16.8 acres of open space, a nursery school, community garden, fenced park for dogs, tennis courts, and a 60-foot-high sheer rock wall.[55] Also located within Corona Heights Park are the Peixotto Playground to the northeast and the States Street Playground to the south. Duboce Park adjoins the Davies Campus to the north at Duboce Avenue and Scott Street. This 4.3-acre park features baby swings, play structures, a sand play area, a basketball court, and a large grass field for dogs.[56] At the southwest end of the park (along Scott Street) is the Harvey Milk Recreational Arts Center, a regional facility that houses citywide programs in theater, music, and dance.[57, 58] The Eureka Valley Playground (1.9 acres), also known as Collingwood Park, is located seven blocks south of the Davies Campus at Collingwood and 18th Streets and consists of a baseball diamond, tennis court, dog run, and recreation center.[59] Koshland Park, a 0.82-acre mini park with a community garden and half basketball court, and Page Street Community Garden, are both located on Page Street approximately 10 blocks northeast of the Davies Campus.[60] The eastern portion of Panhandle Park falls within one-half mile of the Davies Campus between Fell and Oak Streets. This long, narrow park is 24 acres in size and

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53 A View on Cities. 2009. Alamo Square. Available: http://www.aviewoncities.com/sf/alamosquare.htm. Accessed June 2009.

54 The Bandit Notes. 2000. Buena Vista Park. Available: http://www.josephstubbscreations.com/Home2/sf/sfparks/buenavista/buenavista.html. Last updated April 2000. Accessed June 2009.

55 Neighborhood Parks Council. 2009. Corona Heights Park History. Available: http://www.sfnpc.org/coronahistory. Accessed June 2009.

56 Neighborhood Parks Council. 2009. ParkScan San Francisco: Duboce Park. Available: http://www.parkscan.org/parks?parkId=132. Accessed June 2009.

57 Neighborhood Parks Council. 2009. Park Histories: Duboce Park and Harvey Milk Recreation Center. Available: http://www.sfnpc.org/duboceharveymilkhistory. Accessed June 2009.

58 The Harvey Milk Recreational Arts Center is currently closed (with classes relocated) for the $7,995,000 renovation funded by the 2000 Park Bond and managed by the Recreation and Park Department's Capital Improvement Division.

59 Golden Gate Mothers Group. 2009. Playground Summary: Eureka Valley Playground & Recreation Center (Collingwood Park). Available: http://www.ggmg.org/Playgrounds/eureka_valley.html. Accessed June 2009.

60 Neighborhood Parks Council. 2009. ParkScan San Francisco: Koshland Park. Available: http://www.parkscan.org/parks?parkId=73. Accessed June 2009.

includes pedestrian and bicycle paths, basketball courts, and a playground.[61] The Noe-Beaver Mini Park is an open space area with a community garden located at the intersection of Noe and Beaver Streets, approximately three blocks south of the Davies Campus.[62] Located one block southwest of the Davies Campus, the Roosevelt and Henry Stairs (0.34 acre) is a publicly accessible pedestrian pathway that connects Henry Street and Roosevelt Street.[63, 64] The Saturn Street Steps (0.10 acre) is a unique hillside stairway lined with vegetation located on Ord and Saturn Streets, approximately eight blocks southwest of the Davies Campus.[65]

The seven non-SFRPD facilities are the Castro Commons, Divisadero Street Parklet, Dolores Parkway, Dolores Street Community Gardens, and Noe, Sanchez, and Waller Street Parks. The recent completion of Castro Commons (May 2009) is part of San Francisco's Pavement to Parks initiative,[66] which seeks to reclaim unused swathes of pavement and turn them into new public plazas and parks. Located along the intersection of 17th and Castro Streets (approximately five blocks south), Castro Commons now serves as an expanded sidewalk with potential for café seating.[67] The Divisadero Street Parklet, located approximately seven blocks north of Davies Campus on Divisadero Street between Hayes and Grove Streets, is also part of the Pavement to Parks initiative. This new type of Pavement to Parks project repurposes two to three parking stalls along a block into a platform for people to sit, drink a cup of coffee, and enjoy the city around them. The Divisadero Parklet currently has three café tables, 10 café chairs, a bench, three bike racks, landscaped planters, solar lighting, and a solar receiving panel. [68] The Dolores Parkway is a median along Dolores Street that runs north to south between Market Street and San Jose Avenue (six blocks southeast) and the Dolores Street Community Garden is a private open space owned by Dolores Street Community Services (four blocks southeast).

In addition, there are three street parks within one-half mile of the Davies Campus: the Noe, Sanchez, and Waller Street Parks. Street Parks is a partnership between DPW, the San Francisco Parks Trust, and the residents of San Francisco to develop and create community managed gardens on public rights-of-way owned by DPW.[69] The John Muir Schoolyard, located at John Muir Elementary School on 380 Webster Street, is approximately nine

[61] Neighborhood Parks Council. 2010. ParkScan San Francisco: Panhandle Park. Available: http://www.parkscan.org/parks?parkId=75 Accessed February 2010.

[62] Neighborhood Parks Council. 2010. Park Scan San Francisco: Noe-Beaver Mini Park. Available: http://www.parkscan.org/parks?parkId=143. Accessed February 2010.

[63] Trails Web site. 2010. Trail Finder. Corona Heights Stairway Walks. Available: http://www.trails.com/tcatalog_trail.aspx?trailid=XWP017-015. Accessed April 2010.

[64] Wikimapia. 2010. Henry Street Steps. Available: http://wikimapia.org/#lat=37.7668665&lon=-122.437579&z=19&l=0&m=s&v=9. Accessed April 2010.

[65] Neighborhood Parks Council. 2009. ParkScan San Francisco: Saturn Street Steps (Open Space). Available: http://www.parkscan.org/parks?parkId=145. Accessed November 2009.

[66] "Pavement to Parks" is a collaborative effort between the Mayor's Office, the San Francisco Department of Public Works, the San Francisco Planning Department, and the San Francisco Municipal Transportation Agency (http://sfpavementtoparks.sfplanning.org/index.htm).

[67] Pavement to Parks. 2010. 17th and Castro "Castro Commons." Available: http://sfpavementtoparks.sfplanning.org/castro_commons.htm. Accessed April 2010.

[69] San Francisco Department of Public Works. 2010. Street Parks Program. Available: http://www.sfgov.org/site/sfdpw_page.asp?id=66230 Accessed April 2010.

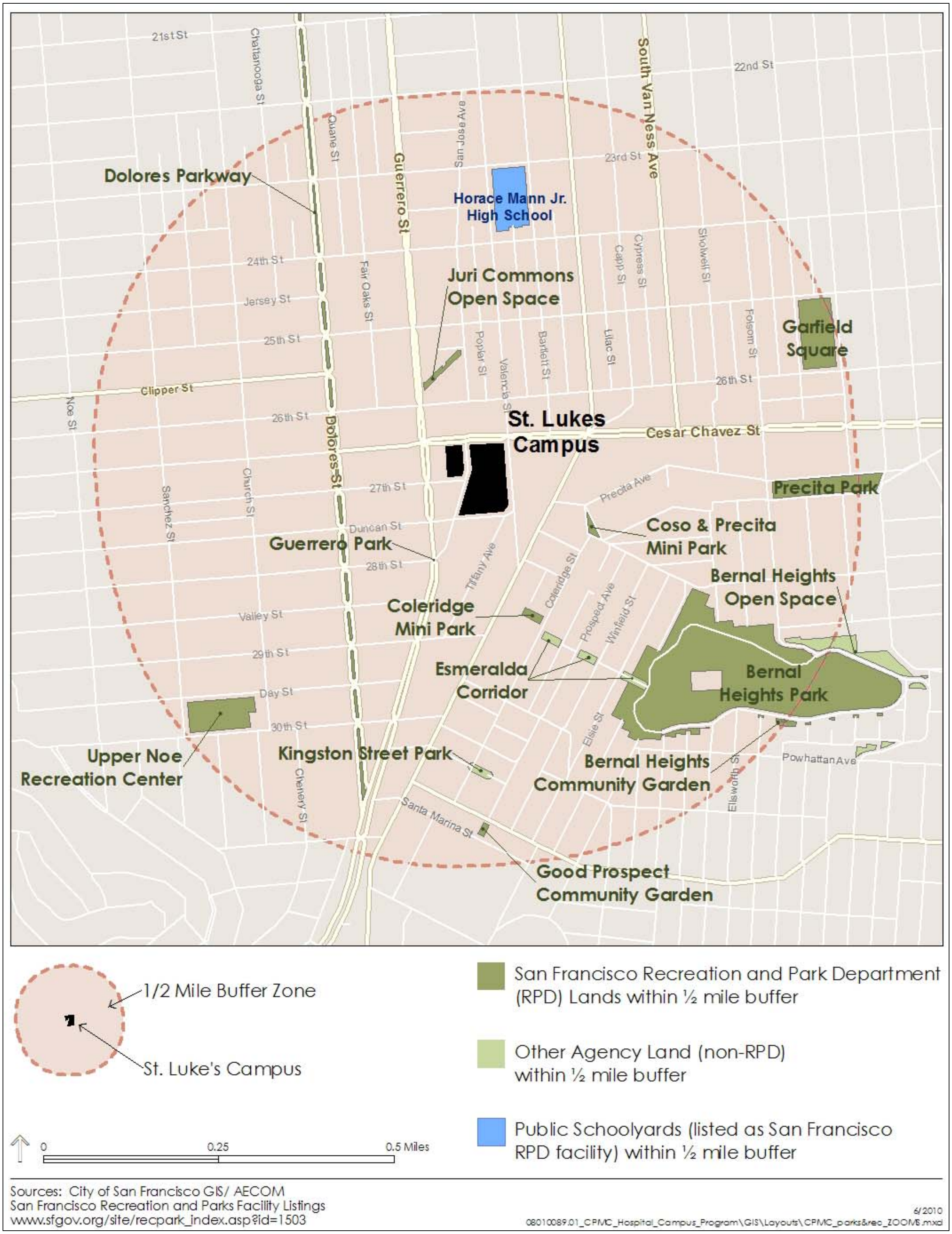
[69] San Francisco Department of Public Works. 2010. Street Parks Program. Available: http://www.sfgov.org/site/sfdpw_page.asp?id=66230 Accessed April 2010.

blocks northeast of the Davies Campus.[70] The McKinley Elementary School, located nearby at 1025 14th Street, is approximately 0.1 mile southwest of the Davies Campus.

Recreational Resources at the Davies Campus

The Davies Campus has one open space area known as Terrain Park, which was completed in November 2007. Terrain Park is designed to provide physical therapy features in a semioutdoor environment for rehabilitation center patients. This semienclosed terrain park is located in the existing sunken landscaped area between the Castro Street/14th Street Parking Garage and the Davies Hospital South Tower. Refer to Figure 2-44, "Davies Campus—Existing Site Plan," on page 2-153 of this EIR for more information regarding on-site parks and open space areas.

[70] San Francisco Recreation & Park Department. 2009. Facility Listings. Available: http://ci.sf.ca.us/site/recpark_index.asp?id=1503. Accessed December 2009.



Source: Data compiled by AECOM in 2009 based on San Francisco Enterprise GIS Program data

Parks and Open Spaces within One-Half Mile of the St. Luke's Campus **Figure 4.10-6**

Table 4.10-5
Parks and Related Facilities within One-Half Mile of the St. Luke's Campus

Facility	Park Acres	Acres within One-Half Mile
Facilities Operated by SFRPD		
Bernal Heights Park (including community garden)	26.32	20.71
Coleridge Mini Park	0.21	0.21
Coso & Precita Mini Park	0.15	0.15
Garfield Square	2.93	2.81
Good Prospect Community Garden	0.11	0.11
Juri Commons Open Space	0.32	0.32
Precita Park	2.21	1.79
Upper Noe Recreation Center	2.51	2.51
Non-SFRPD Facilities		
Bernal Heights Open Space	2.09	0.50
Dolores Parkway	2.83	1.73
Esmeralda Corridor (at Winfield Street)	0.19	0.19
Esmeralda Corridor (at Coleridge Street and Lundy's Lane)	0.19	0.19
Esmeralda Corridor (at Elsie Street)	0.27	0.27
Guerrero Park	< 0.1	< 0.1
Kingston Street Park	0.25	0.25
Public Schoolyards		
Horace Mann Junior High School	2.57	2.57
TOTAL	**43.15**	**34.31**

Notes: SFRPD = San Francisco Recreation & Park Department. Non-SFRPD lands refer to land owned by other agencies such as the Golden Gate National Recreation Area, State of California, San Francisco Department of Public Works, San Francisco Redevelopment Agency, San Francisco Water Department, Port of San Francisco, San Francisco Municipal Railway, and private entities. Schoolyards listed include those affiliated with SFRPD. Acreage totals do not include parks with less than 0.1 acre.
Source: Data compiled by AECOM in 2010 based on GIS data provided by San Francisco Planning Department.

ST. LUKE'S CAMPUS

Nearby Parks and Open Space Facilities

As shown in Figure 4.10-6 (page 4.10-23) and listed in Table 4.10-5, "Parks and Related Facilities within One-Half Mile of the St. Luke's Campus," SFRPD properties within one-half mile of the St. Luke's Campus consist of eight open space areas, parks, community gardens, and recreation centers. Several non-SFRPD properties and the Horace Mann Gym are also located nearby.

As shown in Figure 4.10-6, Bernal Heights Park is located on Bernal Heights Boulevard, eight blocks southeast of the St. Luke's Campus. This 26-acre park features a rocky hill with a view and has a community garden along the south side of the park.[71] Coleridge Mini Park (0.21 acre) is an open space area located on Coleridge Street between Virginia and Fair Avenues, three blocks south of the campus site.[72] The Coso and Precita Mini Park, which consists of a small triangular plot of open space (0.15 acre), is located at the intersection of Coso Avenue and Precita Avenue, approximately two blocks east of the St. Luke's Campus.[73] Garfield Square, an approximately 3.0-acre park with a clubhouse, community pool, picnic areas, an artificial turf playfield, and children's play structures, is located at 25th and Harrison Streets, roughly seven blocks northeast of the St. Luke's Campus.[74] The 0.11-acre Good Prospect Community Garden is located on Prospect and Cortland Avenues (approximately eight blocks south) and consists of a stairway with landscaped areas.[75] The Juri Commons open space area (0.32 acre) is a tree-lined mini park that contains a children's playground. This open space area is located two blocks north of the St. Luke's Campus at Guerrero and 25th Streets.[76] Approximately four blocks east of the campus at Precita and Folsom Streets is Precita Park, a 2.2-acre park equipped with a children's play area and garden.[77] The recently renovated Upper Noe Recreation Center (2.5 acres) is situated six blocks southwest of the project site at Day and Sanchez Streets and includes a new playground, indoor gym, baseball diamond and multipurpose field, basketball and tennis courts, and a recreation center.[78]

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[71] Neighborhood Parks Council. 2010. ParkScan San Francisco: Bernal Heights Park. Available: http://www.parkscan.org/parks?parkId=387. Accessed February 2010.

[72] Neighborhood Parks Council. 2009. ParkScan San Francisco: Coleridge Mini Park (Open Space). Available: http://www.parkscan.org/parks?parkId=155. Accessed June 2009.

[73] Neighborhood Parks Council. 2009. ParkScan San Francisco: Coso-Precita Mini Park. Available: http://www.parkscan.org/parks?parkId=157. Accessed December 2009.

[74] Neighborhood Parks Council. 2010. ParkScan San Francisco: Garfield Square Park. Available: http://www.parkscan.org/parks?parkId=159. Accessed February 2010.

[75] Nextstop. 2010. Good Prospect Community Garden. Available: http://www.nextstop.com/p/srfg2zfr-hg/right-on-prospect-avenue/. Accessed April 2010.

[76] Neighborhood Parks Council. 2010. ParkScan San Francisco: Juri Commons. Available: http://www.parkscan.org/parks?parkId=162. Access February 2010.

[77] Neighborhood Parks Council. 2010. ParkScan San Francisco: Precita Park. Available: http://www.parkscan.org/parks?parkId=2. Accessed February 2010.

[78] Neighborhood Parks Council. 2010. ParkScan San Francisco: Upper Noe Rec Center. Available: http://www.parkscan.org/parks?parkId=149. Accessed February 2010.

The seven non-SFRPD facilities are the Bernal Heights Open Space, Dolores Parkway, Esmeralda Corridor (at Winfield Street, at Coleridge Street and Lundy's Lane, and at Elsie Street), Guerrero Park, and Kingston Street Park. The Bernal Heights Open Space consists of approximately 2 acres of land along the northeast periphery of Bernal Heights Park. The Dolores Parkway is a median along Dolores Street that runs north to south between Market Street and San Jose Avenue (four blocks northwest). The Esmeralda Corridor, totaling 0.65 acre, consists of three parcels located along Esmeralda Avenue, approximately five to eight blocks southeast). The 0.19-acre parcel located along Esmeralda Avenue and Winfield Streets is locally known as the "Bernal Heights Mini-Park Slides" and consists of two metal slides that are about 40 feet long.[79] The 0.19-acre parcel located on Esmeralda Avenue between Coleridge Street and Lundy's Lane features a playground and a stairway.[80] The 0.27-acre parcel located on Esmeralda and Elsie Street is a continuation of Esmeralda Avenue as a stairway on the west side of Bernal Heights Park.[81]

Guerrero Park, also part of San Francisco's Pavement to Parks initiative, is located along San Jose Avenue at Guerrero and 28th Streets, approximately one block southwest of the campus. This intersection is now transformed into a plaza with a variety of native and drought-tolerant plants and planter beds made of reclaimed logs from Golden Gate Park. Café tables and chairs are brought out in the morning and taken in at night. Future plans for the plaza include a children's play structure. The cost of the park was covered by donations from community partners, including the CPMC St. Luke's Campus, which was listed as the major donor.[82] Kingston Street Park is a 0.25-acre park located approximately five blocks south of the campus. As mentioned earlier, the Street Park program is based on a partnership between DPW, the San Francisco Parks Trust, and the residents of San Francisco to develop and create community managed gardens on public rights-of-way owned by DPW.[83] The Horace Mann Gym, located at the Horace Mann Junior High School at 3351 23rd Street, is approximately four blocks north of the campus.[84]

Recreational Resources at the St. Luke's Campus

There are three open space areas within the St. Luke's Campus. According to the site plan, a courtyard is bounded by the 1912 Building to the east, the Duncan Street Parking Garage to the south, and the Hartzell Building (555 San Jose Avenue) to the west. The MRI Trailer connected to the 1912 Building occupies a large portion of this

[79] Yelp. 2010. Bernal Heights Mini-Park slides. Available: http://www.yelp.com/biz/bernal-heights-mini-park-slides-san-francisco-2. Accessed April 2010.

[80] San Francisco Days. 2010. Bernal Heights/Cortland Avenue. Available: http://www.sanfranciscodays.com/bernal-heights/. Accessed April 2010.

[81] Nextstop. 2010. Neighborhood Stairways of San Francisco. Available: http://www.nextstop.com/guide/MXYXpeocYrs/neighborhood-stairways-of-san-francisco/. Accessed April 2010.

[82] Pavement to Parks. 2010. Guerrero Park. Available: http://sfpavementtoparks.sfplanning.org/guerrero_park.htm. Accessed April 2010.

[83] San Francisco Department of Public Works. 2010. Street Parks Program. Available: http://www.sfgov.org/site/sfdpw_page.asp?id=66230. Accessed April 2010.

[84] San Francisco Recreation & Park Department. 2009. Facility Listings. Available: http://ci.sf.ca.us/site/recpark_index.asp?id=1503. Accessed December 2009.

courtyard, with buildings on three sides. There are two parking stalls next to the 1957 Building for ambulances/emergency vehicles, a smoking shelter, two 15-minute parking spaces for Emergency Department drop-offs, and a walkway from the Duncan Street Parking Garage and the Hartzell Building to the 1957 and 1970 Buildings. There is a small paved strip that is not publicly accessible between the walkway and the MRI Trailer.[85]

The two remaining open space areas are located on both sides of the stairway entrance into the 1912 Building from Valencia Street. These landscaped areas are meant to enhance the entrance into the 1912 Building; they are blocked off by fencing and are currently not accessible to the public. Refer to Figure 2-58, “St. Luke’s Campus—Existing Site Plan,” on page 2-195 of this EIR for more information regarding on-site parks and open space areas.

4.10.2 REGULATORY FRAMEWORK

FEDERAL

The NPRA formerly required 10 acres of open space per 1,000 city residents. However, the NPRA no longer recommends a single absolute “average” park acreage per population, in recognition of the fact it is more relevant for each area plan and its program facilities to be based on community need. More important than acreage is accessibility (location and walking distance) and whether the facility provides needed services to the population in question.[86] Based on San Francisco’s estimated 2008 household population (824,525 persons)[87], the 5,848 acres of parkland result in approximately 7.1 acres per 1,000 residents, somewhat less than the former NPRA standard. Because of San Francisco’s high density and limited land mass, the ratio is difficult to achieve.[88]

STATE

CEQA requires the analysis of potential impacts on parks and recreational facilities. An impact can be physical in nature (actual taking of or encroachment on the facility) or it can be related to the users’ enjoyment of the facility (e.g., increased noise, decreased safety).[89]

Quimby Act

The Quimby Act (California Government Code, Section 66477) was established by the California Legislature in 1965 to preserve open space and parkland in the rapidly urbanizing areas of the state. This legislation was in response to California’s increased rate of urbanization and the need to preserve open space and provide parks and

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85 Massehian, Vahram. Senior project manager. Sutter Health. San Francisco, CA. May 27, 2010—email message to Stephanie Klock of AECOM regarding open spaces at the St Luke’s Campus.

86 San Francisco Planning Department. 2008 (August 7). *Eastern Neighborhoods Rezoning and Area Plans Environmental Impact Report.* Planning Department Case No. 2004.0160E. State Clearinghouse No. 2005032048. San Francisco, CA. Page 372.

87 California Department of Finance. 2008 (January). Table 2, “E-5 City/County Population and Housing Estimates, 1/1/2008.” Sacramento, CA.

88 San Francisco Planning Department. 1986. *San Francisco General Plan*, Recreation and Open Space Element. San Francisco, CA.

89 California Department of Transportation and San Francisco County Transportation Agency. 2008 (September). *South Access to the Golden Gate Bridge. Doyle Drive Final Environmental Impact Statement/Environmental Impact Report.* Available: http://www.presidioparkway.org/pdfs/feis/3_2.pdf, Accessed June 6, 2010. Section 3.2.2, Parks and Recreation.

recreational facilities for California's growing communities. The Quimby Act authorizes local governments to establish ordinances requiring developers to dedicate parks, pay an in-lieu fee, or perform a combination of the two. The City has not established a citywide target ratio of parkland to San Francisco residents, nor has it adopted a Quimby Act ordinance requiring land dedications or in-lieu fees, because San Francisco's population density, small land mass, and other development constraints make such policies infeasible.[90]

CITY/LOCAL

Because of the scarcity and high cost of vacant land in San Francisco, existing recreational facilities represent a major city resource. Opportunities to acquire new parkland and develop recreational facilities are limited; therefore, the General Plan's Recreation and Open Space Element has identified certain high-need areas, which are given highest priority for the construction of new parks and recreation improvements. As shown in Map 9 of the Recreation and Open Space Element, titled "Neighborhood Recreation and Open Space Improvement Priority Plan," the proposed Cathedral Hill Campus location is identified as a "high-need area" where the City seeks to provide new open space in the vicinity.[91] In addition, various parts of the General Plan describe areas of San Francisco that would be desirable to acquire or convert to open space. According to Map 4 of the Recreation and Open Space Element, titled "Citywide Recreation and Open Space Plan," none of the existing or proposed CPMC campus sites are located within areas identified as desirable for conversion to public open space.[92] Please refer to page 3-6 in Chapter 3, "Plans and Policies," and to the Recreation and Open Space Element for more information.

The City does not have an adopted parkland-to-population ratio standard and recognizes that San Francisco is likely to provide less open space acreage per resident than the former NPRA standard of 10 acres per 1,000 residents. However, the General Plan's adopted Recreation and Open Space Element does make reference to the parkland-to-population ratio at the time of the General Plan's adoption (1986), which is 5.5 acres per 1,000 residents. The Recreation and Open Space Element also, however, states that to the extent it reasonably can, the City should increase per capital supply of public open space in the City. Because the City does not establish an acceptable level of public open space provision and recreational service related to population density, this analysis uses the 5.5 ratio as a benchmark. Maintaining a ratio of 5.5 acres of parkland per 1,000 people would meet the demand for recreational facilities without causing or accelerating a substantial physical deterioration of facilities or requiring the construction of further facilities. The 2008 ratio of 7.1 acres per 1,000 residents will also be used as a comparative measure, because this ratio is more recent and representative of the current baseline standard. Because the focus of the updated Recreation and Open Space Element is moving away from using a ratio of required open space, the discussion of parkland to population ratios is presented for informational purposes only.

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[90] Ibid.
[91] Ibid., Map 9, "Neighborhood Recreation and Open Space Improvement Priority Plan."
[92] Ibid., Map 4, "Citywide Recreation and Open Space Plan."

The 1986 Recreation and Open Space Element's benchmark of 5.5 acres per 1,000 residents provides for more parkland than other commonly used standards across the state. For example, the state's Quimby Act allows jurisdictions to select a standard from 3 to 5 acres of parkland per 1,000 residents when imposing a parkland mitigation requirement. Other Bay Area jurisdictions (e.g., the cities of Palo Alto and Menlo Park) use a standard of 5 acres per 1,000 residents. Nevertheless, San Francisco seeks to increase the per capita supply of public open space through legislation, funding, and open space acquisition programs.[93]

The General Plan's Recreation and Open Space Element provides the City's objectives and policies related to preservation, access, use, and development of recreational opportunities in San Francisco. The Planning Department released a revised draft Recreation and Open Space Element for public review in early May 2009, with the comment and review period ending in late September 2009.[94, 95] The consistency of the LRDP with the 1986 Recreation and Open Space Element is discussed in Chapter 3, "Plans and Policies."

San Francisco Planning Code

The San Francisco Planning Code (Planning Code) requires usable open space in conjunction with development projects. As a part of the permitting process, project sponsors are required to incorporate certain amounts of open space, dependent on a proposed project's use and size as well as zoning district in which the site is located, to serve future project residents and/or personnel. As an institutional use and based on the zoning district where each campus are located, the proposed LRDP is not subject to any open space requirement.

Planning Code Section 295, the Sunlight Ordinance, was adopted in November 1984, pursuant to voter approval of Proposition K, to regulate new shadows cast on open spaces. Refer to Impact WS-2, beginning on page 4.9-33 in Section 4.9, "Wind and Shadow," for more information on project-generated shadows and their effects on available sunlight on parks and open space areas.

4.10.3 CUMULATIVE CONDITIONS

The potential contribution of the proposed CPMC LRDP to cumulative impacts on recreation is evaluated in the context of existing, proposed, and reasonably foreseeable future development expected in San Francisco.

4.10.4 SIGNIFICANCE CRITERIA

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been adopted and modified by the San

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[93] San Francisco Planning Department. 2009. Draft Recreation & Open Space Element Update 2009. Available: http://openspace.sfplanning.org/. Accessed December 2009.

[94] Ibid.

[95] Exline, Sue. Citywide Policy Planner. San Francisco Planning Department. San Francisco, CA. April 20, 2010—telephone call with Stephanie Klock of AECOM regarding status of Recreation & Open Space Update.

Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the project would result in a significant impact on recreation conditions. Implementation of the proposed project would have a significant effect on recreation if it would:

- 10a—increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated;
- 10b—result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered park or recreational facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, or other performance objectives;[96]
- 10c—include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment; or
- 10d—adversely affect existing recreational opportunities.

4.10.5 IMPACT EVALUATIONS

METHODOLOGY

Impacts on recreation were determined on a citywide basis by analyzing the estimated increase in residential population as a result of LRDP buildout in both the near term (2006–2015) and the long term (2015–2030). A systemwide analysis was also conducted by combining near-term and long-term LRDP projects from 2006 to full buildout in 2030. Given that development under the CPMC LRDP would occur in various parts of San Francisco, project-related demand for recreational facilities would not be concentrated in a specific area, but would be spread throughout the city. Therefore, it is reasonable to assume that demand for parks and open space related to these new residents would also be similarly distributed citywide. The residential population projections for both near-term and long-term projects under the LRDP, as provided in Table 4.10-6, were evaluated to determine whether new recreational facilities would be needed to provide adequate future service. Localized impacts resulting from the increase in daily population (i.e., total of CPMC personnel, patients, and visitors) at each campus are also briefly discussed. Table 4.10-6, “Daily Campus Population, Change in Personnel and Increase in San Francisco Households and Population, by Campus,” provides a summary of the increase in daily population on each CPMC campus and projected change in personnel that would be generated at each of the campuses with the proposed LRDP. The table also provides a summary of the change in the number of households and population in San Francisco that would result from the LRDP implementation. The information provided in Table 4.10-6 was used in this DEIR to determine whether increases in daily campus population and citywide housing and population would have a significant impact on recreational resources.

[96] Significance criteria 10a and 10b are discussed together.

No analysis of recreation impacts was conducted for the California Campus because no project construction would occur at this campus, and it is expected that all inpatient functions at the California Campus would be transferred to the proposed Cathedral Hill Campus once the Cathedral Hill Hospital is opened in 2015 with other services transferring to the Pacific Campus. The increase in employment as well as household and population growth projections for San Francisco are further discussed in Section 4.3, "Population, Employment, and Housing." This analysis considers the increase in use of open space and recreational facilities that would be generated with implementation of the CPMC LRDP and the ability of existing facilities to meet that demand, and determines whether an increase in this use would result in the substantial physical deterioration of existing recreational facilities or the need for new or expanded facilities.

This analysis considers parkland-to-population ratio to measure demand for recreational facilities for informational purposes only, since the City has not established an acceptable level of public open space/ recreational facilities provision or target ratio of parkland to residents. Impacts on recreation were assessed by comparing the existing baseline citywide parkland-to-population ratio in 2008 (7.1 acres per 1,000 residents) to the new ratio that would result from the total LRDP increase in population in the near term (2006–2015) and long term (2015–2030), and a combination of both (2006–2030). In the past, the NPRA has recommended a parkland-to-population ratio of 10 acres per 1,000 residents. However, the City does not have an adopted parkland-to-population ratio standard and uses the 1986 ratio of 5.5 acres per 1,000 residents as a benchmark. As noted in the General Plan's 1986 Recreation and Open Space Element, however, "[g]iven the City's existing development patterns, high population density, and small land mass (28,918 acres), [this] standard will not be possible to achieve within the City limits."[97] The General Plan goes on to state that "to the extent it reasonably can, the City should increase the per capita supply of public open space within the City" from the parkland-population ratio at the time of the General Plan's adoption (1986), which was 5.5 acres per 1,000 residents. A ratio of 5.5 acres of parkland per 1,000 people is sufficient to meet demand for recreational facilities without causing or accelerating a substantial physical deterioration of facilities or requiring the construction of further facilities. Therefore, this analysis compares the future parkland-to-population ratios resulting from the CPMC LRDP to both the 1986 ratio of 5.5 acres per 1,000 residents and the 2008 ratio of 7.1 acres per 1,000 residents.

PRESENTATION OF IMPACTS IN THIS SECTION

As described in Chapter 2, "Project Description," the LRDP would be implemented in two phases: the "Near Term" (i.e., projects beginning construction between 2011 and 2015) and the "Long Term" (projects that will significantly commence after 2015 or are contingent on the completion of the near-term projects). For purposes of this EIR analysis, population and employment projections are provided for years 2015 and 2030. However, the

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[97] San Francisco Planning Department. 1986. *San Francisco General Plan*, Recreation and Open Space Element. Policy 2.1. San Francisco, CA.

increase in employment at the CPMC campuses, and the resulting population growth in San Francisco that could result from implementation of the LRDP, would occur incrementally over several years. Once the proposed Cathedral Hill Hospital and Cathedral Hill MOB are completed and operational in 2015, a shift of services among all of the existing CPMC campuses would occur. For example, the acute-care services currently offered at the Pacific Campus and the Women's and Children's Center at the California Campus would be relocated to the proposed Cathedral Hill Hospital. Once this transfer of services occurs, the existing 2333 Buchanan Street Hospital would be converted into the Ambulatory Care Center (ACC), the ACC Addition would be constructed, and the Pacific Campus would be converted to the CPMC's primary outpatient-care campus north of Market Street. By 2020, all existing services at the California Campus would be transferred to other campuses.

Although construction and renovation at the Cathedral Hill, Pacific, Davies, and St. Luke's Campuses under the LRDP is expected to be completed by 2020, it would take several years for a shift in employment and population to occur.

Table 4.10-6
Daily Campus Population, Change in Personnel, and Increase in San Francisco Households and Population, by Campus

Campus	Daily Population[1]	Projected Change in Personnel[2]			San Francisco Households[2]			Increase in Population[3]		
	Net New Campus Population 2006–2030[4]	Near-Term Change 2006–2015	Long-Term Change 2015–2030	Combined Near- and Long-Term Projects at Buildout (2006–2030)	Near-Term Change 2006–2015	Long-Term Change 2015–2030	Combined Near- and Long-Term Projects at Buildout (2006–2030)	Near-Term Change 2006–2015	Long-Term Change 2015–2030	Combined Near- and Long-Term Projects at Buildout (2006–2030)
Cathedral Hill	9,570	4,030	590	4,620	1,440	210	1,650	3,230	620	3,850
Pacific	(1,450)	(1,850)	1,270	(580)	(660)	450	(210)	(1,480)	1,000	(480)
California[5]	(3,540)	(1,150)	(480)	(1,630)	(410)	(170)	(580)	(920)	(440)	(1,360)
Davies	1,150	170	660	830	60	240	300	140	560	690
St. Luke's	1,200	600	330	930	210	120	330	480	300	770
Total	**6,930**	**1,800**	**2,380**	**4,170**	**640**	**850**	**1,490**	**1,440**	**2,040**	**3,480**

Notes:

1 Daily Population refers to on-campus population only (i.e. CPMC personnel, patients, and visitors).

2 Numbers have been rounded to the nearest 10th.

3 Increase in population refers to the number of new residents dispersed throughout the city (indirect result of employment growth).

4 Potential average daily population numbers were derived under the conservative assumption that full buildout would occur by 2020.

5 There would be no net new population growth at the California Campus, as it is expected that all inpatient functions at the California Campus would be transferred to the proposed Cathedral Hill Campus once the Cathedral Hill Hospital is operational in 2015, with non-acute care services transferring to Pacific Campus by 2020.

Sources: California Department of Finance. 2009. *E-5 Population and Housing Estimates for Cities and Counties.* Sacramento, CA.

Association of Bay Area Governments. 2007. *Projections 2007.* Oakland, CA.

CPMC personnel projections provided by Navigant Consulting in 2008 and CPMC in 2010; data compiled by AECOM in 2010. Adavant Consulting provided the daily population numbers.

IMPACT RE-1 *The project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated. The project also would not result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered park or recreational facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, or other performance objectives. (Significance Criteria 10a and 10b)*

Levels of significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*
- *California Campus (negative demand offsets part of systemwide demand from Cathedral Hill): Less than significant*
- *Combined local impacts (near term and long term): Less than significant*
- *Citywide (near term and long term): Less than significant*
- *CPMC LRDP projects at full buildout (2030): Less than significant*

Near-Term Projects

◆ Cathedral Hill Campus

The near-term projects for the proposed Cathedral Hill Campus involve transferring the existing acute-care and Women's and Children's Hospital services from CPMC's Pacific and California Campuses to the proposed Cathedral Hill Hospital. The daily population at the Cathedral Hill Campus at full operation—including personnel, patients, and visitors—is estimated to be approximately 9,570 people. This estimate provides a conservative assumption in the near term, because although the Cathedral Hill Campus would be operational in 2015 and the majority of the estimated daily population increase at this campus would have occurred by that point, the full population increase estimated for the campus would not have occurred yet. The new personnel, patients, and visitors associated with the proposed Cathedral Hill Campus could result in increased use of existing neighborhood parks, particularly during the lunch hour or before or after shifts. The proposed Cathedral Hill Campus would generate approximately 4,030 new personnel. These personnel would have lunch breaks at different times (because they would work various shifts), and only a fraction of daytime personnel at any one time would potentially use nearby parks or open space for lunch or before or after work. Because the Cathedral Hill Hospital would be an inpatient acute-care facility, it would be operational 24 hours per day. The use of nearby recreation spaces by CPMC personnel is expected to be spread over different times of day, 7 days a week, whereas resident usage would be more during the evening and weekend hours. Patients and visitors are not expected to substantially increase their use of nearby parks, because their visits to the Cathedral Hill Campus would be mainly focused on health care services. Therefore, nearby parks would likely be used during all times of the day and throughout the week. However, any increase in use by patients and visitors would be incidental and result in incremental use of nearby recreational facilities and open space.

Implementing the LRDP at the proposed Cathedral Hill Campus would intensify the activity and uses on campus and could generate more trips to local nearby parks than under current conditions. Although some of these people might visit recreational facilities in the campus vicinity, such usage is not expected to result in substantial physical deterioration of nearby facilities or facilities areawide. **This impact would be less than significant.**

Cathedral Hill Campus with No Van Ness Avenue Pedestrian Tunnel Variant: The proposed Van Ness Avenue pedestrian tunnel would be constructed entirely underground and would not interfere with nearby parks and open space areas. However, as described in Section 4.13, “Biological Resources,” excavation and construction of the proposed tunnel would damage or require the removal of a portion of street median landscaping (which is not considered recreational space) that includes small trees and shrubs. A landscape plan is proposed for tree replacement. However, tunnel construction would affect only the median of a busy urban street, rather than a park or other facility used for recreation. As a result, with the pedestrian tunnel eliminated from near-term projects for the Cathedral Hill Campus under this project variant, this impact would be identical to the impact of the near-term projects described above. Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill Campus in the near term.

◆ Davies and St. Luke’s Campuses

The near-term projects proposed at the Davies and St. Luke’s Campuses under the LRDP could increase usage of nearby recreational facilities. Implementing these projects at the Davies and St. Luke’s Campuses would increase the number of personnel at these campuses by 170 and 600, respectively. Some of these people might use neighborhood recreational facilities (e.g., CPMC personnel visiting a local park on their lunch break), but this additional usage is not expected to result in a substantial increase in demand for nearby recreational facilities. Although approximately 170 and 600 new personnel, respectively, would be generated at the Davies and St. Luke’s Campuses, they would have lunch breaks at different times (because they would work various shifts); in addition, only a fraction of daytime personnel at any one time would potentially use nearby park grounds for lunch or before or after work. The use of nearby recreational spaces by CPMC personnel is expected to be spread over different times of day, 7 days a week, whereas resident usage would occur more often during the evening and weekend hours. Visitors and patients are not expected to substantially increase their use of nearby parks, because their visits to the proposed Davies and St. Luke's Campuses would be mainly focused on health care services. Any increase in use by patients and visitors would be incidental and result in incremental use of nearby recreational facilities and open space. For these reasons, **this impact would be less than significant**.

St. Luke's Campus with Alternate Emergency Department Location Variant: Relocating the Emergency Department and ambulance bay for the St. Luke's Replacement Hospital to Cesar Chavez Street under this variant would not affect recreational use. Therefore, this impact would be identical to the impact of the near-term projects described above. **This impact would be less than significant.**

St. Luke's Campus with Cesar Chavez Street Utility Line Alignment Variant: This project variant would not have a different or additional impact on recreational facilities other than the possibility of removal of some trees and landscaping to accommodate the utility relocation. For the same reasons as discussed above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Davies and St. Luke's Campuses in the near term.

◆ Combined Local Impacts of Near-Term Projects

By 2015, net increases of approximately 4,030, 170, and 600 full-time equivalent (FTE) personnel would occur at the Cathedral Hill, Davies, and St. Luke's Campuses, respectively; also, net decreases of approximately 1,850 and 1,150 full-time equivalent would occur at the Pacific and California Campuses, respectively, (see Table 4.10-6). The average daily populations at the Cathedral Hill, Davies, and St. Luke's Campuses (including personnel, patients, and visitors) at full campus operation are estimated to be 9,570, 1,150, and 1,200 people, respectively. These campuses would not be fully occupied in 2015, but the majority of the population increase at the Cathedral Hill Campus would have occurred by that point. An overall net increase of approximately 1,800 full-time personnel is expected to occur between 2006 and 2015 at all CPMC campuses combined, with an associated increase in patients and visitors, and associated activity within all the hospital campuses combined. Some of these people might use neighborhood recreational facilities (e.g., CPMC personnel visiting a local park on their lunch break), but this additional usage is not expected to result in a substantial increase in demand for nearby recreational facilities in the context of citywide demand for these recreational facilities by 2030. For the same reasons as described above, any potential increase in park use would occur over time and result in incremental use of nearby recreational facilities and open space. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at any of the CPMC campuses in the near term.

◆ Citywide Impacts of Near-Term Projects

This section provides a discussion of the demand on neighborhood and regional parks or other recreational facilities that could result from potential new households and new residences created under CPMC's near-term projects. As described in Section 4.3, "Population, Employment, and Housing" (see page 4.3-1), implementing the near-term projects under the CPMC LRDP would result in new and additional medical and medical office uses. No housing component is proposed as part of the CPMC LRDP; therefore, there would be no direct effect on the area's population density. However, employment at all CPMC campuses (combined) in the near term would increase by a net total of approximately 1,800 personnel. Assuming 49% of new personnel would choose to live and work in San Francisco, this would potentially indirectly add approximately 640 net new households and 1,440 net new residents to San Francisco between 2006 and 2015. It should be noted that this increase would occur incrementally over a period of time. Most of this projected increase in population could be attributed to the employment growth at the proposed Cathedral Hill Campus; however, there would be a decrease in employment at the Pacific and California Campuses in 2015 that would offset some of the employment growth at Cathedral Hill by 2015. The distribution of new residents related to CPMC LRDP would be expected to be dispersed throughout the city; therefore, any increase in demand for existing neighborhood and regional parks or other recreational facilities that would result from this potential increase in San Francisco population resulting from CPMC LRDP's near-term projects would also be distributed citywide, and would not place excessive demand on any specific neighborhood or park.

According to projections by the Association of Bay Area Governments (ABAG), San Francisco's total population is expected to be approximately 823,800 residents by 2015.[98] Implementing the near-term projects under the proposed LRDP could add approximately 1,440 net new residents to San Francisco. As noted in Section 4.3, "Population, Employment, and Housing" the potential new residents (1,440) are within the citywide projections for population in 2015 (823,800); therefore, the parkland-to-population ratio would remain at 7.1 acres per 1,000 residents in 2015,[99] the same ratio as in 2008. The parkland-to-population ratio would therefore remain unchanged at buildout of the CPMC LRDP near-term projects between 2006 and 2015 and would be higher than the 5.5 acres per 1,000 residents ratio identified in the General Plan. This indicates that compared to baseline parkland-to-population ratios there would be sufficient parkland and open space to adequately serve the new residential population associated with the proposed near-term projects under the LRDP. Therefore, the demand on

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[98] Refer to Table 4.3-1, "Population Trends and ABAG Projections, San Francisco, 1990–2030," in Section 4.3, "Population, Employment, and Housing."

[99] This calculation uses the current acres of parkland in San Francisco (approximately 5,848 acres) divided by the projected 2015 population of 823,800 = 0.00709.

recreational facilities resulting from implementation of near-term projects under the LRDP would not be substantial in the context of existing citywide demand for these facilities. The demands for neighborhood and regional parks or other recreational facilities that could result from potential new households and new residences created under CPMC LRDP's near-term projects would not represent a considerable contribution to the existing demand for public recreational facilities. Thus, implementation of the LRDP would not result in substantial physical deterioration of existing recreational resources. Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

With implementation of the long-term projects at the Pacific and Davies Campuses, the uses at both of these campuses would remain medical/institutional in nature. The number of personnel at the Pacific Campus would decrease from approximately 2,640 in 2006 to 790 in 2015, as a result of the transfer of services from the Pacific Campus to the proposed Cathedral Hill Campus that would occur upon completion of the Cathedral Hill Hospital in 2015. However, after 2015, the Pacific Campus would become CPMC's primary outpatient-care campus north of Market Street, and the number of FTE personnel working would rebound above 2015 levels (although remaining below 2006 levels). Similarly, the Pacific Campus's overall average daily population (employees, patients, and visitors) is anticipated to experience a net decrease of approximately 1,450 people by 2030 compared to existing conditions, but an increase of 1,270 persons working between 2015 and 2030.

The number of personnel at the Davies Campus would increase from 925 FTE personnel in 2006 to 1,750 FTE personnel by 2030. The Davies Campus's overall average daily population (employees, patients, and visitors) is anticipated to experience a net increase of approximately 1,150 people by 2030 compared to existing conditions, but an increase of 660 persons working between 2015 and 2030. Some of the personnel at Pacific and Davies Campuses might use neighborhood recreational facilities (e.g., CPMC personnel visiting a local park on their lunch break), but this additional usage is not expected to result in a substantial increase in demand for these nearby recreational facilities. Although the Pacific and Davies Campuses would generate approximately 660 and 1,270 net new personnel between 2015 and 2030, respectively, these personnel would have lunch breaks at different times (because they would work various shifts); only a fraction of daytime personnel at any one time would potentially use nearby park grounds for lunch or before or after work. The use of nearby recreational spaces by CPMC personnel is expected to be spread over different times of day, 7 days a week, whereas resident usage would occur more often during the evening and weekend hours. Visitors and patients are not expected to substantially increase use of nearby parks, because their visits to the Pacific and Davies Campuses would be mainly focused on health care services. Any increase in use by patients and visitors would be incidental and result in only an incremental additional use of nearby recreational facilities and open space. For these reasons, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific and Davies Campuses in the long term.

◆ Combined Local Impacts of Long-Term Projects

Between 2015 and 2030, net increases in FTE personnel of approximately 590, 1,270, 660, and 330 people would occur at the Cathedral Hill, Pacific, Davies, and St. Luke's Campuses respectively,, and a net decrease of 480 personnel would occur at the California Campus (see Table 4.10-6). An overall net increase in personnel of approximately 2,380 is expected to occur at CPMC systemwide between 2015 and 2030, as well as an associated increase in patients, visitors, and activity on various CPMC hospital campuses. Some of these people might use neighborhood recreational facilities (e.g., CPMC personnel visiting a local park on their lunch break), but this additional usage is not expected to result in a substantial increase in demand for nearby recreational facilities in the context of citywide demand for these recreational facilities by 2030. For the same reasons as described above, any potential increase in park use would occur over time and result in incremental use of nearby recreational facilities and open space. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at any of the CPMC campuses in the long term.

◆ Citywide Impacts of Long-Term Projects

Implementing the long-term projects under the LRDP would increase employment at CPMC by a total of approximately 2,380 personnel. Assuming 49% of new personnel would choose to live and work in San Francisco, this would indirectly add an estimated 850 net new households and 2,040 net new residents between 2015 and 2030 (see Table 4.10-6). According to ABAG projections, San Francisco's total population is expected to be approximately 922,600 residents by 2030.[100] As noted in Section 4.3, "Population, Employment, and Housing," the projections of change in citywide population and households between 2015 and 2030 under the CPMC LRDP are within the planned population and household projections for San Francisco as estimated by ABAG. The estimated parkland-to-population ratio with the LRDP would be 6.3 acres to 1,000 residents.[101] The ratio of 6.3 acres per 1,000 residents is less than the 2008 ratio of 7.1 acres per 1,000 residents, but would be

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[100] Refer to Table 4.3-1, "Population Trends and ABAG Projections, San Francisco, 1990–2030," in Section 4.3, "Population, Employment, and Housing."

[101] This calculation uses the current acres of parkland in San Francisco (approximately 5,848 acres) divided by the projected 2030 population of 922,600 = 0.0063. This assumption is conservative in that it is unlikely that there would be no additional development of parkland in the city by 2030.

higher than the ratio of 5.5 acres per 1,000 residents noted in the General Plan. In addition, as noted on page 4.10-28, the General Plan noted 5.5 acres per 1,000 residents provides for more parkland than other commonly used standards across the state. Although San Francisco has not established a parkland-to-population ratio, the Quimby Act allows our jurisdiction to select a standard ranging from 3 to 5 acres of parkland per 1,000 residents. Based on this, there would be sufficient parkland and open space in the City to serve the new population associated with the LRDP. Therefore, the potential increase in demand for recreational facilities citywide resulting from the increase in city residents due to CPMC LRDP's long-term projects would not represent a substantial contribution to the existing demand for public recreational facilities citywide, and would also not result in substantial physical deterioration of existing citywide recreational resources. The demand for neighborhood and regional parks or other recreational facilities that could result from potential new citywide households and new residents created under CPMC's long-term projects between 2015 and 2030 would be distributed citywide. These LRDP-related demands would not substantially place undue pressure on and adversely affect specific local neighborhood open space and recreational facilities above and beyond levels expected in dense urban areas such as San Francisco. As a result, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide in the long term.

CPMC LRDP Projects at Full Buildout (2006–2030)

◆ Local Impacts at Buildout

By 2030, the average daily populations (personnel, patients, and visitors) at the Cathedral Hill, Davies, and St. Luke's Campuses would increase relative to existing conditions (2006) by approximately 9,570, 1,150, and 1,200 people, respectively. There would be a net decrease in the daily population at the Pacific Campus of 1,450 people. It is expected that by about 2020 almost all CPMC-related use of the California Campus would cease, and there would be a net decrease in the daily population at the California Campus of approximately 3,540 people. The overall increase in daily population at CPMC campuses systemwide by 2030 (approximately 6,930 people) would likely generate more visitor trips to local parks near the affected CPMC campuses, compared to 2006 existing conditions. The increase in visits to nearby parks and recreational facilities near the Cathedral Hill, Davies, and St. Luke's Campuses would be offset by decreases in local park visits by daily populations at the Pacific and California Campuses. It is also reasonably anticipated that only a fraction of CPMC personnel would use nearby recreational spaces at any given time because they would work different shifts. Further, the visitors and patients to CPMC campuses are not expected to substantially increase use of nearby parks, since their visits to CPMC campuses would be focused on healthcare services. Increases in local park use with LRDP buildout would not be substantial and above and beyond levels expected in dense urban areas such as San Francisco or result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered park or recreational facilities. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at any of the CPMC campuses at full buildout.

◆ Citywide Impacts at Buildout

The combined impact of implementing near-term and long-term projects under the LRDP would increase employment at CPMC systemwide by a net total of 4,170 new FTE personnel by buildout. Assuming 49% of these new CPMC LRDP personnel would choose to live and work in San Francisco, they would indirectly add an estimated 1,490 households and 3,480 new residents to San Francisco between 2006 and 2030 (see Table 4.10-6). According to ABAG projections, San Francisco's total population is expected to be approximately 922,600 residents by 2030.[102] As noted in Section 4.3, "Population, Employment, and Housing," the potential projected change in population and households related to implementation of the CPMC LRDP by 2030 is within the planned population and household projections for San Francisco as estimated by ABAG. The estimated parkland-to-population ratio in 2030 would be 6.3 acres to 1,000 residents.[103] The ratio of 6.3 acres per 1,000 residents would be higher than the ratio of 5.5 acres per 1,000 residents noted in the General Plan. As discussed in detail on page 4.10-28, although San Francisco has not established a parkland-to-population ratio, this would still be higher than the 3 to 5 acres per 1,000 residents ratio considered acceptable per State regulations (Quimby Act). There would thus be sufficient parkland and open space in San Francisco to serve the new population associated with the implementation of the LRDP. Therefore, the potential increase in demand for recreational facilities resulting from the increase in residents under the LRDP would not represent a considerable contribution to the existing demand for public recreational facilities citywide, and thus it would not result in substantial physical deterioration of existing recreational resources or need for new or improved recreational facilities. The demand for neighborhood and regional parks or other recreational facilities that could result from potential new households and new residences citywide resulting from CPMC's combined near-term and long-term projects would be distributed citywide, without substantially affecting specific neighborhood recreational facilities above and beyond levels expected in dense urban areas, and **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide at full buildout.

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[102] Refer to Table 4.3-1, "Population Trends and ABAG Projections, San Francisco, 1990–2030," in Section 4.3, "Population, Employment, and Housing."

[103] This calculation uses the current acres of parkland in San Francisco (approximately 5,848 acres) divided by the projected 2030 population of 922,600 = 0.0063. This assumption is conservative in that it is unlikely that there would be no additional development of parkland in the city by 2015

IMPACT RE-2 *The project would not include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment. (Significance Criterion 10c)*

Levels of significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*
- *California Campus (negative demand offsets part of systemwide demand from Cathedral Hill): Less than significant*
- *Combined local impacts (near term and long term): Less than significant*
- *Citywide (near term and long term): Less than significant*
- *CPMC LRDP projects at full buildout (2030): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

The CPMC LRDP would not require the construction of new recreational facilities or the expansion of existing facilities in San Francisco. CPMC's existing medical campuses include on-campus open space areas in the form of plazas, courtyards, and gardens. For example, the existing Terrain Park at the Davies Campus serves as a rehabilitation center for patients in a semioutdoor environment. The near-term projects under the LRDP include the addition of privately owned, publicly accessible open space at the proposed Cathedral Hill, Davies, and St. Luke's Campuses.

A privately owned, publicly accessible outdoor courtyard (approximately 6,600 sq. ft.) would be located on the podium component of the Cathedral Hill Hospital, with access from Level 5 (Figure 2-21, "Cathedral Hill Hospital—Level 5," page 2-81). The courtyard would be available for use by patients, visitors, and personnel of CPMC. Public spaces on campus surrounding the development on the proposed Cathedral Hill Campus would be composed of a series of different activity zones, recognizable by distinctive colors and finishes on the sidewalks and signage. As described above, the proposed Cathedral Hill Hospital would contain an outdoor courtyard, while the Cathedral Hill MOB would not provide any open space.[104] At the Davies Campus, a new publicly accessible

[104] Only interior renovation/conversion is proposed for the 1375 Sutter MOB.

street-level entry plaza (Figure 2-45, "Davies Campus—Proposed Site Plan," page 2-155) would be constructed immediately south of the Neuroscience Institute. The plaza would incorporate varying pavement surfaces, plantings, and trees. Along Noe Street and the eastern boundary of the Davies Campus, the widened sidewalk would also have improved hardscape, plantings, and new trees.

The main entrance to the St. Luke's Replacement Hospital would be from a central plaza area (approximately 6,000 sq. ft.) (Figure 2-59, "St. Luke's Campus—Proposed Site Plan," page 2-197). The plaza would provide CPMC personnel, patients, and visitors with access to the proposed replacement hospital at Level 1 from Cesar Chavez Street and at Level 2 from San Jose Avenue/27th Street. Near-term streetscape and landscape plans for the St. Luke's Campus are being developed as part of CPMC's community and neighborhood outreach program, and in conjunction with the City's proposed *Cesar Chavez Street Design Improvement Plan*. The St. Luke's streetscape design would also be consistent with the improvements currently being made by the City on Valencia Street. Compliance with the City's *Better Streets Plan*, which provides policies and guidelines for pedestrian facilities, would also be required as part of the streetscape at the St. Luke's Campus.

Given that on-campus open space amenities would be provided at the Cathedral Hill, Davies, and St. Luke's Campuses, it is expected that access to on-site open space would help absorb some of the campus-related daily population demand on nearby parks and recreational facilities and thus offset any potential additional demand and deterioration of neighborhood parks caused by CPMC personnel and visitors. Although CPMC personnel, and to a lesser extent patients and visitors, might use surrounding parks and recreational facilities (e.g., CPMC staff visiting local parks on their lunch breaks), the incremental increase in demand on nearby facilities associated with the proposed near-term projects (2006–2015) under the LRDP would not result in the need to expand existing recreational facilities or construct new facilities, or to cause the physical deterioration of nearby parks and open spaces. For these reasons, implementation of the proposed near-term projects would not have an adverse physical effect on the environment. **This impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, and St. Luke's Campuses in the near term.

◆ Combined Local Impacts of Near-Term Projects

By 2015, net increases in personnel of approximately 4,030, 170, and 600 people, respectively, would occur at the Cathedral Hill, Davies, and St. Luke's Campuses. Additionally, net decreases in FTE personnel of approximately 1,850 and 1,150 people, respectively, would occur at the Pacific and California Campuses (see Table 4.10-6). The average daily population at the fully operational Cathedral Hill, Davies, and St. Luke's Campuses—including CPMC personnel, patients, and visitors—is estimated at 9,570, 1,150, and 1,200 people, respectively. Although these campuses would not be fully occupied in 2015, the majority of the population increase at the Cathedral Hill would have occurred by that point. Because there would be an overall net increase of approximately 1,800 FTE personnel between 2006 and 2015, as well as an associated increase in patients, visitors, and activity within the hospital campuses, the use of nearby parks and recreational facilities is also expected to incrementally increase. As discussed in detail under Impact RE-1, beginning on page 4.10-34, it is also anticipated that access to on-campus open space would help offset increased use of nearby public facilities. For these reasons, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at any of the CPMC campuses in the near term.

◆ Citywide Impacts of Near-Term Projects

Implementing the near-term projects under the proposed LRDP would increase citywide employment and lead to an associated increase in population in San Francisco. Although the projects would indirectly introduce an estimated 1,440 new residents to San Francisco by 2015, the new residents would be spread throughout San Francisco and would not place excessive demand on a particular city park or recreational facility. The public recreational system within San Francisco could accommodate the increased demand related to the proposed near-term LRDP projects, because any increase in new residents would be dispersed throughout the city. No additional recreational facilities or expansion of existing facilities would be required to accommodate new residents associated with development under the LRDP. In the near term, the addition of new residents in the city would not have an adverse physical effect on the environment, especially because new residents would be distributed citywide. Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

Because construction at the Pacific Campus is expected to occur in the long term, proposed detailed streetscape and landscape plans for the Pacific Campus would be developed when specific development projects are proposed. Similarly, no specific streetscape or open space improvements are proposed for long-term development at Davies Campus at this time.

In the long term, the Pacific Campus would experience an increase of 1,270 FTE personnel between 2015 and 2030 because of the shifting of some outpatient functions from the California Campus to the Pacific Campus. The California Campus would have a decrease in FTE personnel that would help offset growth at Pacific Campus. At the Davies Campus, long-term development would increase the number of FTE personnel by 660 between 2015 and 2030, and the daily population of patients and visitors would also increase. The increase in daily population associated with both the Pacific and Davies Campuses could result in incremental increased use of existing neighborhood parks but would not be substantial for the reasons discussed under Impact RE-1 beginning on page 4.10-34. Visitors and patients are not expected to substantially increase their use of nearby parks, because their visits to the Pacific and Davies Campuses would be mainly focused on health care services. The use of nearby recreational spaces by CPMC personnel is expected to occur primarily during lunch breaks or before or after work and would be spread over different times of day, 7 days a week, whereas resident usage would occur more often during the evening and weekend hours.

Immediately north of the Davies Campus is Duboce Park, an approximately 4-acre public park that contains lawns, a children's playground, a basketball court, a dog park, and other space for socializing that could attract CPMC personnel. Because of its close proximity to the Davies Campus, it is likely that CPMC personnel currently frequent this park and would continue to do so in the future, particularly during lunch breaks. Because the Davies Campus has an existing open space area known as Terrain Park and would expand the on-campus open space and pedestrian amenities in the near term (refer to Figure 2-45, "Davies Campus—Proposed Site Plan," page 2-155), it is expected that some CPMC personnel would use these on-campus open space areas in addition to nearby parks, such as Duboce Park. Given that open space amenities already exist and additional amenities would be provided at the Davies Campus under the LRDP, it is expected that access to on-campus open space would not require construction of new public open space in the city or result in substantial deterioration of existing public open space. Given the large size of Duboce Park (4.3 acres) and the likelihood of varied times of use of this park by CPMC personnel, it is expected that only a fraction of daytime personnel or daily population on campus would potentially use park grounds for lunch or before or after work. The potential increase in park use is not expected to result in substantial physical deterioration of this facility or other nearby parks. For these reasons, implementation of the proposed long-term projects at the Pacific and Davies Campuses would not have an adverse physical effect on the environment. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at the Pacific and Davies Campuses in the long term.

◆ Combined Local Impacts of Long-Term Projects

Between 2015 and 2030, net increases of approximately 590, 1,270, 660, and 330 FTE personnel would occur at the Cathedral Hill, Pacific, Davies, and St. Luke's Campuses, respectively. Additionally, a net decrease of 480 FTE personnel would occur at the California Campus (see Table 4.10-6). Because there would be an overall net increase in FTE personnel of approximately 2,380 people between 2015 and 2030, as well as an associated increase in patients, visitors, and activity within the CPMC campuses, the use of nearby parks and recreational facilities is also expected to increase. It is also reasonably anticipated that only a fraction of CPMC personnel would use nearby recreational spaces at any given time because they would work different shifts. Further, the visitors and patients to CPMC campuses are not expected to substantially increase use of nearby parks, since their visits to CPMC campuses would be focused on healthcare services. Increases in local park use with LRDP buildout would not be substantial and above and beyond levels expected in dense urban areas such as San Francisco or result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered park or recreational facilities. However, it is anticipated that access to on-campus open space would help offset increased use of nearby public facilities. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required any of the CPMC campuses in the long term.

◆ Citywide Impacts of Long-Term Projects

Implementing the long-term projects under the LRDP would incrementally increase the population in San Francisco. Although the employment associated with the LRDP long-term projects would indirectly introduce an estimated 2,040 new residents between 2015 and 2030, the increase in new residents would be spread throughout San Francisco and would not place excessive demand on a particular park or open space. The public recreational system within San Francisco could accommodate the increased demand from the proposed long-term projects under the LRDP, as any increase in new residents would be dispersed throughout the city. It would not result in substantial physical deterioration of existing recreational facilities citywide or place undue pressure on certain public parks or open space. No additional recreational facilities or expansion of existing facilities would thus be required to accommodate the potential new households and new residents created under CPMC's long-term projects between 2015 and 2030 and because new residents would be distributed citywide, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide in the long term.

CPMC LRDP Projects at Full Buildout (2006–2030)

◆ Local Impacts at Buildout

By 2030, the average daily populations at the Cathedral Hill, Davies, and St. Luke's Campuses would increase relative to existing conditions by 9,570, 1,150, and 1,200 people, respectively. There would also be a net decrease in the average daily population at the Pacific Campus of 1,450 people. It is expected that by about 2020 almost all CPMC-related use of the California Campus would cease, and there would be a net decrease in the daily population at the California Campus of 3,540 people. The net decrease of average daily population at California

Campus somewhat offsets the overall LRDP daily population growth. The overall increase in average daily population at CPMC campuses systemwide by 2030 (approximately 6,930) would likely generate more visitor trips to local parks than under current conditions; however, it is expected that some people on campus would also use on-campus open space areas at each of these CPMC campuses. The proposed LRDP would provide walkways, open plazas, and landscaped areas for personnel, patients, and visitors. Visitors and patients are not expected to substantially increase utilization of nearby parks, because their visits to CPMC campuses would be for specific health care needs. Any increase in demand for recreational facilities resulting from average daily population increases at the campuses would not be substantial since the focus of these visits to CPMC campuses is healthcare, and employees would use nearby parks at different times of the day due to varying work shifts or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment. Use of nearby parks by CPMC personnel would therefore be spread over different times of day, 7 days a week, and would not be concentrated at one time of day. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at any of the CPMC campuses at full buildout.

◆ Citywide Impacts at Buildout

The combined impact of implementing near-term and long-term projects under the LRDP would increase employment at CPMC by a net total of approximately 4,170 FTE personnel. Assuming that 49% of CPMC personnel would choose to live and work in San Francisco, this would indirectly add an estimated 1,490 households and 3,480 new residents to San Francisco between 2006 and 2030 (see Table 4.10-6). Although the LRDP projects would indirectly introduce an estimated 3,480 new residents to San Francisco by 2030, the increase in residents would be spread throughout San Francisco and would not place excessive demand on any particular local park or open space in the context of citywide demand for recreational facilities. The public recreational system within San Francisco could accommodate increased demand from the proposed near-term and long-term projects combined, because the increase in LRDP-related residents would not be a substantial increase for a dense urban area such as San Francisco and the new residents would be dispersed throughout the city. For these reasons, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide at full buildout.

IMPACT RE-3 *The project would not adversely affect existing recreational opportunities. (Significance Criterion 10d)*

Levels of significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*
- *California Campus (negative demand offsets part of systemwide demand from Cathedral Hill): Less than significant*
- *Combined local impacts (near term and long term): Less than significant*
- *Citywide (near term and long term): Less than significant*
- *CPMC LRDP projects at full buildout (2030): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

The CPMC LRDP does not include a housing component and would not introduce any new permanent residences on any of the campuses. Projected use of citywide parklands by CPMC personnel, and to a lesser extent by patients and visitors to the campus, would mostly be spread over different times of day, 7 days a week, whereas local resident usage would occur more often during the evening and weekend hours. Any increase in use by patients and visitors would be incidental (since the focus of their visits to CPMC campuses is healthcare) and result in only incremental use of nearby recreational facilities and open space. Although some of these LRDP-related average daily population (personnel, patients, and visitors) might visit citywide parklands, such usage would not be substantial in the context of citywide demand on recreational facilities and is not expected to adversely affect existing recreational opportunities areawide. Implementing the proposed CPMC LRDP would not substantially increase demand for or use of existing neighborhood parks, or citywide facilities, such as Golden Gate Park, in a manner that would require the construction of new or expansion of existing recreational resources. **This impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, and St. Luke's Campuses in the near term.

◆ Combined Local Impacts of Near-Term Projects

By 2015, net increases of approximately 4,030, 170, and 600 FTE personnel, respectively, would occur at the Cathedral Hill, Davies, and St. Luke's Campuses. Additionally, net decreases of approximately 1,850 and 1,150 FTE personnel, respectively, would occur at the Pacific and California Campuses (see Table 4.11-2). The average daily populations at the Cathedral Hill, Davis, and St. Luke's Campuses at full operation—including CPMC personnel, patients, and visitors—are estimated to be 9,570, 1,150, and 1,200 people, respectively. Although these campuses would not be fully occupied in 2015, the majority of the average daily population increase at the Cathedral Hill would have occurred by that point. There would be an overall net increase of approximately 1,800 FTE personnel at CPMC campuses systemwidebetween 2006 and 2015, as well as an associated increase in patients, visitors, and activity on the hospital campuses. This increase would occur over time, and as discussed in detail under Impacts RE-1 beginning on page 4.10-34 and RE-2 beginning on page 4.10-42, would be accommodated by the citywide open space and existing public recreational system. The LRDP would not substantially affect local nearby parks because LRDP-related use would be incremental and spread over various times of day. The demand on local nearby parks would therefore not be substantial in the context of their use currently and given the dense urban nature of the campus areas. For the same reasons described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at any of the CPMC campuses in the near term.

◆ Citywide Impacts of Near-Term Projects

There are no existing public open spaces or recreation areas at any of the existing CPMC campuses or at the properties composing the proposed Cathedral Hill Campus. All new construction and renovation at these campuses would occur entirely within the existing campus footprints. The campuses are within and surrounded by densely populated neighborhoods and have at least five public parks and open space areas within reasonable walking distance of each campus. Multiple neighborhood parks and playgrounds, community gardens, landscaped walkways, recreation centers, and open space areas are conveniently located around each CPMC campus and would likely accommodate any increased demand for usable recreational facilities and parkland, related to the proposed LRDP.

As previously mentioned, near-term projects under the LRDP would introduce approximately 1,440 new residents to San Francisco between 2006 and 2015. Because the new residents are expected to be dispersed throughout San Francisco, any increase in demand for existing neighborhood and regional parks or other recreational facilities would also be similarly distributed citywide and would not place excessive demand on any specific neighborhood or park. Using ABAG population projections for 2015, implementing the near-term projects under the LRDP would result in a parkland-to-population ratio of about 7.1 acres to 1,000 residents, which is the same ratio as in 2008. The parkland-to-population ratio would also remain above the ratio for park use noted in the General Plan (5.5 acres per 1,000 residents), indicating that there would be sufficient parkland and public open space to serve the new citywide residential population associated with implementation of the LRDP. Therefore, the demand on recreational facilities resulting from potential new households and new residents resulting from development of CPMC's near-term LRDP projects would not substantially impact existing recreational opportunities citywide. For these reasons, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

The LRDP does not include a housing component and would not introduce any new permanent residences on any of the campus sites. Projected use of citywide parklands by CPMC personnel working different shifts, and to a lesser extent by patients and visitors, would mostly occur spread over different times of day, 7 days a week, whereas resident usage would occur more often during the evening and weekend hours. Any increase in use by patients and visitors would be incidental since patients' and visitors' visits to CPMC campuses are focused on healthcare and result in only incremental use of nearby recreational facilities and open space. Although some of these people might visit citywide parklands, such usage is not expected to adversely affect existing recreational opportunities areawide. Implementing the proposed LRDP would not substantially increase demand for or use of neighborhood parks or citywide facilities (such as Golden Gate Park) in a manner that would adversely affect existing recreational opportunities. For the same reasons as discussed above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific and Davies Campuses in the long term.

◆ Combined Local Impacts of Long-Term Projects

Between 2015 and 2030, net increases of approximately 590, 1,270, 660, and 330 FTE personnel would occur at the Cathedral Hill, Pacific, Davies, and St. Luke's Campuses, respectively. Additionally, a net decrease of 480 personnel would occur at the California Campus (see Table 4.10-6). There would be an overall net increase of approximately 2,380 FTE personnel between 2015 and 2030, as well as an associated increase in patients, visitors, and activity on the CPMC campuses; however, this increase would occur over time and would be accommodated by the existing public recreational system. For the same reasons described above, **this impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at any of the CPMC campuses in the long term.

◆ Citywide Impacts of Long-Term Projects

Using ABAG population projections for 2030, implementing the long-term projects under the LRDP would result in a parkland-to-population ratio of 6.3 acres per 1,000 residents. The ratio of 6.3 acres per 1,000 residents would be less than the 2008 ratio of 7.1, but would be higher than the ratio of 5.5 acres per 1,000 residents identified in the General Plan. As discussed on page 4.10-30, although San Francisco has not established a parkland-to-population ratio, the LRDP-related ratio would still be higher than the 3 to 5 acres per 1,000 residents ratio considered an acceptable standard by state regulations (Quimby Act).This indicates that there would be sufficient parkland and open space to adequately serve the potential new households and new residences created under CPMC's long-term projects associated with the LRDP. This long-term impact is thus similar to the near-term impact identified above for all campuses. Implementing the long-term projects under the LRDP would not adversely affect existing recreational opportunities citywide. Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide in the long term.

CPMC LRDP Projects at Full Buildout (2006–2030)

◆ Local Impacts at Buildout

By 2030, the average daily populations (personnel, patients, and visitors) at the Cathedral Hill, Davies, and St. Luke's Campuses would increase relative to existing conditions (2006) by approximately 9,570, 1,150, and 1,200 people, respectively. There would be a net decrease in the average daily population at the Pacific Campus of 1,450 people. It is expected that by about 2020 almost all CPMC-related use of the California Campus would cease, and there would be a net decrease in the average daily population at the California Campus of 3,540 people. The overall increase in the average daily population at CPMC campuses systemwide by 2030 would likely generate more visitor trips to local parks near the campuses than there are under 2006 existing conditions. However, the increase in visits to nearby parks and recreational facilities near Cathedral Hill, Davies, and St. Luke's Campuses would be offset by decreases in daily populations at the California and Pacific Campuses. It is also anticipated that a fraction of CPMC personnel would use nearby parks at any one time (due to working various shifts) and patients and visitors would not be substantially using nearby parks because the focus of their visit to CPMC campuses is healthcare. Any increase in park use would not be substantial or result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered park or recreational facilities. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at any of the CPMC campuses at full buildout.

◆ Citywide Impacts at Buildout

The combined impact of implementing near-term and long-term projects under the LRDP would increase CPMC employment by a net total of approximately 4,170 FTE personnel. Assuming that 49% of CPMC personnel would choose to live and work in San Francisco, an estimated 1,490 households and 3,480 new residents would be added to San Francisco by 2030 due to the LRDP buildout (see Table 4.10-6). For the same reasons as described above, this combined impact would not adversely affect existing recreational opportunities. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required citywide at full buildout.

4.10.6 Cumulative Impacts

The LRDP, when combined with other reasonably foreseeable projects, is not expected to result in cumulative impacts with respect to the use of existing neighborhood and regional parks or other recreational facilities. Compliance of cumulative projects with open space requirements in the San Francisco Planning Code would ensure that **cumulative impacts on recreation resources would be less than significant**.

The proposed CPMC LRDP would not induce substantial citywide population or employment growth. As summarized in Section 4.3, “Population, Employment, and Housing,” implementation of the LRDP would result in increases in CPMC personnel of approximately 1,800 net new FTE personnel from 2006 to 2015 and 4,170 net new personnel from 2006 to 2030. The growth in personnel would occur gradually, with the most rapid increase occurring in 2015 as the proposed Cathedral Hill Campus would become operational. The increase in CPMC FTE personnel resulting from the proposed LRDP between 2006 and 2030 would result in 3,480 new San Francisco residents and 1,490 new San Francisco households, assuming that 49% of CPMC personnel would choose to live and work in San Francisco. The projected increase in residents and households with the LRDP accounts for 3% of the total projected increase in San Francisco residents and households as estimated by ABAG from 2006 to 2030. The CPMC LRDP–related projected increase in residents and households is also accounting for citywide growth projections.

Implementing the LRDP may result in an increase in demand for parks, open space, and recreational facilities in the city; however, given the proximity of each campus to a variety of existing recreational resources, it is appropriate to assume that any increase in such demand would not be substantial and would be accommodated by the existing park and recreational resources in the area. The new residential growth in the city related to development of CPMC LRDP and its associated employment, would also be distributed citywide, accommodated by the existing citywide open space and recreational facilities. The demand on these resources would not be above and beyond the demand expected in dense urban areas.

In addition, these open space and recreational services go through an annual budgeting process during which citywide priorities are established and service levels monitored, allowing for adjustment where needed.[105] CPMC's contribution to a cumulative impact on citywide recreational resources would not be considerable. Therefore, implementation of the cumulative projects, in combination with the proposed CPMC LRDP, would not result in a substantial adverse physical impact associated with the provision of recreational services to each CPMC campus, in the area or citywide.

[105] San Francisco Planning Department. 2008. *San Francisco General Hospital Seismic Compliance Hospital Replacement Program Final Environmental Impact Report,* Volume I. San Francisco, CA. Page 307.

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4.11 PUBLIC SERVICES

This section describes existing public services and facilities in the vicinity of each of the five proposed CPMC campuses. This analysis also discusses the impacts of CPMC's *Long Range Development Plan* (LRDP) on the delivery of public services, specifically whether implementing the LRDP would require new or physically altered public-service facilities, potentially resulting in adverse physical impacts on the environment. The analysis reviews fire protection and emergency medical services, police protection services, and schools. Potential impacts and mitigation measures are identified, as necessary, and cumulative impacts are considered. Potential impacts on parks and recreation are addressed in Section 4.9, "Wind and Shadow," and Section 4.10, "Recreation."

4.11.1 ENVIRONMENTAL SETTING

FIRE PROTECTION AND EMERGENCY MEDICAL SERVICES

Overview of Services

The San Francisco Fire Department (SFFD) provides fire suppression services and emergency medical services throughout the city. SFFD operates out of 46 fire stations and is headquartered at 698 Second Street, in the South of Market (SOMA) neighborhood of San Francisco. SFFD operates 42 engines, 19 trucks, multiple ambulances, two heavy-rescue squads, two fireboats, and multiple special-purpose units. Emergency response operations include fire suppression, tactical rescues, emergency medical care, fire prevention, arson investigations, responses to natural disasters, responses to mass-casualty and hazardous-materials incidents, and fire and emergency medical services (EMS) dispatch supervision.[1, 2] SFFD has a current staff of 1,619 uniformed members and 74 civilians. The daily operational strength is approximately 315 staff members.[3] Based on San Francisco's estimated 2006 population of 813,000 residents,[4] SFFD's staffing levels on a per capita basis are 2.6 staff members per 1,000 residents. SFFD has three divisions: the Airport Division (serving San Francisco International Airport) and Divisions 2 and 3 (serving the rest of San Francisco). Division 2 is divided into four battalions and extends from downtown San Francisco and the Financial District to the city's northwestern boundaries. Division 3, divided into five battalions, comprises the SOMA neighborhood and runs to the southwestern city limits.[5] The roles and responsibilities of the members of Divisions 2 and 3 are to establish command and control at emergency scenes, conduct fire suppression activities, provide emergency medical services, manage disaster operations, mitigate the effects of hazardous-materials spills, respond to incidents involving weapons of mass destruction, and effectively

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1 San Francisco Fire Department. 2009. About Us. Available: http://38.106.4.187/index.aspx?page=164. Accessed May 2009.

2 San Francisco Fire Department. 2009. Deputy Chief of Operations: About Us. Available: http://38.106.4.187/index.aspx?page=20. Accessed May 2009.

3 Zanoff, Andy. Captain–Administration Division. San Francisco Fire Department, San Francisco, CA. October 7, 2009—e-mail message to Stephanie Klock of AECOM regarding staffing levels.

4 California Department of Finance. 2005 (January 1). *Demographic Research Unit, Table 2: E-5 City/County Population and Housing* Estimates. Sacramento, CA.

5 San Francisco Fire Department. 2009. About Us. Available: http://38.106.4.187/index.aspx?page=164. Accessed May 2009.

and rapidly bring closure to mass-casualty incidents. Fire prevention responsibilities consist of preplanning and inspections of buildings, fire protection devices, and water supplies.[6] San Francisco ensures fire safety and emergency accessibility within new and existing developments through provisions of its building and fire codes.

San Francisco Fire Department Water Supply

The San Francisco Water Department supplies water for the city's domestic and industrial water needs as well as for fire service. Fire service requirements include not only the water supplied to SFFD's low-pressure hydrants, but also the water supplied to the storage reservoir and tanks of SFFD's High Pressure System. This system, also known as the Auxiliary Water Supply System, is a separate and distinct water supply for fire protection use only. The system was built in response to the 1906 earthquake and fire, solely for the purpose of firefighting, and has special features designed to protect the city in emergency situations. Additionally, a separate backup water supply is provided in the form of underground cisterns strategically located throughout the city. SFFD's cistern system consists of 172 cisterns with a total storage capacity of approximately 11 million gallons.[7]

San Francisco Fire Department Response Times and Emergency Medical Services

Citywide Overview

According to SFFD, any single-alarm response[8] brings the four closest available fire engines, the two closest available fire trucks, and the closest available heavy-rescue squad. Each vehicle is typically staffed by at least one officer and three to four firefighters. Some of the firefighters may be licensed paramedics, but that is not always the case. An ambulance carrying two paramedics and one paramedic rescue captain would also be dispatched to the scene.[9] This response scenario is the *initial* dispatch (first response) to any confirmed working fire, regardless of the size of the fire. If the magnitude of the fire is found to require more resources, a second-alarm response (i.e., more fire trucks and/or engines) would be dispatched to the scene, as would be the case in a high-rise building.[10] The responding units are from the nearest and available stations (assuming that all engines and trucks are available and not responding to calls somewhere else). Considering the fact that four engines respond to a fire, a minimum of four stations would receive a dispatch for a single fire incident. Chief officers from various stations may be dispatched as well.[11] All emergency (911) and nonemergency calls for police, fire, and medical services

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[6] Ibid.

[7] San Francisco Fire Department. 2009. Water Supply. Available: http://www.sf-fire.org/index.aspx?page=140. Accessed May 2009.

[8] A single-alarm response is defined as the initial response to a confirmed working fire or reports of smoke. Talmadge, Mindy. Public information officer. San Francisco Fire Department, San Francisco, CA. October 7, 2009—telephone conversation with Stephanie Klock of AECOM regarding response scenarios for confirmed fires.

[9] Talmadge, Mindy. Public information officer. San Francisco Fire Department, San Francisco, CA. May 21, 2009—e-mail message to Stephanie Klock of AECOM regarding response vehicles.

[10] Talmadge, Mindy. Public information officer. San Francisco Fire Department, San Francisco, CA. October 7, 2009—telephone conversation with Stephanie Klock of AECOM regarding response scenarios for confirmed fires.

[11] Ibid.

are received by San Francisco's Emergency Communications Dispatch Center located at 1011 Turk Street.[12] The 911 dispatch center receives approximately 2,500 calls per day; of these calls, 80% require police services, 14% involve EMS, and the remaining 6% require fire protection.[13] San Francisco's objective is to get professional help to the scene of high-priority medical emergencies within 6½ minutes of receiving a 911 call, 90% of the time. The 6½-minute goal includes 2 minutes for dispatch and 4½ minutes for the fire engine or ambulance to arrive at the curb. This standard was adopted in 2004 by the San Francisco Emergency Medical Services Agency under the Department of Public Health. The state's goal for emergency response to a high-priority call in an urban area is 5 minutes.[14] According to SFFD personnel, the department's emergency response time is 4 minutes and 53 seconds 90% of the time,[15] which indicates that SFFD is meeting both the city and state standards.

The fire protection services available to each of the CPMC campuses are described below.

Cathedral Hill Campus

The properties comprising the proposed Cathedral Hill Campus are located within the Division 3 service area, along the edges of San Francisco's Pacific Heights and Nob Hill neighborhoods. The proposed Cathedral Hill Campus would be in the First Alarm area[16] for Station 3 (Battalion 2), located at 1067 Post Street, approximately 1½ blocks east of the site of the proposed campus. Station 3 houses one aerial ladder truck and one fire engine. Staffing includes two officers and seven firefighters for a total of nine staff members.[17]

Pacific Campus

The Pacific Campus is located within the Division 2 service area in San Francisco's Pacific Heights neighborhood. The Pacific Campus is in the First Alarm area for Station 38 (Battalion 4), located at 2150 California Street, two blocks south of the campus. Fire Station 38 houses one fire engine and a mobile command vehicle. Staffing includes one battalion chief, one officer, and three firefighters for a total of five staff members.[18]

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[12] Tully, Dewayne. 2009. Writer/PIO assistant. Public Affairs Office, San Francisco Police Department, San Francisco, CA. May 28, 2009—e-mail message to Stephanie Klock of AECOM regarding emergency dispatch.

[13] San Francisco Department of Emergency Management. 2009. About Us. Available: http://www.sfdem.org/index.aspx?page=5. Accessed May 2009.

[14] Doyle, J. 2009. 911 Help Arriving Sooner in San Francisco. *San Francisco Chronicle,* January 2, 2009. Available: http://www.firerescue1.com/fire-products/communications/dispatch-equipment/articles/445690-911-help-arriving-sooner-in-San-Francisco/. Accessed May 2009.

[15] Zanoff, Andy. Captain–Administration Division. San Francisco Fire Department, San Francisco, CA. September 29, 2009—e-mail message to Stephanie Klock of AECOM regarding response times and other fire-related issues.

[16] The first alarm is the geographic area in which a station is responsible for arriving first in the case of an emergency call.

[17] Talmadge, Mindy. Public information officer. San Francisco Fire Department, San Francisco, CA. May 21, 2009—e-mail to Stephanie Klock of AECOM regarding staffing levels and equipment.

[18] Ibid.

California Campus

The California Campus is located within the Division 2 service area in San Francisco's Presidio Heights neighborhood. The California Campus is in the First Alarm area for Station 10 (Battalion 4), located at 655 Presidio Avenue, approximately six blocks east of the campus. Station 10 houses one aerial ladder truck, one fire engine, and a chemical, biological, radiological, nuclear, high-yield explosives equipment (CBRNE) vehicle. Staffing includes two officers and seven firefighters for a total of nine staff members.[19]

Davies Campus

The Davies Campus is located within the Division 3 service area in San Francisco's Castro/Upper Market neighborhood in the Duboce Triangle area. The Davies Campus is in the First Alarm area for Station 6 (Battalion 2) located at 135 Sanchez Street, approximately 1½ blocks southeast of the campus. Station 6 houses one aerial ladder truck, one fire engine, and a hazmat decontamination unit. Staffing includes two officers and seven firefighters for a total of nine staff members.[20]

St. Luke's Campus

The St. Luke's Campus is located within the Division 3 service area along the edges of San Francisco's Mission and Bernal Heights neighborhoods. The St. Luke's Campus is in the First Alarm area for Station 11 (Battalion 6), located at 3880 26th Street, approximately seven blocks west of the campus. Station 11 houses an aerial ladder truck, one fire engine, and an SUV that carries advanced life support equipment. Staffing at Station 11 includes one battalion chief, two officers, and seven firefighters for a total of 10 staff members.[21]

POLICE PROTECTION SERVICES

Information presented in this section is based on a study done in 2008 for the City and County of San Francisco (City) titled *San Francisco Police Department District Station Boundaries Analysis*,[22] which provides an independent review of the San Francisco Police Department's (SFPD's) operations, structure, and personnel resources.

SFPD provides police protection services to San Francisco. SFPD is headquartered at 850 Bryant Street, in the SOMA neighborhood. SFPD divides the city into two areas—Metro and Golden Gate—which are each divided into five districts, totaling 10 district stations. The Metro Division encompasses downtown San Francisco, while

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[19] Ibid.

[20] Ibid.

[21] Ibid.

[22] The Public Safety Strategies Group. 2008 (May 13). *San Francisco Police Department District Station Boundaries Analysis Final Report.* Prepared for the City and County of San Francisco. Available: http://sf-police.org/Modules/ShowDocument.aspx?documentid=14683. Accessed May 2009.

the Golden Gate Division includes San Francisco's outer areas and neighborhoods.[23, 24] In 2008, SFPD had 2,449 budgeted positions for uniformed officers citywide; of these budgeted positions, 2,374 positions, or approximately 97%, were filled.[25] Based on San Francisco's estimated 2006 population of 813,000[26] residents, SFPD's staffing levels on a per capita basis were 2.9 staff members per 1,000 residents. As indicated in the district station facility review, crime in San Francisco is not associated with increases in population per se, or with increased commercial, entertainment, or office uses. The city's crime levels were stable during the 2002–2007 period, along with a stable number of police officers. New ways of policing are required in longstanding crime areas.[27]

The site of the proposed Cathedral Hill Campus and the existing Pacific Campus are located within the service area of the Northern District Station. The California and Davies Campuses are served by the Richmond and Park District Stations, respectively. The St. Luke's Campus is located along the border of two police districts with service from both the Mission and Ingleside District Stations. Authorized staffing at each district station includes one captain, four lieutenants, and 16 sergeants. The number of patrol officers varies in relation to population and crime statistics within the district.[28]

Capacities at District Stations

According to the district station facility review conducted by the Public Safety Strategies Group, space is limited at almost every district station in San Francisco. Overall findings revealed that station facilities are small, locker rooms do not provide adequate space, juvenile facilities are lacking, inadequate interview and report writing rooms compromise productivity, and facilities present safety and security concerns.[29] Although the Northern, Richmond, Park, Mission, and Ingleside Stations are newer or updated, they do not offer surge capacity[30] for the future needs of SFPD.[31] Nevertheless, the facilities that would service the CPMC campuses under the proposed LRDP were all found to be structurally sound and considered adequate for current needs, with the exception of the Mission Station, which is already at capacity.[32] There are currently no plans for improvements to any of the 10

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[23] San Francisco Police Department. 2009. Metro Division. Available: http://sf-police.org/index.aspx?page=24. Accessed May 2009.

[24] San Francisco Police Department. 2009. Golden Gate Division. Available: http://sf-police.org/index.aspx?page=25. Accessed February 2010.

[25] San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Page III.O-5.

[26] California Department of Finance. 2005 (January 1). *Demographic Research Unit, Table 2: E-5 City/County Population and Housing* Estimates*.* Sacramento, CA.

[27] The Public Safety Strategies Group. 2008 (May 13). *San Francisco Police Department District Station Boundaries Analysis Final Report*. Prepared for the City and County of San Francisco. Available: http://sf-police.org/Modules/ShowDocument.aspx?documentid=14683. Page 20.

[28] Ibid., page D1.

[29] Ibid., page 27.

[30] "Surge capacity" refers to a station's ability to expand beyond normal services to meet increased demand.

[31] The Public Safety Strategies Group. 2008 (May 13*). San Francisco Police Department District Station Boundaries Analysis Final Report.* Prepared for the City and County of San Francisco. Available: http://sf-police.org/Modules/ShowDocument.aspx?documentid=14683. Page 20.

[32] Ibid.

district stations because major improvements have already been made to most of the stations. There are, however, long-range plans for a new police headquarters in Mission Bay.[33] Currently, the City is determining whether to redesign SFPD's boundaries from 10 districts to five to improve police services and maximize the use of resources.

San Francisco Police Department Emergency Response Times

The citywide response time to calls for police services generally reflects the perceived seriousness of the call. All calls are prioritized into three categories—A, B, and C—with type A calls reflecting those of highest priority. Priority A calls are defined as "life-threatening emergencies,"[34] otherwise known as Code 3 calls, and include situations such as a homicide or an officer down. Priority B calls are defined as involving "potential for harm to life and/or property"[35] but are not considered emergency situations, and include violations such as a burglary. Priority C calls are the lowest priority and are categorized as "crime committed with no threat to life or property/suspect left crime scene"[36] and typically consist of quality-of-life violations, found property, or an auto burglary with no suspect.[37]

In the performance measures for SFPD set out as part of the City's 2008–2009 budget plan, the department established target response times for 2008–2009. Target response times are 4.4 minutes for Priority A calls, 8.3 minutes for Priority B calls, and 10.8 minutes for Priority C calls.[38] Table 4.11-1, "Average District Response Time (2007), in Minutes" (page 4.11-7), shows the average response times per district, measured from the time the call was dispatched until the unit arrived. In 2007, SFPD met the 2008–2009 target response times for Priority A and C calls, but failed to meet the Priority B target response time of 8.3 minutes. For a complete review of response times by district station, refer to the individual campus discussions.

Cathedral Hill Campus

The site of the proposed Cathedral Hill Campus is located within the jurisdictional boundary of the Northern District Station and within SFPD's Metro Division. Located at 1125 Fillmore Street, the Northern District Station is approximately 1.0 mile southwest of the Cathedral Hill Campus site. The Northern District includes the Pacific

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[33] Tully, Dewayne. Writer/PIO assistant. Public Affairs Office, San Francisco Police Department, San Francisco, CA. May 28, 2009—e-mail message to Stephanie Klock of AECOM regarding district stations.

[34] Police Executive Research Forum. 2008 (December). *Organization Assessment of the San Francisco Police Department: A Technical Report*. San Francisco, CA. Page 86.

[35] Ibid.

[36] Ibid.

[37] Tully, Dewayne. 2009. Writer/PIO assistant. Public Affairs Office, San Francisco Police Department, San Francisco, CA. May 28, 2009—e-mail message to Stephanie Klock of AECOM regarding response time to service calls.

[38] Police Executive Research Forum. 2008 (December). *Organization Assessment of the San Francisco Police Department: A Technical Report*. San Francisco, CA. Page 87.

Table 4.11-1
Average District Response Time (2007), in Minutes

District	Priority A Calls	Priority B Calls	Priority C Calls
Northern	4.6	12.1	14.3
Park	1.8	4.7	6.0
Richmond	2.0	5.6	5.8
Ingleside	3.8	10.0	11.3
Mission	4.5	12.0	16.0
Total Average of SFPD's 10 District Stations	3.43	9.8	10.68

Note: SFPD = San Francisco Police Department
Source: 2007 San Francisco Computer-Aided Dispatch data

Heights, Civic Center, Western Addition, Cow Hollow, Japantown, and Marina neighborhoods.[39] The Northern District's service area covers approximately 6.1% of the land mass in the city and has an estimated service population of 82,348. Staffing at the Northern Station includes 138 sworn officers and three civilian staff for a total of 141 staff members.[40] Approximately 72 officers patrol the service area on a three-shift basis.[41, 42] The Northern Station is considered a newer station with adequate support for its current staff, but its capacity for growth is limited. The facility has potential for structural reengineering to accommodate a larger facility.[43] In 2007, the Northern District did not meet any of the priority call standards, the station missed the Priority A target response time by 0.2 second.

Pacific Campus

The Pacific Campus is located in SFPD's Metro Division and is currently served by the Northern District Station, which is described above for the Cathedral Hill Campus. The Northern District Station is approximately 0.9 mile south of the Pacific Campus. As stated above, the Northern District did not meet the priority call standards in 2007.

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[39] The Public Safety Strategies Group. 2008 (May 13*). San Francisco Police Department District Station Boundaries Analysis Final Report.* Prepared for the City and County of San Francisco. Available: http://sf-police.org/Modules/ShowDocument.aspx?documentid=14683. Pages D5–D6.

[40] Ibid.

[41] Tully, Dewayne. Writer/PIO assistant. Public Affairs Office, San Francisco Police Department, San Francisco, CA. May 28, 2009—e-mail to Stephanie Klock of AECOM regarding staffing levels and emergency response.

[42] San Francisco patrol officers work 10-hour fixed shifts. Police Executive Research Forum. 2008 (December). *Organization Assessment of the San Francisco Police Department: A Technical Report*. San Francisco, CA. Page 93.

[43] The Public Safety Strategies Group. 2008 (May 13*). San Francisco Police Department District Station Boundaries Analysis Final Report.* Prepared for the City and County of San Francisco. Available: http://sf-police.org/Modules/ShowDocument.aspx?documentid=14683. Page 20.

California Campus

The California Campus, located within SFPD's Golden Gate Division, is served by the Richmond District Station. The Richmond Station is located at 461 Sixth Avenue, approximately 0.9 mile southwest of the California Campus. With an estimated service population of 93,963, the Richmond Station's service area covers 12.7% of the land mass in the city and includes the Richmond, Presidio Heights, Laurel Heights, and Seacliff neighborhoods as well as Golden Gate Park. Staffing at the Richmond Station includes 86 sworn officers and two civilians for a total of 88 staff members.[44] Approximately 29 officers patrol the service area on a three-shift basis. The Richmond Station is a remodeled facility that is capable of expanding.[45] In 2007, the Richmond Station met the target response times for all three priority call standards and had SFPD's second fastest response time for Priority A calls.

Davies Campus

The Davies Campus falls within the jurisdictional boundary of the Park District Station located within SFPD's Golden Gate Division. With an estimated service population of 59,572, this service area covers 6.7% of the land mass in the city and includes the Haight-Ashbury, North of Panhandle, West of Twin Peaks, and Western Addition neighborhoods and portions of the Castro. Park Station is located at 1899 Waller Street, approximately 1.1 miles west of the Davies Campus. Staffing at the Park Station includes 90 sworn officers and four civilian staff for a total of 94 staff members. Approximately 38 officers patrol the service area on a three-shift basis. The Park Station is a remodeled facility with adequate support for current staffing. In 2007, the Park Station met the targeted response times for all three priority call standards and had the fastest response time for Priority A calls.

St. Luke's Campus

The St. Luke's Campus is situated along the border of two police districts—the Mission District and the Ingleside District. Cesar Chavez Street falls within the Mission Station's service area and serves as the border between the Mission and Ingleside Police Districts.[46] Because the St. Luke's Campus is located along Cesar Chavez Street, SFPD's Mission Station would be the primary responder to this campus.[47] Located at 630 Valencia Street, the Mission Station is approximately 1.3 miles north of the campus. The Mission District Station, located within SFPD's Metro Division, serves an estimated service population of 83,235 and its service area covers 6.4% of the land mass in the city. Staffing at the Mission Station includes 138 sworn officers and three civilians, for a total of

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[44] The Public Safety Strategies Group. 2008 (May 13*). San Francisco Police Department District Station Boundaries Analysis Final Report.* Prepared for the City and County of San Francisco. Available: http://sf-police.org/Modules/ShowDocument.aspx?documentid=14683. Pages D6–D7.

[45] Ibid., page 20.

[46] Ingleside Station is responsible for the hospital's campus beyond Cesar Chavez Street, and also the area of Valencia Street extending past the Cesar Chavez junction. Melendez, Mirna. Captain's clerk. San Francisco Police Department, San Francisco, CA. April 23, 2009—e-mail message to Stephanie Klock of AECOM regarding police response in the vicinity of the St. Luke's Campus.

[47] Lee, Franklin. Lieutenant. Ingleside Police Station, San Francisco Police Department, San Francisco, CA. October 1, 2009—e-mail message to Stephanie Klock of AECOM regarding St. Luke's impact on police services.

141 staff members. Approximately 70 officers patrol the service area on a three-shift basis. Although the Mission Station is currently experiencing capacity issues, it is a newer facility with structural potential for growth.[48] In 2007, the Mission District failed to meet any of the priority call standards, but it missed the Priority A target response time by 0.1 second.

SFPD's Ingleside Station is situated within SFPD's Golden Gate Division. Located at 1 John V. Young Lane, the Ingleside Station is situated approximately 2.2 miles southwest of the St. Luke's Campus. With an estimated service population of 132,328, the Ingleside Station's service area covers 15.4% of the land mass in San Francisco and includes the Diamond Heights, Bernal Hill, Glen Park, Mission Terrace, Excelsior, Crocker Amazon, and Visitacion Valley neighborhoods. Staff at the Ingleside Station includes 131 sworn officers and two civilians, for a total of 133 staff members. Approximately 56 officers patrol the service area on a three-shift basis. Ingleside Station is a large facility that is capable of expanding. In 2007, the Ingleside Station met the target response time for Priority A calls, but it failed to meet the Priority B and C targets.

On-Campus Security at California Pacific Medical Center Campuses

In addition to police protection services provided by SFPD, CPMC provides on-site security at all four existing campuses through its contract with a private security company. The on-site contract security staff provides 24-hour service 7 days a week. Duties include controlling access, identifying visitors and personnel, proactively preventing the loss of personal or company property (i.e., through the use of surveillance and communication systems), and providing for the security and physical safety of all who are on the property. Further duties include responding to alarms, emergency codes, and alerts and cooperating with law enforcement officials in matters that extend beyond hospital boundaries. Security officers are not law enforcement officers, and therefore, their primary responsibility is to observe and report. Security officers are not authorized to wear or use any weapon while on duty.

PUBLIC SCHOOLS

The San Francisco Unified School District (SFUSD) oversees the public school system in San Francisco (K–12). SFUSD is composed of 37 preschools and 104 schools serving various grade levels (K–5, K–8, and 9–12). Based on data for the 2008–2009 school year, approximately 56,000 students are currently attending public schools in

[48] The Public Safety Strategies Group. 2008 (May 13). *San Francisco Police Department District Station Boundaries Analysis Final Report.* Prepared for the City and County of San Francisco. Available: http://sf-police.org/Modules/ShowDocument.aspx?documentid=14683. Page 20.

San Francisco. It is estimated that another 20,000 students, 26% of the total enrollment, attend local private schools.[49]

In the last decade, overall SFUSD enrollment has gradually declined. The decline stopped in the fall of 2008, when kindergarten enrollments began to increase, reflecting a growth in birth rates 5 years earlier. SFUSD projections indicate that elementary enrollment will continue to grow.[50] The number of elementary school students will eventually rise from 25,000 students in 2008 to 27,600 in 2013, representing an 11% increase in 5 years. After a slight decline in 2009 and 2010, middle school enrollment will again increase. However, in 2013 it will still stand below current enrollment (at 11,640 compared with 11,816 in 2008). High school enrollment will experience a continued decline over the next 5 years, from 19,696 students in 2008 to 18,396 in 2013. Districtwide enrollment as of fall 2008 was 55,272. SFUSD is adopting a new student assignment policy to manage the projected growth in students.

LIBRARIES

The San Francisco Public Library (SFPL) operates the Main Library at the Civic Center and 28 neighborhood branches distributed throughout San Francisco, providing information in books, other print and nonprint formats, or electronic form.[51] The closest branch library to the proposed Cathedral Hill Campus is the Main Library branch, located 0.7 mile to the northwest. There is at least one library branch within one-half mile of the Pacific, Davies, and St. Luke's Campuses. The nearest branch library to the California Campus is the Presidio Branch Library, which is located 0.6 mile to the east and is currently closed. The second nearest branch to the California Campus that is currently open, is the Richmond Branch Library, located 0.9 mile to the southwest.[52]

LIBRARY PRESERVATION FUND

In 1994, San Francisco voters passed Proposition E, a charter amendment that created the Library Preservation Fund. This measure established a dedicated fund to be used to provide library services and materials, as well as to operate library facilities. Proposition E established a 15-year mandate that requires the City to maintain funding

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[49] San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Pages III.O-23 to III.O-24.

[50] San Francisco Unified School District. 2009 (September). *Capital Plan FY 2010–2019*. Available: http://portal.sfusd.edu/data/facilities/FINAL%20APPROVED%20CAPITAL%20PLAN%202010-2019%20Oct%2027%202009.pdf. Accessed February 11, 2010.

[51] San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Page III.O-32.

[52] San Francisco Public Library. 2010. Branch Library Map. San Francisco, CA. Available: http://sfpl.org/index.php?pg=2000159901. Accessed March 2010.

for the SFPL at a level no lower than what it spent during the 1992 and 1993 fiscal year. Voters renewed the Library Preservation Fund in November 2007 (Proposition D).[53]

BRANCH LIBRARY IMPROVEMENT PROGRAM

The Branch Library Improvement Program (BLIP) was launched as a result of a bond measure passed in November 2000 to provide $106 million in funding to upgrade San Francisco's branch library system, and Proposition D, which passed in November 2007, authorizing additional funding to improve the branches. The BLIP is intended to provide the public with seismically safe, accessible, technologically updated, and code-compliant City-owned branch libraries in every neighborhood.[54]

4.11.2 REGULATORY FRAMEWORK

STATE

California Fire Code

State fire regulations are set forth in Sections 13000 et seq. of the California Health and Safety Code, which include regulations concerning building standards (as also set forth in the California Building Code), fire protection and notification systems, fire protection devices (such as extinguishers and smoke alarms, high-rise building and childcare facility standards), and fire suppression training.[55]

Senate Bill 50 and Proposition 1A

The major source of school construction and modernization was the State School Construction Program until the passage of Senate Bill (SB) 50 and Proposition 1A, both of which passed on November 3, 1998. SB 50 and Proposition 1A provided a comprehensive school facilities financing and reform program, which authorized a $9.2 billion school facilities bond issue, as well as school construction cost containment provisions and an 8-year suspension of the *Mira*, *Hart*, and *Murrieta* court cases.[56] The provisions of SB 50 prohibit local agencies from denying either legislative or adjudicative land use approvals on the basis that school facilities are inadequate.

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[53] San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Page III.O-33.

[54] San Francisco Public Library. 2009 (April 21). *Branch Library Improvement Program—Frequently Asked Questions.* Available: http://sfpl.org/pdf/blip/blipfaq.pdf. Accessed March 2010.

[55] San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Page III.O-16.

[56] There is a series of appellate decisions known as *Mira/Hart/Murrieta*. In *Mira Development Corp. v. City of San Diego* (*Mira*), 205 Cal. App. 3d 1201 (1988); *William S. Hart Union High School District v. Regional Planning Commission* (*Hart*), 226 Cal. App. 3d 1612 (1991); and *Murrieta Valley Unified School District v. County of Riverside* (*Murrieta*), 228 Cal. App. 3d 1212 (1991), the courts held that the limitations of the School Facilities Law of 1986 only applied to municipalities when they made adjudicative decisions (such as approvals of parcel maps, use permits, and building permits) but not when they made legislative decisions (such as general plan amendments, zoning changes, and development agreements). Coalition for Adequate School Housing, 2010. Senate Bill 50 and School Facility Fees: A Report Prepared by C.A.S.H.'s Legal Advisory Committee. Available: http://www.cashnet.org/resource-center/resourcefiles/71.pdf. Accessed March 2010.

SB 50 also reinstates the school facility fee cap for legislative actions (e.g., general plan amendments, specific plan adoption, zoning plan amendments), as was allowed under the *Mira*, *Hart*, and *Murrieta* court cases. According to Government Code Section 65996, the development fees authorized by SB 50 are deemed to be "full and complete school facilities mitigation." The legislation also recognized the need for the fee to be adjusted periodically to keep pace with inflation. These provisions are in effect and will remain in place as long as subsequent state bonds are approved and available. As a result of this legislation, school districts would continue to levy a school fee under existing rules (Government Code Sections 65995, 65995.5, and 65995.7).[57]

CITY/LOCAL

San Francisco Fire Code

The San Francisco Fire Code incorporates by reference the California Fire Code, with certain local amendments. The San Francisco Fire Code was revised in 2007 to regulate and govern the safeguarding of life and property from fire and explosion hazards arising from the storage, handling, and use of hazardous substances, materials, and devices, and from conditions hazardous to life or property in the occupancy of buildings and premises; and to provide for the issuance of permits, inspections, and other SFFD services; and the assessment and collection of fees for those permits, inspections, and services. SFFD reviews building plans to ensure that fire and life safety is provided and maintained in the buildings that fall under its jurisdiction.[58]

SFUSD School Impact Fees

SFUSD began collecting state-authorized school impact fees in 1987, which are collected to mitigate impacts associated with enrollment growth (e.g., new residential development). SFUSD collects fees for all construction and building permits issued within San Francisco. Developer fee revenues are used, in conjunction with other SFUSD funds, to support efforts to complete capital improvement projects.[59] SFUSD's adopted school impact fee for new hospital developments (when building permits are issued) is $0.22 per square foot.[60]

San Francisco Public Library Strategic Plan (2003–2006)

The *San Francisco Public Library Strategic Plan* (SFPL Strategic Plan) was adopted in 2003 and remains the guiding document for SFPL. As stated in the SFPL Strategic Plan, there is no national standard for library service.

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[57] San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Page III.O-27.

[58] San Francisco Fire Department. 2010. Plan Check. Available: http://www.sf-fire.org/index.aspx?page=56. Accessed February 2010.

[59] San Francisco Unified School District. 2009 (June 23). *San Francisco Unified School District Recommended Budget for Fiscal Year 2009–2010.* Second Reading. Recommended by Carlos A. Garcia, Superintendent of Schools, June 2009. Office of the Chief Financial Officer, Budget Division, and Board of Education, Office of the Superintendent. San Francisco, CA. Available: http://portal.sfusd.edu/data/budget/FY%2009-10%20Recommended%20Budget.pdf. Accessed July 21, 2010.

[60] San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Page III.O-28.

Instead, each library must evaluate how it may best meet the needs of the community. To this end, SFPL has developed the SFPL Strategic Plan, which provides every library facility and program with a unifying organizational vision and system-wide goals. These goals are broad and flexible to tailor services to each unique neighborhood. The SFPL Strategic Plan also provides a framework to consider opportunities for new programs and services.[61]

San Francisco General Plan Community Facilities Element

The Community Facilities Element of the *San Francisco General Plan* describes San Francisco's regulatory framework for public services most relevant to the proposed CPMC LRDP. The Community Facilities Element addresses San Francisco's long-range requirements for police and fire facilities. Chapter 3, "Plans and Policies," describes the overall regulatory framework relevant to implementation of the LRDP, including the Community Facilities Element of the *San Francisco General Plan*.

4.11.3 CUMULATIVE CONDITIONS

The proposed CPMC LRDP's potential contribution to cumulative impacts on public services are evaluated in the context of existing, proposed, and reasonably foreseeable future development expected in San Francisco.

4.11.4 SIGNIFICANCE CRITERIA

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been adopted and modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the project would result in a significant impact on public services. Implementation of the proposed project would have a significant effect on public services if it would:

- 11a—result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:
  - fire protection,
  - police protection,
  - schools, or
  - libraries.

Section 4.10, "Recreation," discusses impacts related to local parks and recreation facilities in San Francisco.

[61] Ibid., page III.O-35.

4.11.5 IMPACT EVALUATIONS

METHODOLOGY

Impacts on public services were determined on a citywide basis by analyzing the estimated increase in residential population as a result of project buildout in both the near term (2006–2015) and the long term (2015–2030). A systemwide analysis was also conducted by combing near-term and long-term projects from 2006 to full buildout in 2030. Localized impacts as a result of the increase in average daily population at each campus (i.e. personnel, FTEs, patients, and visitors) are also briefly discussed. Table 4.11-2, “Daily Campus Population, Change in Personnel, and Increase in San Francisco Households and Population, by Campus” (page 4.11-15), provides a summary of the increase in average daily population and the projected change in personnel at each of the campuses that would be generated with the proposed project. The table also shows the change in the number of households and population in San Francisco that would result from the proposed LRDP. The information provided in Table 4.11-2 was used in this DEIR to determine whether increases in average daily campus population and citywide housing and population would have a significant impact on public services. An analysis of public services was not conducted for the California Campus, because no project construction would occur at this location, and it is expected that all inpatient functions at the California Campus would be transferred to the proposed Cathedral Hill Campus once the Cathedral Hill Hospital is opened in 2015 with other services transferring to the Pacific Campus. Additional discussion of the increase in population and associated person trips is provided in Section 4.5, “Transportation and Circulation” (beginning on page 4.5-70). The increase in employment as well as household and population growth projections for San Francisco are further discussed in Section 4.3, “Population, Employment, and Housing.”

Fire Protection

Impacts on fire protection services are considered significant if an increase in population levels would result in inadequate staffing levels, response times, and/or increased demand for services that would require the construction or expansion of new or altered facilities that might have an adverse physical effect on the environment. These impacts were measured on a citywide basis using total LRDP residential population increases and not broken down campus by campus, as the increase in new residents would be distributed throughout San Francisco. Because the increase in residents would be spread throughout the city and would not be concentrated in one specific area, it is reasonable to assume that demand for additional fire protection and emergency medical services related to these new residents would also similarly be distributed citywide. The residential population projections for both near-term LRDP projects and long-term LRDP project buildout provided in Table 4.11-2 were evaluated to determine whether additional staffing and therefore new facilities would be needed to provide adequate future service. There would also be demand for fire protection services related to the increase in average daily on-campus population at each CPMC campus (i.e. personnel, FTEs, patients, and visitors). As shown in

Table 4.11-2
Daily Campus Population, Change in Personnel, and Increase in San Francisco Households and Population, by Campus

Campus	Daily Population	Projected Change in Personnel[1]			San Francisco Households[1]			Increase in Population[1]		
	Net New Population 2006–2030[2]	Near-Term Change 2006–2015	Long-Term Change 2015–2030	Combined Near-Term and Long-Term Projects at Buildout (2006–2030)	Near-Term Change 2006–2015	Long-Term Change 2015–2030	Combined Near-Term and Long-Term Projects at Buildout (2006–2030)	Near-Term Change 2006–2015	Long-Term Change 2015–2030	Combined Near-Term and Long-Term Projects at Buildout (2006–2030)
Cathedral Hill	9,570	4,030	590	4,620	1,440	210	1,650	3,230	620	3,850
Pacific	(1,450)	(1,850)	1,270	(580)	(660)	450	(210)	(1,480)	1,000	(480)
California[2]	(3,540)	(1,150)	(480)	(1,630)	(410)	(170)	(580)	(920)	(440)	(1,360)
Davies	1,150	170	660	830	60	240	300	140	560	690
St. Luke’s	1,200	600	330	930	210	120	330	480	300	770
Total	**6,930**	**1,800**	**2,370**	**4,170**	**640**	**850**	**1,490**	**1,450**	**2,040**	**3,470**

Note:
1 Numbers have been rounded to the nearest 10th.
2 Potential average daily population numbers were derived under the conservative assumption that full buildout would occur by 2020.
3 There would be no net new population growth at the California Campus, as it is expected that all inpatient functions at the California Campus would be transferred to the proposed Cathedral Hill Campus once the Cathedral Hill Hospital is operational in 2015, with nonacute-care services transferring to the Pacific Campus by 2020.
Sources: Tables 4.3-9 and 4.3-10 in Section 4.3,”Population, Employment, and Housing”; Adavant Consulting provided the daily population numbers

Table 4.11-2, a projected increase in personnel would occur at each CPMC campus at buildout, with the exception of the Pacific and California Campuses, which are projected to have a decrease in personnel at buildout. An overall combined increase of approximately 4,170 personnel would be present at the CPMC campuses by 2030, which would have a demand for additional fire protection and emergency medical services at those campus sites. Interviews were conducted with SFFD staff to verify whether current staffing levels could accommodate a potential increase in demand as a result of the project.

Police Protection

Impacts on police protection services are considered significant if an increase in population levels would result in inadequate staffing levels, response times, and/or increased demand for services that would require the construction or expansion of new or altered facilities that might have an adverse physical effect on the environment. These impacts were measured on a citywide basis using total LRDP residential population increases and not broken down campus by campus, as the increase in new residents would be distributed throughout San Francisco. Because the increase in residents would be spread throughout the city and would not be concentrated in one specific area, it is reasonable to assume that demand for additional police protection services related to these new residents would also similarly be distributed citywide. The residential population projections for both near-term LRDP projects and long-term LRDP buildout, as provided in Table 4.11-2, were evaluated to determine whether additional staffing and therefore new facilities would be needed to provide adequate future service. There would also be demand for police protection services related to the increase in average daily on-campus population at each CPMC campus (i.e. personnel, FTEs, patients, and visitors). As described under “Fire Protection” above, there would be an overall combined increase of approximately 4,170 personnel at each CPMC campus by 2030, which would have a demand for additional police protection services at those campus sites. Interviews were conducted with SFPD staff to verify whether current staffing levels could accommodate a potential increase in demand as a result of the project.

Schools

Impacts on schools were determined on a citywide basis by analyzing the estimated increase in student population as a result of LRDP projects both in the near term and at long-term LRDP buildout. This analysis compares the increase in student population to the current capacity of schools to determine whether new or altered facilities would be required, the construction of which could result in substantial adverse environmental effects.

Libraries

Impacts on library services were determined on a citywide basis by analyzing the estimated increase in residential population as a result of LRDP project in both the near term and long term under LRDP project buildout. Given that project-related residential demand would be spread throughout San Francisco, it is reasonable to assume that an increase in library patrons would also be similarly distributed citywide. Impacts on library services are considered significant if an increase in residential population would result in an increased demand for library services that would require the need for new or physically altered library facilities in order to maintain acceptable service ratios, the construction of which could result in substantial adverse environmental effects.

IMPACT PS-1

The project would not result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered fire and emergency services facilities to maintain acceptable service ratios, response times, or other performance objectives. (Significance Criterion 11a)

Levels of significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*
- *Combined local impacts (near term and long term): Less than significant*
- *Citywide (near term and long term): Less than significant*
- *CPMC LRDP projects at full buildout (2030): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

The proposed LRDP is an urban infill project that would not require the expansion of SFFD's service area or extend travel routes between fire stations and service destinations. In implementing near-term projects under the proposed LRDP, CPMC would be required to comply with all applicable provisions of San Francisco's building and fire codes. These codes establish requirements for fire protection systems, such as state-mandated smoke alarms, fire alarm and sprinkler systems, and fire extinguishers, as well as requirements for emergency exits and emergency response notification systems. Because CPMC must comply with the building and fire code provisions, SFFD does not anticipate that implementing near-term projects under the LRDP would degrade service levels below adopted performance objectives, nor would it require new fire service facilities or result in increased staffing needs at any of the fire stations described in Section 4.11.1, "Environmental Setting."[62] Requirements vary for water volume and pressure, physical spacing and locations of hydrants, and fire flow

[62] Zanoff, Andy. Captain–Administration Division. San Francisco Fire Department, San Francisco, CA. September 29, 2009—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on fire department resources.

volume and duration, depending on the specific areas in which the respective campuses are located. CPMC would work with SFFD and local agencies to determine utility and access requirements for fire and emergency services during the project's construction and operation phases at the Cathedral Hill, Davies, and St. Luke's Campuses.[63]

For these reasons, the potential increase in demand for fire protection and emergency medical services due to increases in on-campus average daily population (i.e. personnel, FTEs, patients, and visitors) at the Cathedral Hill, Davies, and St. Luke's Campuses with implementation of near-term projects is not expected to result in inadequate staffing levels or require new or physically altered fire protection facilities. **This impact would be less than significant**.

For a detailed discussion of emergency access and response, please see pages 4.16-72 through 4.16-76 in Section 4.16, "Hazards and Hazardous Materials." As described, each existing CPMC campus already has an emergency response plan to be implemented for casualties in the event of an internal or external disaster. Each campus coordinates with the Hospital Council Emergency Preparedness Partnership, Emergency Medical Services, and SFFD (coordinating 911 and Neighborhood Emergency Response Team). A similar emergency response plan would be created for the proposed Cathedral Hill Campus. Implementation of near-term projects at the Cathedral Hill, Davies, and St. Luke's Campuses would not interfere with emergency access. Therefore, **this impact would be less than significant**.

Construction of the proposed Cathedral Hill Campus, additions at the Davies Campus occurring in the near term, and expansions at the St. Luke's Campus could affect the ability of fire and emergency services to maintain acceptable service ratios, response times, and other performance objectives. Slow-moving, construction-related traffic around the campuses could reduce traffic flows and delay emergency vehicles traveling through the area, thereby potentially affecting emergency response times.[64] However, given the width of surrounding streets near the Cathedral Hill Campus, impacts related to response times are expected to be less than impacts in other more congested areas.[65] Therefore, **this impact would be less than significant.** (Please refer to Section 4.5, "Transportation and Circulation," for more information on traffic flow and street closures.) However, any street closures or temporary obstruction would be subject to SFFD emergency access standards, requirements, and review, which would reduce construction-related effects on response times.

Cathedral Hill Campus with Project Variants: The project variants proposed for the Cathedral Hill Campus would have varying effects on emergency access. The Two-Way Post Street Variant would create two-way

[63] Thompson, Michael. Assistant Deputy Chief. Support Services. San Francisco Fire Department. San Francisco, CA. May 27, 2010—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on fire department resources.

[64] Zanoff, Andy. Captain–Administration Division. San Francisco Fire Department, San Francisco, CA. September 29, 2009—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on fire department resources.

[65] Thompson, Michael. Assistant Deputy Chief. Support Services. San Francisco Fire Department. San Francisco CA. May 27, 2010—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on fire department resources.

vehicular access on Post Street between Van Ness Avenue and Franklin Street, and thus would provide access to the hospital from two directions. The effects of this variant and the MOB Access Variant on emergency access at the proposed Cathedral Hill Campus are analyzed in Impact TR-17 in Section 4.5, “Transportation and Circulation,” beginning on page 4.5-110. With the No Van Ness Avenue Pedestrian Tunnel Variant, the proposed underground pedestrian tunnel would not be constructed, and patients, visitors, and CPMC personnel would have to cross Van Ness Avenue to be able to travel between the proposed Cathedral Hill Hospital and Cathedral Hill MOB. The additional pedestrians crossing at existing intersection crosswalks would not have a substantial effect on response times. Implementation of the tunnel variant could reduce the construction-related impact on emergency response times relative to the impact described above because tunnel construction activities would not occur. Under this project variant, the impact on fire protection and emergency services would be similar to or potentially less than the impact discussed above. **This impact would be less than significant.**

St. Luke’s Campus with Alternate Emergency Department Location Variant: This variant would relocate the Emergency Department and ambulance bay for the St. Luke’s Replacement Hospital to Cesar Chavez Street. To ensure that emergency vehicles would not be delayed in reaching the hospital, CPMC would seek an “emergency access only” cut-through to the median at Cesar Chavez Street. Assuming that this emergency access cut-through would be constructed under this variant, this impact would be similar to the impact discussed above. Therefore, **this impact would be less than significant**.

St. Luke’s Campus with Cesar Chavez Street Utility Line Alignment Variant: This variant would reroute electrical lines and a sewer line. As described above in the discussion of near-term projects, any street closures or temporary obstruction would be subject to SFFD emergency access standards, requirements, and review, which would reduce construction-related effects on response times. Further, sewer relocation would be coordinated with the San Francisco Public Utilities Commission (SFPUC)’s Cesar Chavez Street Sewer System Improvement Project. Therefore, for the same reasons as discussed above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, and St. Luke’s Campuses in the near term.

◆ Combined Local Impacts of Near-Term Projects

By 2015, net increases of approximately 4,030, 170, and 600 FTE personnel, respectively, would occur at the Cathedral Hill, Davies, and St. Luke’s Campuses; also, net decreases of approximately 1,850 and 1,150 FTE personnel, respectively, would occur at the Pacific and California Campuses (see Table 4.11-2). The average daily populations at the Cathedral Hill, Davies, and St. Luke’s Campuses (including personnel, patients, and visitors) at full campus operation are estimated to be 9,570, 1,150, and 1,200 people, respectively. These campuses would not be fully occupied in 2015, but the majority of the population increase at the proposed Cathedral Hill Campus—the campus with the primary increase in daily population—would have occurred by that point. An overall net increase of approximately 1,800 FTE personnel would occur between 2006 and 2015, with an associated increase in average daily population, including patients and visitors, and overall increased activity on these CPMC campuses. However, the increase would occur over time and would be accounted for as part of CPMC LRDP near-term operations in their future projections discussed above (e.g., compliance with the building and fire code provisions, development of an emergency response plan for the Cathedral Hill Campus, and coordination with SFFD and local agencies to determine utility and access requirements for fire and emergency services). The increase in personnel and average daily population on campus would therefore, not substantially increase the demand for fire and emergency services at these campuses. Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at any of the CPMC campuses in the near term.

◆ Citywide Impacts of Near-Term Projects

This section provides a discussion of public service demands that could result from potential new households and new residences created under CPMC's near-term projects. As described on pages 4.3-14 through 4.3-15 in Section 4.3, "Population, Employment, and Housing," implementing near-term projects under the proposed LRDP would increase employment at CPMC campuses by a net total of approximately 1,800 FTE employees by 2015 as compared to existing conditions (2006). Assuming that 49% of CPMC FTE personnel would choose to live and work in San Francisco, this would indirectly thereby indirectly potentially add approximately 640 new households and approximately 1,450 new residents to San Francisco. It should be noted that this increase would occur incrementally from 2006 through 2015. This would increase San Francisco's population because a portion of new CPMC personnel would reside in the city. The additional 1,450 potential new residents by completion of near-term development could increase the number of calls or the level of regulatory oversight that SFFD and emergency services must provide. However, the increase in residents would not concentrate in a specific area, but would rather be dispersed throughout San Francisco. Therefore, demand for additional fire protection and emergency medical services would also be similarly distributed citywide and would not place undue demand on any one fire station. The distribution of new residents would not raise demand for fire protection and emergency medical services above and beyond levels expected in dense urban areas. A share of the overall increased demand would also be offset by decreases in employment at the Pacific and California Campuses.

In addition, as explained in Section 4.3, "Population, Employment, and Housing" (beginning in the discussion of near-term projects in Impact PH-1 on page 4.3-18), implementing the proposed LRDP would not induce population growth above existing Association of Bay Area Governments (ABAG) forecasts for regional population growth. Therefore, implementing the near-term projects under the LRDP would not result in additional demand for fire protection and emergency medical services beyond what has already been projected to accommodate future citywide growth.

For these reasons, the potential increase in demand for fire protection and emergency medical services resulting from the introduction of new residents to San Francisco from implementation of the near-term LRDP projects is not expected to result in inadequate staffing levels or require new or physically altered fire protection facilities. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required citywide in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

As described above for near-term projects under the proposed LRDP, CPMC would be required to comply with all applicable provisions of San Francisco's building and fire codes for long-term projects at the Pacific and Davies Campuses. The SFFD does not anticipate that implementing the long-term projects under the LRDP would degrade service levels below adopted performance objectives, nor would it require new fire service facilities or result in increased staffing needs at any of the fire stations described in Section 4.11.1, "Environmental Setting."[66] Therefore, **this impact would be less than significant.** Further, the potential increase in demand for fire protection and emergency medical services due to increases in on-campus average daily population (i.e. personnel, FTE, patients, and visitors) at the Pacific and Davies Campuses in the long-term is not expected to result in inadequate staffing levels or require new or physically altered fire protection facilities. CPMC would work with SFFD to determine utility and access requirements for fire and emergency services during the construction and operation phases of long-term projects at the Pacific and Davies Campuses. This long-term impact is similar to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. For the same reasons as described above, **this impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at the Pacific Campus or Davies Campus in the long term.

◆ Combined Local Impacts of Long-Term Projects

Between 2015 and 2030, net increases of approximately 590, 1,270, 660, and 330 FTE personnel, respectively, would occur at the Cathedral Hill, Pacific, Davies, and St. Luke's Campuses. Additionally, a net decrease of 480 FTE personnel would occur at the California Campus (see Table 4.11-2). There would be an overall net increase in FTE personnel of approximately 2,370 people between 2015 and 2030, with an associated increase in average

[66] Ibid.

daily population on campus, including patients, FTE personnel visitors and overall increased activity on these campuses. However, this increase would occur over time and would be accounted for by the SFFD as part of CPMC LRDP long-term operations in their future projections. The increase in FTE personnel and average daily population on campus and therefore, would not substantially increase the demand for fire and emergency services at these campuses. Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at any of the CPMC campuses in the long term.

◆ Citywide Impacts of Long-Term Projects

Implementing the long-term projects under the LRDP would increase employment at CPMC by a net total of approximately 2,370 FTE personnel between 2015 and 2030. Assuming that 49% of CPMC FTE personnel would choose to live and work in San Francisco, this would indirectly potentially add an estimated 850 households and 2,040 net new residents to San Francisco (see Table 4.11-2). The impact on public service demands that could result from the potential new households and new residences created under CPMC's long-term projects would be similar to the near-term impacts identified above. Because the new residents and households would be distributed citywide, the potential increase in demand for fire protection and emergency medical services is not expected to result in inadequate staffing levels or require new or physically altered fire protection facilities. Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide in the long term.

CPMC LRDP Projects at Full Buildout (2006–2030)

◆ Local Impacts at Buildout

By 2030, net increases in average daily population relative to existing conditions (2006) of approximately 9,570, 1,150, and 1,200 people, respectively, would occur at the Cathedral Hill, Davies, and St. Luke's Campuses. Additionally, a net decrease of 480 people and 1,360 people, respectively, would occur at the Pacific Campus and the California Campus (see Table 4.11-2). There would be an overall net increase in average daily population and additional activity within the CPMC campuses because of the increase of CPMC personnel, patients, and visitors at three of the five campuses (Cathedral Hill, Davies, and St. Luke's) under the proposed LRDP at full buildout. However, this increase would occur over time is accounted for by the SFFD as part of CPMC LRDP operations at full buildout as part of their future projections for fire protection services in the city. In addition, compliance with the building and fire code provisions, development of an emergency response plan for the Cathedral Hill Campus and all other existing CPMC Campuses, and coordination with SFFD and local agencies to determine utility and access requirements for fire and emergency services doing ongoing operations would also ensure that no significant impacts on fire protection services occur. The increase in FTE personnel and average daily population on campus would not substantially increase the demand for fire and emergency services at these campuses at full buildout. Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at any of the CPMC campuses in the long term.

◆ Citywide Impacts at Buildout

The combined impact of implementing near-term and long-term projects under the LRDP would increase employment at CPMC by a net total of 4,170 FTE personnel, thereby indirectly potentially adding an estimated 1,490 households and 3,470 new residents to the city between 2006 and 2030 (see Table 4.11-2). The projected increase in population by 2030 would be distributed citywide, without disproportionately affecting fire protection and emergency medical services that would result in inadequate staffing levels above and beyond levels expected in dense urban areas. **The combined near-term and long-term impacts of the LRDP on fire protection and emergency services related to the potential addition of new San Francisco residents would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required citywide at full buildout.

IMPACT PS-2

The project would not result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered police protection facilities to maintain acceptable service ratios, response times, or other performance objectives. (Significance Criterion 11a)

Levels of significance:

- *Cathedral Hill (with or without project variants): Less than significant with mitigation*
- *Pacific: Less than significant*
- *Davies: Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*
- *Combined local impacts (near term and long term): Less than significant*
- *Citywide (near term and long term): Less than significant*
- *CPMC LRDP projects at full buildout (2030): Less than significant*

Near-Term Projects

◆ Cathedral Hill Campus

The proposed LRDP is an urban infill project that would not require the expansion of SFPD's service area or extend travel routes between police stations and service destinations. It is expected that all inpatient functions at Pacific Campus and the Women and Children's Center at the California Campus would be transferred to the proposed Cathedral Hill Campus. The average daily population at the proposed Cathedral Hill Campus at full operation—including FTE personnel, patients, and visitors—is estimated to be 9,570 people. The Cathedral Hill Campus would be operational by mid-2015. For this analysis, it is assumed that the majority of the population increase at this campus would occur by the end of 2015. The increase in on-campus average daily population (i.e. personnel, patients, and visitors) and overall increased activity at the proposed Cathedral Hill Campus would be expected to increase the number of traffic and police incidents and calls. However, because of the presence of contracted security personnel as described below, this increase would not substantially change the demand for police protection facilities in a manner that would negatively affect service ratios, response times, or other SFPD performance objectives for the Northern Police Station, which has primary response responsibilities for the Cathedral Hill Campus vicinity.[67] A share of the increased demand at the proposed Cathedral Hill Campus would also be offset by decreases in employment at the Pacific and California Campuses, although these campuses are located in different areas of the city. The on-campus increase in demand for police services would be more localized around campuses which would have increased average daily population and activity.

CPMC currently provides on-campus security at all four existing campuses through its contract with a private security company. Additional contracted security at the proposed Cathedral Hill Campus would provide 24-hour surveillance, 7 days a week. Contracted security personnel would patrol the campus and work cooperatively with SFPD during both construction and operation of the campuses. Therefore, operation of the near-term projects would not result in changes to service levels, in the campus area or citywide, such that new police protection facilities would need to be built.

The Cathedral Hill Campus would replace the existing Cathedral Hill Hotel and 1255 Post Street Office Building (site of the proposed Cathedral Hill Hospital), as well as seven other existing mixed-use buildings (site of the proposed Cathedral Hill MOB) located on busy blocks generally bounded by Geary Boulevard and Post, Polk, and Franklin Streets. Construction-related impacts of the Cathedral Hill Campus project associated with traffic and circulation are identified in Section 4.5, "Transportation and Circulation." Construction activities around the campuses could reduce traffic flows and delay emergency vehicles traveling through the area. As described in

[67] Mannix, Ann. Northern District. San Francisco Police Department. San Francisco CA. December 2, 2009—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on police resources.

Impact PS-1, SFFD officials indicated that impacts related to response times are expected to be less than those in other more congested areas, given the width of surrounding streets near the Cathedral Hill Campus[68]; however, SFPD indicated that construction activities at Cathedral Hill could result in a temporary effect on police services between 2011 and 2015 if construction activities cause traffic conflicts that could delay police response times.[69] Therefore, **this impact would be potentially significant**.

Cathedral Hill Campus with No Van Ness Avenue Pedestrian Tunnel Variant: This project variant would not affect the demand for police services. Because tunnel construction activities would not occur, implementation of this variant could reduce the construction-related effect on police response times as compared to the impact described above. Overall, however, the impact on police protection services would not change. As a result, this impact would be similar to the impact discussed above. **This impact would be potentially significant**.

Mitigation Measure for Cathedral Hill Campus (with or without project variant)

M-PS-N2 CPMC shall implement Mitigation Measure M-TR-55, as described in Section 4.5, "Transportation and Circulation" (beginning on page 4.5-159).

With implementation of Mitigation Measure M-PS-N2, CPMC would develop a transportation management plan (TMP) for construction to anticipate and minimize impacts of various construction activities associated with the proposed near-term projects. Under this plan, appropriate information would be distributed to contractors and affected agencies regarding coordination of construction activities to minimize overall disruptions and ensure that overall circulation is maintained to the extent possible. The program would supplement and expand, rather than modify or supersede, any manual, regulations, or provisions set forth by the San Francisco Municipal Transportation Agency, San Francisco Department of Public Works, or other City departments and agencies. The TMP would include construction strategies, demand management activities, alternative route strategies, and public information strategies. In addition, the TMP would provide necessary information to various contractors and agencies as to how to maximize the opportunities for complementary construction management measures and to minimize the possibility of conflicting impacts on the roadway system, while safely accommodating the traveling public in the area. Therefore, **implementing Mitigation Measure M-PS-N2 would reduce Impact PS-2 to a less-than-significant level**.

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[68] Thompson, Michael. Assistant Deputy Chief. Support Services. San Francisco Fire Department. San Francisco CA. May 27, 2010—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on fire department resources.
[69] Mariles, Boaz. Press Information Officer, Media Relations. San Francisco Police Department. San Francisco, CA. April 19, 2010—e-mail message to Stephanie Klock of AECOM regarding effect of the proposed LRDP on police services.

◆ Davies and St. Luke's Campuses

The near-term proposals at the Davies and St. Luke's Campuses would add additional square footage to the existing campuses and would represent a continuation and intensification of existing institutional uses on each campus. The near-term LRDP projects at the Davies and St. Luke's Campuses would increase the number of FTE personnel at these campuses by 169 and 595, respectively, by 2015. The additional activity and FTE personnel associated with the LRDP proposal at the Davies and St. Luke's Campuses would be expected to increase the number of traffic and police incidents calls in the vicinity of these campuses and would place additional demand on the area's police stations. However, because of the presence of contracted security patrol at these two campuses, this increase would not substantially change the demand for police protection facilities in a manner that would negatively affect service ratios or response times, or other SFPD performance objectives at the Ingleside, Mission, or Park Police Station.[70, 71, 72] Therefore, the demand for police services resulting from implementation of near-term projects at the Davies and St. Luke's Campuses under the LRDP would not be substantially greater than existing demand. For these reasons, **this impact would be less than significant**.

Construction-related impacts of the Davies and St. Luke's Campus projects associated with traffic and circulation are identified in Section 4.5, "Transportation and Circulation" (beginning on pages 4.5-184 and 4.5-200, respectively). Construction at the Davies and St. Luke's Campuses would not substantially affect traffic circulation, and any potential impacts would not be considered significant because of their temporary and limited duration. Construction of the Neuroscience Institute at the Davies Campus would commence in 2011 and would continue for approximately 2 years. Construction at the St. Luke's Campus would also commence in 2011 and would continue for approximately 7 years. In general, any lane closures as a part of construction activities would be subject to review and approval by the San Francisco Department of Public Works and the City's Interdepartmental Staff Committee on Traffic and Transportation.

St. Luke's Campus with Project Variants: As stated above under Impact PS-1, to ensure that emergency vehicles would not be delayed in reaching the St. Luke's Replacement Hospital if the Alternate Emergency Department Location Variant were implemented, CPMC would seek an "emergency access only" cut-through to the median of Cesar Chavez Street. Assuming that this cut-through would be constructed, this impact would be similar to the impact of near-term impacts discussed above. The impact of the Cesar Chavez Street Utility Line Alignment would also be similar to the impact discussed above. Street closures or temporary obstruction would be subject to applicable SFPD emergency access standards, thus reducing construction-related effects on response

[70] Barrett, Teresa. Commanding Officer, Park Station. San Francisco Police Department. San Francisco CA. October 14, 2009—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on police resources.
[71] Tacchini. Captain, Mission Station. San Francisco Police Department. San Francisco CA. October 8, 2009—e-mail message to Stephanie Klock of AECOM from Melendez Mirna on behalf of Captain Tacchini regarding project-related impacts on police resources.
[72] Lee, Franklin. Lieutenant, Ingleside Station. San Francisco Police Department. San Francisco CA. September 30, 2009—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on police resources on behalf of Captain David Lazar.

times. Additionally, sewer relocation would be coordinated with SFPUC's Cesar Chavez Street Sewer System Improvement Project. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus or St. Luke's Campus in the near term.

◆ Combined Local Impacts of Near-Term Projects

As described for Impact PS-1, by 2015 there would be a net increase in FTE personnel at the Cathedral Hill, Davies, and St. Luke's Campuses and a net decrease in the FTE personnel at the Pacific and California Campuses (see Table 4.11-2). An overall net increase of approximately 1,800 FTE personnel would occur at the campuses between 2006 and 2015. The additional activity associated with intensifying the existing institutional uses at several of the campuses and adding new institutional uses at the proposed Cathedral Hill Campus would be expected to increase the number of traffic and police incidents and calls; however, this increase would not substantially change demand for police protection facilities in a manner that would negatively affect service ratios, response times, or other SFPD performance objectives.[73, 74, 75, 76] Contracted security personnel would patrol the campuses and work cooperatively with SFPD during operation of the campuses. Therefore, the increase in average daily population on campus would not substantially increase the local demand for police services. For these reasons, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at any of the CPMC campuses in the near term.

◆ Citywide Impacts of Near-Term Projects

This section provides a discussion of police services demands that could result from potential new households and new residences created as a result of the employment generated by the CPMC's near-term projects at the Cathedral Hill, Davies, and St. Luke's Campuses. Assuming that 49% of CPMC FTE personnel would choose to live and work in San Francisco, , near-term projects under the proposed LRDP could indirectly add 643 households and 1,439 residents new to the city between 2006 and 2015, which could increase the number of citywide calls or the level of regulatory oversight that SFPD must provide. This would increase San Francisco's population because a portion of new CPMC personnel would reside in the city. This increase would occur incrementally between 2006 and 2015 and the additional 1,439 new residents would be dispersed throughout San

[73] Barrett, Teresa. Commanding Officer, Park Station. San Francisco Police Department. San Francisco, CA. October 14, 2009—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on police resources.
[74] Tacchini. Captain, Mission Station. San Francisco Police Department. San Francisco CA. October 8, 2009—e-mail message to Stephanie Klock of AECOM from Melendez Mirna on behalf of Captain Tacchini regarding project-related impacts on police resources.
[75] Lee, Franklin. Lieutenant, Ingleside Station. San Francisco Police Department. San Francisco CA. September 30, 2009—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on police resources on behalf of Captain David Lazar.
[76] Mannix, Ann. Northern District. San Francisco Police Department. San Francisco CA. December 2, 2009—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on police resources.

Francisco and would not place undue demand on any one police station or substantially increase the number of service calls to any one area in the city. As explained in Section 4.3, “Population, Employment, and Housing” (beginning in the discussion of near-term projects in Impact PH-1 on page 4.3-18), implementing the proposed LRDP would not induce growth above existing ABAG forecasts for regional population growth in the city. According to SFPD personnel, SFPD does not expect the proposed LRDP to require new or physically altered police facilities; however, an increase in calls for service is expected.[77] Any potential increase in calls for service would be dispersed among SFPD’s district stations and the distribution of new residents would not result in additional demand for police services beyond what has already been planned.

For these reasons, the potential increase in demand for police services resulting from the potential new residents to San Francisco under the near-term LRDP projects is not expected to require new or physically altered police protection facilities. **This impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

As noted in Table 4.11-2, the average daily population at the Pacific Campus (as well as the California Campus) is expected to decrease between 2006 and 2030, with uses transferring to the proposed Cathedral Hill Campus. Despite the long-term overall decrease in population at the Pacific Campus, the number of FTE personnel would increase between 2015 and 2030 by 1,270, serving to reoccupy the campus, which would have decreased in FTE personnel by 1,850 in the near term (2006–2015). Therefore, no additional demand for police services beyond existing conditions (2006) would be required at the Pacific Campus. As described above for near-term projects under the proposed LRDP, CPMC would continue to employ contracted security personnel at the Pacific and Davies Campuses to patrol the site, who would work cooperatively with SFPD during construction and operation of the campuses.

The potential increase in demand for police protection due to increases in on-campus average daily population The additional activity associated with the long-term LRDP proposal at Davies Campus would be expected to increase the number of traffic and police incidents and calls; however, this increase would not substantially change the demand for police protection facilities in a manner that would negatively affect service ratios, response

[77] Mariles, Boaz. Press Information Officer, Media Relations. San Francisco Police Department. San Francisco, CA. April 19, 2010—e-mail message to Stephanie Klock of AECOM regarding effect of the proposed LRDP on police services.

times, or other SFPD performance objectives for the Northern or Park Police Station.[78, 79] Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific or Davies Campuses in the long term.

◆ Combined Local Impacts of Long-Term Projects

As described for Impact PS-1, between 2015 and 2030 there would be a net increase in FTE personnel at the Cathedral Hill, Pacific, Davies, and St. Luke's Campuses as compared to existing conditions (2006), as well as a net decrease in the FTE personnel at the California Campus (see Table 4.11-2). An overall net increase in FTE personnel of approximately 2,370 people would occur between 2015 and 2030, with an associated increase in average daily population on campus, including FTE personnel, patients, visitors, and overall increased activity on the hospital campuses; however, the increase would not substantially increase the demand for police protection facilities in a manner that would negatively affect service ratios, response times, or other SFPD performance objectives.[80, 81, 82, 83] The additional activity associated with intensifying the existing institutional uses at several of the campuses and adding new institutional uses at the Cathedral Hill Campus would be expected to increase the number of traffic and police incidents and calls; however, contracted security personnel would patrol the campuses and work cooperatively with SFPD during operation of the campuses, further ensuring that no significant impacts on police services occur. Therefore, the local demand for police services resulting from implementation of long-term projects would not be substantially greater than existing demands. For these reasons, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at any of the CPMC campuses in the long term.

◆ Citywide Impacts of Long-Term Projects

Implementing the long-term projects under the LRDP would increase employment at CPMC by a net total of approximately 2,370 FTE personnel. Assuming that 49% of CPMC FTE personnel would choose to live and work in San Francisco, this could indirectly add an estimated 850 households and 2,040 residents new to the city between 2015 and 2030 (see Table 4.11-2). As with the near-term projects, any potential increase in calls for

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[78] Mannix, Ann. Northern District. San Francisco Police Department. San Francisco CA. December 2, 2009—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on police resources.
[79] Barrett, Teresa. Commanding Officer, Park Station. San Francisco Police Department. San Francisco CA. October 14, 2009—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on police resources.
[80] Ibid.
[81] Mannix, Ann. Northern District. San Francisco Police Department. San Francisco CA. December 2, 2009—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on police resources.
[82] Tacchini. Captain, Mission Station. San Francisco Police Department. San Francisco CA. October 8, 2009—e-mail message to Stephanie Klock of AECOM from Melendez Mirna on behalf of Captain Tacchini regarding project-related impacts on police resources.
[83] Lee, Franklin. Lieutenant, Ingleside Station. San Francisco Police Department. San Francisco CA. September 30, 2009—e-mail message to Stephanie Klock of AECOM regarding project-related impacts on police resources on behalf of Captain David Lazar.

service would be dispersed among SFPD's district stations, and the distribution of new residents would not result in additional demand for police services beyond what has already been planned. For these reasons, the potential increase in demand for police services resulting from the potential new residents to San Francisco under the long-term project is not expected to require new or physically altered police protection facilities, and **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide in the long term.

CPMC LRDP Projects at Full Buildout (2006–2030)

◆ Local Impacts at Buildout

By 2030, the average daily population at the Cathedral Hill, Davies, and St. Luke's Campuses would increase by approximately 9,570, 1,150, and 1,200 people, respectively, relative to existing conditions (2006); also, net decreases in average daily population of approximately 1,450 people and 3,540 people, respectively, would occur at the Pacific and California Campuses, which would offset some of the increases at other campuses. The increased activity at the Cathedral Hill, Davies, and St. Luke's Campuses would be expected to increase the number of traffic and police incidents and calls at police stations in the vicinity of these campuses; however, the increase would not be substantial because of CPMC's use of contracted security personnel at these campuses. No additional police facilities would be required to maintain acceptable service ratios, response times, or other SFPD performance objectives; therefore, **this impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at any of the CPMC campuses at full buildout.

◆ Citywide Impacts at Buildout

The combined impact of implementing near-term and long-term projects under the LRDP would increase employment at CPMC by a net total of approximately 4,170 FTE personnel, thereby indirectly potentially adding an estimated 1,490 households and 3,470 net residents new to the city between 2006 and 2030 (see Table 4.11-2). The projected increase in population by 2030 would be distributed citywide, without disproportionately affecting police services above and beyond levels expected in dense urban areas. **The combined near-term and long-term impacts of the LRDP on police services related to the potential addition of new San Francisco residents would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required citywide at full buildout.

IMPACT PS-3 *The project would not result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered schools to maintain acceptable service ratios or other performance objectives. (Significance Criterion 11a)*

Levels of significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: No impact*
- *Davies: Less than significant (near term), no impact (long term)*
- *St. Luke's (with or without either project variant): Less than significant*
- *Citywide (near term and long term): Less than significant*
- *CPMC LRDP projects at full buildout (2030): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

The near-term projects under the proposed LRDP would not include housing and would not directly add a residential population to the campus sites. Therefore, implementation of the LRDP at the Cathedral Hill, Davies, and St. Luke's Campus in the near term would not result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered schools to maintain acceptable service ratios or other performance objectives. **This impact would be less than significant.**

Cathedral Hill and St. Luke's Campuses with Project Variants: None of the variants proposed for these campuses would result in an increase in residential populations or affect the demand for schools. Therefore, this impact would be similar to the impact discussed above. **This impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, and St. Luke's Campuses in the near term.

◆ Citywide Impacts of Near-Term Projects

This section provides a discussion of potential demands on schools that could result from the potential new households and new residences created under CPMC's near-term projects. As described in Section 4.3, "Population, Employment, and Housing," total personnel numbers for the Cathedral Hill, Davies, and St. Luke's Campuses are projected to increase, thereby potentially indirectly adding a total of 643 new households and 1,439 new residents to San Francisco incrementally between 2006 and 2015. This would increase San Francisco's population because a portion of new CPMC personnel would reside in the city, and some would have school-age children. The estimated number of school-age children was derived using the student generation rate provided by SFUSD—a rate of 0.203 student (including elementary, middle, and high school students) per new housing unit.[84] Multiplying the number of new households by the student generation factor of 0.203 (assuming that students are distributed evenly by grade) results in a total of approximately 130 school-age children in the near term (2006–2015).

These estimated 130 school-age children associated with the near-term projects under the proposed LRDP would increase the number of students attending SFUSD schools. Although the number of students in SFUSD schools has been steadily decreasing for the last decade and many schools have excess capacity, it appears that this trend was changing as of fall 2008. Given that the 2008 SFUSD school capacity was 63,835 and the districtwide enrollment as of 2008 was 55,272, enrollment of an additional 130 students (between 2006 and 2015) from the potential new households created by CPMC's near-term projects would not substantially change the demand for schools. It is not expected that new facilities would be needed to accommodate the students. **This impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

The long-term projects under the proposed LRDP would not include housing and would not directly add residential population to the campus sites. Therefore, implementation of the LRDP at the Pacific and Davies Campuses in the long term would not result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered schools to maintain acceptable service ratios or other performance objectives. **No impact would occur.**

Mitigation Measure: No mitigation or improvement measures are required at the Pacific and Davies Campuses in the long term.

◆ Citywide Impacts of Long-Term Projects

This section provides a discussion of potential demands on schools that could result from the potential new households and new residences created under CPMC's long-term projects. Implementing the long-term projects

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[84] San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Page III.O-29.

under the LRDP would potentially indirectly introduce an estimated 850 households and 2,040 new residents between about 2015 and 2030. This would increase San Francisco's population because a portion of new CPMC personnel would reside in the city, and some would have school-age children (see Table 4.11-2).

Using SFUSD's student generation factor of 0.203, an estimated 173 school-age children would be added to the SFUSD public school system between 2015 and 2030. As with the near-term impacts identified above, an increase in 173 students between 2015 and 2030 is not likely to cause SFUSD to exceed its school capacity, or to substantially change the demand for schools. It is not expected that new facilities would be needed to accommodate the students. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide in the long term.

◆ CPMC LRDP Projects at Full Buildout (2006–2030)

As described in Section 4.3, "Population, Employment, and Housing," total FTE personnel at full LRDP buildout would increase by approximately 4,170 people, thereby potentially indirectly adding an estimated 1,490 households and 3,470 new residents between 2006 and 2030 (see Table 4.11-2). Using SFUSD's student generation factor of 0.203, an estimated total of approximately 300 school-age children could potentially be added to the SFUSD public school system between 2006 and 2030 as a result of full buildout under the proposed LRDP. Enrollment of an additional 300 students (between 2006 and 2015) from the potential new households created by CPMC's LRDP at full buildout would not substantially change the demand for schools. It is not expected that new facilities would be needed to accommodate the students. **This impact would be less than significant**.

IMPACT PS-4

The project would not result in substantial adverse physical impacts associated with the provision of, or the need for, new or physically altered libraries to maintain acceptable service ratios or other performance objectives. (Significance Criterion 11a)

Levels of significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: Less than significant*
- *Davies: Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*
- *Citywide (near term and long term): Less than significant*
- *CPMC LRDP projects at full buildout (2030): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

The near-term projects associated with the LRDP would not affect San Francisco's library system because the projects would not include housing, and would not directly add a residential population that would require library services from SFPL. Also, no SFPL branches are located at the site of the proposed Cathedral Hill Campus, or at the Davies and St. Luke's Campuses. All library services would be available to the community throughout the duration of project construction. Therefore, library services would not be affected by construction of the near-term projects. **This impact would be less than significant.**

Cathedral Hill and St. Luke's Campuses with Project Variants: None of the project variants proposed for these campuses would result in an increase in residential populations or affect demand for libraries. Therefore, this impact would be similar to the impact discussed above. **This impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, and St. Luke's Campuses in the near term.

◆ Citywide Impacts of Near-Term Projects

Implementing the near-term projects under the LRDP would incrementally increase the population in San Francisco. Although the projects would potentially indirectly introduce an estimated 643 new households and 1,439 new residents between 2006 and 2015, the increase in residents would be spread throughout San Francisco and would not place excessive demand on any one library branch. A small increase in the number of library patrons could be expected because of the addition of new residents; however, it is anticipated that the existing SFPL branches would continue to meet the demands of the community. If materials are not available at a specific branch, materials can be made available in a matter of days through SFPL's delivery system. This delivery system provides for the delivery of materials from one branch to another branch and utilizes the Link+ system to access books at participating libraries in California. SFPL users can also request a loan from the Interlibrary Loan system, which involves loaning items from various libraries and institutions in North America. As a result, materials available to library patrons are not limited to those housed at their neighborhood libraries, making the number of volumes at each branch location not a valid measure to evaluate library services. In the event that additional services are needed in any neighborhood, SFPL dispatches a bookmobile to address immediate needs; in addition, the SFPL Strategic Plan would provide guidance for addressing increased demands resulting from population growth in consideration of the branch's fixed budget.

The library system within San Francisco could accommodate increased demand from the proposed near-term projects, because any increase in library patrons would be scattered throughout San Francisco and additional library facilities would not be required to accommodate development under the LRDP. As a result, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

The long-term projects under the proposed LRDP would not include housing and would not directly add a residential population that would require library services from SFPL. As a result, library services would not be affected by construction of the long-term projects at the Pacific and Davies Campuses. For the same reasons as described above for the Cathedral Hill, Davies, and St. Luke's Campuses, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific and Davies Campuses in the long term.

◆ Citywide Impacts of Long-Term Projects

Implementing the long-term projects under the proposed LRDP would potentially indirectly introduce an estimated 850 households and 2,039 new residents between 2015 and 2030. The library system within San Francisco could accommodate increased demand from the proposed long-term projects, because any increase in library patrons would be scattered throughout San Francisco and additional library facilities would not be required to accommodate development under the LRDP. This impact would be similar to the citywide impacts of near-term projects identified above. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required citywide in the long term.

◆ CPMC LRDP Projects at Full Buildout (2006–2030)

As described in Section 4.3, "Population, Employment, and Housing," total FTE personnel at full LRDP buildout would increase by approximately 4,170 people, thereby potentially indirectly adding an estimated 1,490 households and 3,470 new residents between 2006 and 2030 (see Table 4.11-2). For the same reasons as described above under the near-term and long-term impacts, **the impact resulting from LRDP buildout would be less than significant**.

4.11.6 CUMULATIVE IMPACTS

The proposed LRDP, when combined with other reasonably foreseeable projects, is not expected to result in cumulative impacts with respect to public services. Implementing the LRDP could result in an incremental increase in demand for fire and police services because of increases in daily population at some of the campuses in addition to the increase in the city's population; however, both SFFD and SFPD personnel have indicated that the LRDP would not have a substantial effect on their services. Furthermore, these services are subject to an annual budgeting process during which citywide priorities are established and service levels monitored, allowing for adjustments where needed. Therefore, **the cumulative impact on fire or police protection services related to the LRDP and foreseeable future developments in San Francisco would be less than significant**.

The proposed LRDP would not include housing and would not directly add a residential population to the campus sites. However, an incremental increase in San Francisco's population would result from the potential new households and new residences created with implementation of the LRDP. It is not anticipated that the LRDP, when combined with other reasonably foreseeable projects, would result in an adverse cumulative impact on public school services or libraries, because any demand on the schools and library system would be distributed throughout the city. Therefore, **the cumulative impact on schools and library services related to the LRDP and foreseeable future developments in San Francisco would be less than significant**.

4.12 UTILITIES AND SERVICE SYSTEMS

This section describes the major utilities and service systems related to the existing and proposed CPMC campus sites. Included are evaluations of the impacts of the CPMC *Long Range Development Plan* (LRDP) on water (supply, demand, and infrastructure), wastewater and stormwater, and solid waste. Mitigation measures are provided where applicable and cumulative impacts are considered. The utilities and service systems analyzed in this section were selected on the basis of discussions with the City and County of San Francisco's (City's) utility systems staff. (A discussion of electricity and natural gas usage at the CPMC campus sites is included in Section 4.17, "Mineral and Energy Resources.") Section 4.15, "Hydrology and Water Quality," of this EIR evaluates the related topics of hydrology and water quality, including the National Pollutant Discharge Elimination System (NPDES) stormwater permitting program.

4.12.1 ENVIRONMENTAL SETTING

Table 4.12-1, "Existing (2006) Annual Water Demand, Wastewater Volumes, and Solid Waste Generation and Recycling by CPMC Campus Location," summarizes existing conditions at the CPMC campus sites with regard to water demand, wastewater production, and solid waste. Water demand is a combination of actual and estimated demands for each location based on billing data from the San Francisco Water Department. Wastewater volumes are based on water usage and do not include stormwater. Solid waste generation and recycling are based on billing data provided by the solid-waste disposal companies that serve the campuses.

Table 4.12-1
Existing (2006) Annual Water Demand, Wastewater Volumes, and Solid Waste Generation and Recycling by CPMC Campus Location

Campus/Location	Water Demand (gallons)	Wastewater Volumes (gallons)	Solid Waste (pounds)	
			Generation	Recycling
Cathedral Hill[a]	25,559,000	23,002,800	325,584	NA
Pacific	31,663,000	28,497,000	3,221,000	255,000
California	24,115,000	21,703,000	3,302,000	271,000
Davies	21,267,000	19,140,000	997,000	315,792
St. Luke's	14,466,000	13,019,000	832,000	393,000
Total	**117,070,000**	**105,361,800**	**8,677,584**	**1,234,792b**

Notes: NA = not available
a Water demand for Cathedral Hill reflects land uses at the site of the proposed CPMC campus in 2006 (e.g., existing water demand reflects water use at such facilities as the Cathedral Hill Hotel, including the hotel's swimming pool, air conditioning, car wash, etc.)
b Total recycling for Pacific, California, Davies, and St. Luke's Campuses only.
Source: BKF Engineers. 2010 (March 1). CPMC LRDP EIR Existing and Forecasted Demand for Community Services Questions: CS-1, CS-2, CS-5, CS-6. Pleasanton, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available as part of the project file, in Case No. 2005.0555E.

REGIONAL WATER SYSTEM

The CPMC campus sites are served by the San Francisco Public Utilities Commission (SFPUC), which manages a complex regional water system that stretches from the Sierra Nevada to the Bay Area and serves 2.5 million residential, commercial, and industrial customers in the Bay Area and the Sierra Nevada foothills.[1] SFPUC's regional water system consists of three integrated water supply and conveyance systems: the Hetch Hetchy, Alameda, and Peninsula systems.

The regional water system provides wholesale water service to 27 Bay Area water agencies located in Alameda, San Mateo, and Santa Clara Counties (wholesale customers) and retail water service for the residents, businesses, and industries within the municipal boundaries of San Francisco (retail customers). The retail customers also include San Francisco International Airport and San Francisco County Jail in San Mateo County, the unincorporated Town of Sunol, Lawrence Livermore Laboratory, the Castlewood development in Alameda County, and Groveland Community Services District in Tuolumne County.

The discussion below provides background information related to the City's water sources, water demand, and water distribution and treatment facilities.

WATER SOURCES

Most of the water supply for SFPUC's regional water system originates in the upper Tuolumne River watershed high in the Sierra Nevada, remote from human development and pollution. This water source, referred to as Hetch Hetchy water, is transported in pipes and tunnels to the Bay Area, requiring only primary disinfection and pH adjustment to control pipeline corrosion.[2] SFPUC's Regional Water System (RWS) travels 160 miles via gravity from Yosemite to the Alameda East Portal at Sunol Valley. On average, the Hetch Hetchy Reservoir provides more than 85% of the water delivered to the Bay Area. During times of drought, the water received from the Hetch Hetchy system can amount to more than 93% of the total water delivered.[3]

On average, Bay Area reservoirs (Calaveras, San Antonio, Crystal Springs, San Andreas, Stone Dam, and Pilarcitos Reservoirs) provide approximately 15% of the water delivered by SFPUC's regional water system. Reservoir storage allows the system to carry over part of its water supply from year to year. The Alameda watershed, located in Alameda and Santa Clara Counties, collects surface water for storage in Calaveras and San

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1 San Francisco Public Utilities Commission. 2009a. SFPUC Web site. Available: http://www.sfgov.org/site/frame.asp?u=http://www.sfwater.org/. As cited in San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Draft Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Page III.Q-2.

2 San Francisco Public Utilities Commission. 2005 (December). 2005 Urban Water Management Plan for the City and County of San Francisco. San Francisco, CA. Available: http://sfwater.org/mto_main.cfm/MC_ID/13/MSC_ID/165/MTO_ID/286. Accessed September 2009.

3 Ibid.

Antonio Reservoirs. In addition, the Sunol Filter Galleries near the town of Sunol provide groundwater that contributes less than 1% of San Francisco's water supply. The Peninsula watershed in San Mateo County captures surface water for storage in lower and upper Crystal Springs and San Andreas Reservoirs, and in a smaller reservoir, Pilarcitos. The six total reservoirs in Alameda, Santa Clara, and San Mateo Counties capture rain and local runoff and store some Hetch Hetchy water. All local water from the Alameda and Peninsula watersheds water is treated and filtered before it is delivered.[4] A small portion of retail demand is met through locally produced groundwater, which is used primarily for irrigation at local parks and on highway medians, and recycled water, which is used for wastewater treatment process water, sewer box flushing, and similar washdown operations. SFPUC also retails groundwater (pumped from the Pleasanton well field) to the Castlewood development in Alameda County.

Water Demand

The regional water system provides wholesale water service to 27 Bay Area water agencies located in Alameda, San Mateo, and Santa Clara Counties (wholesale customers), and also provides retail water for the residents, businesses, and industries within the municipal boundaries of the City and County of San Francisco (retail customers). Retail customers in San Francisco obtain approximately 88% of their water from SFPUC's regional water system and the remaining 12% from locally produced groundwater and secondarily treated recycled water. Approximately two-thirds of wholesale water customers depend entirely on SFPUC for water; the other one-third are able to obtain some portion of their water from other sources.[5] These other sources include groundwater, local surface water, the Santa Clara Valley Water District, the State Water Project, and recycling.

System operations and the amount of water delivered to customers vary throughout the year based on seasonal demand and the availability of water. From 2002 to 2006, SFPUC, in collaboration with its wholesale customers and the Bay Area Water Supply and Conservation Agency,[6] conducted comprehensive planning studies to assess future water demands, as well as the potential for water conservation programs and the use of recycled water to offset demand for potable water. The studies indicated that total demand in SFPUC's entire service area (retail and wholesale demand) was approximately 366 million gallons per day (mgd) in 2000–2001. Total retail water demand is estimated to increase from 91.81 mgd in 2010 to approximately 93.42 mgd by 2030. Approximately 81.00 mgd would be purchased from the SFPUC system. The remaining 12.42 mgd would be met through other

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4 San Francisco Public Utilities Commission. 2005 (December). *2005 Urban Water Management Plan for the City and County of San Francisco*. San Francisco, CA. Available: http://sfwater.org/mto_main.cfm/MC_ID/13/MSC_ID/165/MTO_ID/286. Accessed September 2009.

5 Ibid.

6 The Bay Area Water Supply and Conservation Agency represents the interests of 24 cities and water districts, and two private utilities, that purchase water wholesale from the San Francisco regional water system.

supply sources available to customers, primarily water purchases from other agencies, customers' local groundwater sources, additional water recycling, and conservation.[7]

During drought periods, SFPUC may implement customer water rationing, as occurred during the 1987–1992 drought. System operations require more complex planning and system management during drought periods than during nondrought years. SFPUC uses a design drought, a planning and operation tool that water supply agencies use to define a reasonable worst-case drought scenario based on local hydrology, to establish design and operating parameters for the water system.[8] During nondrought years, SFPUC's regional water system has adequate water supplies to meet demands from both San Francisco and the region (retail and wholesale) through 2030. SFPUC anticipates that the system could meet 100% of demand during a single drought year, but not during a multiple-year drought. SFPUC is identifying new water supply sources that could generate up to 10 mgd of groundwater and recycled water, and establishing conservation programs to ensure that even in the case of a 3-year drought, SFPUC could meet at least 90% of its water demand.[9]

Table 4.12-1 (page 4.12-1) provides the current (2006) annual water demand for the site of each existing or proposed CPMC campus. Total water demand for the five campus locations was 117,070,000 gallons per year, or approximately 320,000 gallons per day.[10]

Water Supply Reliability Planning

To enhance the reliability of the regional water system, improve dry-year supplies, diversify the water supply portfolio, and meet projected wholesale and retail demands through 2030, SFPUC developed the Water System Improvement Program (WSIP), approved on February 28, 2005. Under the WSIP as originally developed, SFPUC proposed to meet the service area's projected 2030 average daily purchase requests (300 mgd) by increasing diversions from the Tuolumne River under its existing water rights, and by developing 10 mgd of new local resources through a combination of additional conservation, water recycling, and groundwater supply programs.[11] With further development and refinement, this earlier WSIP evolved to propose various water facility improvement projects to achieve stated public health, seismic safety, delivery reliability, and water supply goals. The WSIP also included provisions for obtaining additional supplies in dry years. The program EIR (PEIR) for the WSIP identified and analyzed potential impacts of the WSIP, including the additional diversion of an annual

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7 Ibid. PBS&J. 2009 (October). *Final Water Supply Availability Study for City and County of San Francisco.* Pages 29–30.

8 San Francisco Planning Department. 2008 (October 30). *Final Program Environmental Impact Report for the San Francisco* Public Utilities Commission's Water System Improvement Program. San Francisco, CA. Chapter 2, "Existing Regional Water System."

9 Ibid.

10 BKF Engineers. 2010 (March 1). CPMC LRDP EIR Existing and Forecasted Demand for Community Services Questions: CS-1, CS-2, CS-5, CS-6. Pleasanton, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available as part of the project file, in Case No. 2005.0555E.

11 San Francisco Planning Department. 2008 (October 30). *Final Program Environmental Impact Report for the San Francisco Public Utilities Commission's Water System Improvement Program*. San Francisco, CA. Chapter 2, "Existing Regional Water System." Planning Department case number 2005.1059E. Page 2-17.

average of 35 mgd of water from the Tuolumne River. Three variants and six alternatives, including various water supply combinations that could meet future demand, were analyzed as well. Impacts associated with the water supply decisions were analyzed at a project level of detail; all facility projects, including construction of projects to implement proposed local water supply projects, were analyzed at a program level.

After certification of the WSIP final PEIR by the Planning Commission, on October 30, 2008, SFPUC adopted a phased WSIP option (SFPUC Resolution No. 08-0200, October 30, 2008),[12] which included the following program elements:

- full implementation of all WSIP facility improvement projects;
- delivery of water supply to the regional water system's customers through 2018 with an average annual target for delivery of 265 mgd originating from the watersheds (184 mgd for wholesale customers and 81 mgd for retail customers);
- the following water supply sources:
  - 265 mgd average annual from SFPUC watersheds;
  - 10 mgd conservation, recycled water, and groundwater in San Francisco; and
  - 10 mgd conservation, recycled water, and groundwater in the wholesale service area;
- dry-year water transfers coupled with implementation of the Westside Groundwater Basin Conjunctive Use Project to ensure reliability in drought years;
- reevaluation of 2030 demand projections, regional water system purchase requests, and water supply options by 2018, and a separate SFPUC decision by 2018 regarding water deliveries after 2018; and
- a provision in the new water supply agreement between SFPUC and wholesale customers imposing financial penalties to limit water sales to an average annual 265 mgd from the SFPUC watersheds through 2018.

Thus, under the phased WSIP, SFPUC has voluntarily chosen to limit deliveries from the regional water system's surface water supplies. By December 31, 2018, SFPUC will reevaluate water demands and water supply options through 2030 in the context of then-current information. SFPUC will meet the projected 2018 demand (approximately 285 mgd) by capping deliveries from its regional water system at 265 mgd, with 184 mgd allocated to wholesale customers and 81 mgd allocated to retail customers.[13] The remaining 20 mgd of demand will be met through water conservation, recycling, and groundwater (10 mgd provided by wholesale customers

[12] San Francisco Public Utilities Commission. 2008a. San Francisco Public Utilities Commission Meeting Minutes (October 30). Available: http://sfwater.org/detail.cfm/MC_ID/18/MSC_ID/113/MTO_ID/369/C_ID/4229/Keyword/%2008-0200> Accessed on May 25, 2010.

[13] Ibid.; PBS&J. 2009 (October). *Final Water Supply Availability Study for City and County of San Francisco.* San Francisco, CA. Page 9.

and 10 mgd provided by local projects within San Francisco). Improved dry-year supplies will be provided via implementation of the Westside Groundwater Basin Conjunctive Use Project (in San Mateo County), and less than 2 mgd in water transfers. The 10 mgd of local supply committed to by SFPUC upon adoption of the phased WSIP will be provided through development of the local water supply improvements discussed below.

SFPUC is currently engaged in a systemwide WSIP to repair, replace, and seismically upgrade portions of the regional water system. The program includes improvements to the system's aging pipelines, tunnels, dams, reservoirs, pump stations, and storage tanks and is scheduled to be completed in 2015.

Local Water Supply Improvements

Groundwater

Early in its history, San Francisco made considerable use of local groundwater, springs, and spring-fed surface water, and in the 1930s pumping rates from the groundwater basin on the city's west side were reported to be up to a total of 6 mgd. However, since the development of surface water supplies in the Peninsula and Alameda watersheds and the subsequent completion of the Hetch Hetchy system in the 1930s, the use of groundwater for the water supply system has been minimal; groundwater is primarily used in San Francisco for irrigation purposes.[14]

San Francisco overlies all or part of seven groundwater basins: the Lobos, Marina, Downtown, and South Basins, located wholly within the city limits, and the Islais Valley, Westside, and Visitation Valley Basins, which extend south into San Mateo County. The portion of the Westside Basin aquifer located within San Francisco is commonly referred to as the North Westside Basin. Except for the Westside and Lobos Basins, groundwater in basins underlying San Francisco is insufficient for municipal supply because of the basins' low yield.[15] Local groundwater is used for irrigation purposes in some parks, as well as for nonpotable purposes at the San Francisco Zoo and Golden Gate Park.

SFPUC is currently studying implementation of the San Francisco Groundwater Supply Project, created as part of the WSIP, to expand use of local groundwater sources to provide ongoing supply and to improve reliability during droughts, maintenance conditions, earthquakes, or other emergencies. This project proposes the construction of up to six wells and associated facilities in the western part of San Francisco to extract up to 4 mgd of groundwater from the North Westside Basin for distribution in the city. The extracted groundwater would be treated, disinfected, and blended in small quantities with surface water supplies before entering the municipal drinking water system. Environmental review for this project began in early 2010 and is expected to continue into 2011.

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[14] Ibid.; PBS&J. 2009 (October). *Final Water Supply Availability Study for City and County of San Francisco.* Page 7.
[15] Ibid, page 7.

Recycled Water

From 1932 to 1981, San Francisco's McQueen Treatment Plant provided recycled water to Golden Gate Park for irrigation purposes. As a result of regulatory changes, the City closed the McQueen plant and discontinued use of recycled water in Golden Gate Park. Currently, disinfected secondary-treated recycled water from SFPUC's Southeast Water Pollution Control Plant is used on a limited basis for washdown operations in the combined sewer system and is also provided to construction contractors for dust control and other construction purposes. Current use of recycled water for these purposes in San Francisco is less than 1 mgd.[16]

In March 2006, SFPUC updated the *Recycled Water Master Plan for the City and County of San Francisco* (RWMP). The 2006 RWMP identified where and how the City could most feasibly develop recycled water in San Francisco and provided strategies for implementing those projects. SFPUC plans to continue to diversify San Francisco's water supply portfolio by increasing the use of local water sources, such as recycled water, groundwater, water conservation, and desalination.

The San Francisco Recycled Water Program currently includes the Westside, Harding Park, and Eastside Recycled Water Projects. These proposed projects would provide up to 4 mgd of recycled water to a variety of users in San Francisco. Recycled water would be used primarily for landscape irrigation, toilet flushing, and industrial purposes. Environmental review has been completed for Harding Park Project while the Westside Project is currently undergoing environmental review and design. The WSIP contains funding for planning, design, and environmental review of the San Francisco Eastside Recycled Water Project.

The Westside Recycled Water Project would provide recycled water to several sites on the west side of San Francisco. The system would produce recycled water at a proposed recycled-water treatment facility in Golden Gate Park for delivery to the San Francisco Zoo, Golden Gate Park, and Lincoln Park Golf Course for landscape irrigation and for nonpotable uses at the Zoo and Golden Gate Park, including the California Academy of Sciences. SFPUC has begun the project-specific environmental review for this project.

In addition, SFPUC has partnered with the North San Mateo County Sanitation District, located in Daly City, on the Harding Park Recycled Water Project. This project would use recycled water from the district to irrigate the Harding Park and Fleming Park Golf Courses in San Francisco. Daly City has completed the project-specific environmental review for the Harding Park Recycled Water Project, and the project is currently in the design phase. Currently, SFPUC is conducting a recycled water demand assessment on the east side of San Francisco. The eastside assessment examines the potential uses of recycled water for irrigation, toilet flushing, and commercial applications.

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[16] Ibid.; PBS&J. 2009 (October). *Final Water Supply Availability Study for City and County of San Francisco.* Page 8.

Water Conservation

SFPUC's demand management programs range from financial incentives for plumbing devices to improvements in the efficiency of system distribution. The conservation programs implemented by SFPUC are based on the California Urban Water Conservation Council's list of 14 best management practices (BMPs) identified by signatories of the *Memorandum of Understanding Regarding Urban Water Conservation in California*, executed in 1991.

In addition, SFPUC is increasing its water conservation programs in an effort to achieve new water savings by 2018, consistent with the phased WSIP. This City's conservation program is based on the 2004 report *City and County of San Francisco Retail Water Demands and Conservation Potential* that identified potential water savings and implementation costs associated with a number of water conservation measures. SFPUC's new water conservation programs include replacing toilets with high-efficiency toilets and using water-efficient irrigation systems in municipal parks. With its expanded conservation programs, SFPUC anticipates reducing gross per-household consumption (which includes both residents and nonresidents) from 91.5 gallons per day to 87.4 gallons per day by 2018, which would result in a conservation supply potential of approximately 4.0 mgd annually.[17]

Water Treatment Facilities

SFPUC's regional water system includes two treatment plants: Sunol Valley Water Treatment Plant (SVWTP) and Harry Tracy Water Treatment Plant (Harry Tracy WTP). Construction of the existing SVWTP, located in an unincorporated portion of Alameda County in the Sunol Valley within SFPUC's Alameda watershed, was completed in 1964, with a hydraulic capacity of 80 mgd. The hydraulic capacity of the plant was expanded to 160 mgd in 1975. The plant's primary purpose is to treat local water supplies from Calaveras and San Antonio Reservoirs. However, when needed, up to 160 mgd of normally unfiltered Hetch Hetchy water can be diverted to the SVWTP for treatment. Although the plant has a hydraulic capacity of 160 mgd, it is not equipped to provide full conventional treatment under all conditions. As originally constructed, the plant can only treat 160 mgd when raw water turbidity is low. Historically, lower treatment capacities at the SVWTP were acceptable for the SFPUC's water transmission system. However, changes in the Hetch Hetchy system and regulatory environment have redefined treatment requirements at the SVWTP. Promulgation of the Surface Water Treatment Rule in 1989 placed more stringent restrictions on unfiltered water supplies; specifically, filtration is required when the Hetch Hetchy water is highly turbid. To ensure treatment capacity into the future, SFPUC is currently completing environmental review of the SVWTP Expansion and Treated Water Reservoir Project, a proposal to upgrade the SVWTP to reliably treat 160 mgd and increase the storage capacity of treated water at the plant. The Sunol Valley Chloramination Facility provides secondary disinfection with chloramine, along with fluoride addition and pH

[17] Ibid; PBS&J. 2009 (October). *Final Water Supply Availability Study for City and County of San Francisco.* San Francisco, CA. Page 11.

adjustment for corrosion control, for both Hetch Hetchy water and treated water from the SVWTP before the water is conveyed to Bay Area customers.[18, 19]

The Harry Tracy WTP, formerly known as the San Andreas Filter Plant, was built in 1971 and expanded in 1988 and 1990. Located in unincorporated San Mateo County near the San Bruno and Millbrae city limits, this plant provides filtration, fluoridation, and disinfection for water collected in all of the Peninsula reservoirs. The Harry Tracy WTP has a hydraulic capacity of 180 mgd; however, in recent years SFPUC has come to consider its sustainable capacity to be 120 mgd. Additionally, during most winters, San Andreas Reservoir experiences blooms of filter-clogging algae that can limit plant production to 90–100 mgd for several weeks.

Treated water from the Harry Tracy WTP is also delivered to customers in northern San Mateo County and San Francisco. The Capuchino, Baden, and San Pedro Valve Lots, used to regulate flow and provide operational flexibility, are located along the pipeline alignment between the plant and San Francisco. Water from the Harry Tracy WTP is eventually delivered via San Andreas Pipelines Nos. 2 and 3 or the Sunset Branch Pipeline to the Sunset Reservoir or Merced Manor Reservoir in San Francisco.[20] SFPUC is also currently designing an expansion of the Harry Tracy WTP to reliably deliver 160 mgd, which would increase the total treatment capacity of the regional water system to 320 mgd. Proposed improvements involve improving water quality, increasing water delivery capability, and strengthening facilities with seismic upgrades.

These projects would further the delivery reliability goals identified as part of the phased WSIP by allowing SFPUC to deliver water to meet winter demands during maintenance periods and provide an emergency supply in the event of loss of the Hetch Hetchy system supply. In addition, SFPUC has initiated construction of the Tesla advanced disinfection treatment facility in Tracy, California, to provide advanced disinfection of water from the Hetch Hetchy system. When completed in 2011, the Tesla advanced disinfection treatment facility will be the nation’s largest ultraviolet disinfection treatment plant.

San Francisco Water Distribution Facilities

Treated water from the regional water system is distributed within San Francisco through a local distribution system. The system, developed between 1860 and 1960, includes 10 reservoirs and eight water tanks that store the water delivered by the regional water system. Its 18 pump stations and approximately 1,250 miles of pipelines deliver water to homes and businesses throughout San Francisco. The WSIP also includes improvements to the

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[18] San Francisco Planning Department. 2009 (June 3). *Draft Program Environmental Impact Report for the Sunol Valley Water Treatment Plant Expansion and Treated Water Reservoir.* San Francisco, CA. Chapter 3, “Project Description.”

[19] Ibid. San Francisco Planning Department. 2008 (October 30). *Final Program Environmental Impact Report for the San Francisco Public Utilities Commission’s Water System Improvement Program*.

[20] Ibid.

local distribution system, including seismic improvements to many of the pump stations and upgrades to reservoirs.

WASTEWATER AND STORMWATER

Wastewater Infrastructure and Treatment

SFPUC oversees San Francisco's wastewater and stormwater collection and conveyance infrastructure. This infrastructure consists of a combined sewer system, which collects both sewage and stormwater, conveying flows to facilities for treatment before discharge to San Francisco Bay or the Pacific Ocean through outfall structures along the shoreline. Discharges into the combined sewer are regulated under two individual NPDES permits (waste discharge requirements [WDRs]) issued by the San Francisco Bay RWQCB (discussed in detail in Section 4.15.2, "Regulatory Framework," of Section 4.15, "Hydrology and Water Quality)." San Francisco is divided into two major drainage areas, Oceanside and Bayside. Approximately 900 miles of underground sewer pipes and transport structures of various sizes are located throughout the city. The City's Southeast and Oceanside Water Pollution Control Plants operate year-round, while the North Point Water Pollution Control Plant operates only during wet weather.[21]

The Southeast Water Pollution Control Plant, built in 1952 and expanded between 1977 and 1982, is located on the east side of San Francisco near Third Street and Evans Avenue. The plant treats all eastside sewage flows during dry weather, including those from the site of the proposed Cathedral Hill Campus and the existing Pacific, Davies, and St. Luke's Campuses. The Southeast plant treats an average dry-weather flow of 65–70 mgd and can treat up to 250 mgd during wet weather (i.e., primary treatment capacity of 250 mgd and secondary treatment capacity of 150 mgd). Dry-weather effluent flows from the Southeast Water Pollution Control Plant that have undergone secondary treatment are discharged to San Francisco Bay through the Pier 80 Outfall.

The Oceanside Water Pollution Control Plant, the City's newest treatment facility, was completed in 1993. This facility, located near the San Francisco Zoo, serves the west side of the city, including the California Campus. The Oceanside plant operates with a design average dry-weather flow of 15–20 mgd and a peak wet-weather flow of 65 mgd (i.e., primary treatment capacity of 65 mgd and secondary treatment capacity of 43 mgd). The plant provides primary- and secondary-level treatment before discharging treated effluent to the Pacific Ocean through a 4.5-mile Southwest Ocean Outfall.

The North Point Water Pollution Control Plant has operated since 1951 and is located on Bay Street and the Embarcadero near lower Telegraph Hill. This facility provides primary treatment to combined flows collected

[21] San Francisco Public Utilities Commission. 2005 (December). *2005 Urban Water Management Plan for the City and County of San Francisco*. San Francisco, CA. Section 10, "Water Recycling." Available: http://sfwater.org/mto_main.cfm/MC_ID/13/MSC_ID/165/MTO_ID/286. Accessed September 2009.

during storms (including flows from the site of the proposed Cathedral Hill Campus and the existing Pacific, Davies, and St. Luke's Campuses) and has a treatment capacity of 150 mgd. Primary-treated wet-weather effluent is discharged to San Francisco Bay through outfalls at Piers 33 and 45.

In 2004–2005 approximately 107 mgd of wastewater in San Francisco was collected, treated, and discharged through outfalls. It is estimated that the five CPMC campus sites generate approximately 105,361,800 gallons of wastewater annually (see Table 4.12-1, page 4.12-1), or about 0.29 mgd. In 2006, the Pacific Campus accounted for most of the wastewater generated annually at the CPMC campuses, at approximately 27%. The existing land uses at the proposed Cathedral Hill Campus followed at 22%, and the California Campus accounted for 21%, the Davies Campus for 18%, and the St. Luke's Campus for 12% of the annual wastewater generated at the CPMC campus sites.[22]

Stormwater Infrastructure and Treatment

San Francisco watersheds drain to both San Francisco Bay and the Pacific Ocean, as well as to various lakes within the geographic boundaries of the city. As discussed previously, San Francisco's wastewater collection, treatment, and disposal system consists of a combined sewer system that collects and transports both sewage and stormwater in the same pipe. Most of San Francisco (90%) is served by a combined sewer system. Approximately 10% of the city is served by a separate storm sewer system or lacks stormwater infrastructure.[23]

The combined flows receive treatment at wastewater treatment plants (the Southeast, Oceanside, and North Point Water Pollution Control Plants, described above) before being discharged to San Francisco Bay and the Pacific Ocean. Conventional separate storm sewer systems provide no stormwater treatment, while combined sewer systems treat most urban runoff to secondary standards,[24] including the first flush and most additional stormwater runoff.

During storms, operators more than double the normal rate of wastewater treatment to treat wet-weather flows. The operators also start up the North Point facility during wet weather to provide primary-level treatment for combined storm flows; this facility provides primary treatment and disinfection capacity for an additional 150 mgd of wet-weather flows. The treatment process at the North Point facility consists of primary sedimentation, clarification, removal of floatables, disinfection, and dechlorination operations. All stormwater receives treatment

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[22] BKF Engineers. 2010 (March 1). CPMC LRDP EIR Existing and Forecasted Demand for Community Services Questions: CS-1, CS-2, CS-5, CS-6. Pleasanton, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available as part of the project file, in Case No. 2005.0555E.

[23] City of San Francisco, San Francisco Public Utilities Commission, and Port of San Francisco. 2009 (November). *Draft San Francisco Stormwater Design Guidelines*. San Francisco, CA. Available: http://sfwater.org/mto_main.cfm/MC_ID/14/MSC_ID/361/MTO_ID/543. Accessed December 2009.

[24] As defined by Title 40 Code of Federal Regulations Part 133.

in storage/transport boxes.[25] Treated flows from this facility are discharged through four deepwater outfalls, approximately 800 feet from the bay shoreline and 18 feet below mean low water. Two of the deepwater outfalls terminate at the end of Pier 33, and two terminate at the end of Pier 35 on the northeastern bay.

When wastewater flows exceed the system's total storage capacity, storage/transport boxes provide treatment consisting of settling and removal of floatable materials before shoreline discharge. During most rainstorms, stormwater flows do not fill the storage/transport boxes, and all the wastewater is held for later treatment. The solids retained in the storage/transport boxes are flushed to the treatment plants after storms.[26] However, when the capacity of the system is exceeded by large storm events, localized flooding and combined sewer discharges can occur. When a combined sewer discharge occurs, the system discharges a mixture of partially treated sanitary and stormwater effluent to receiving water bodies. These discharges consist of approximately 6% sewage and 94% stormwater. Such exceedances occur an average of one to 10 times per year, depending on location. Although these discharges are dilute, they can cause public health concerns and lead to beach or bay access closures.[27]

If the combined wet-weather flows exceed 150 mgd, the North Point Pollution Control Plant can also treat an additional 100 mgd to a primary treatment standard (removal of settleable materials) plus subsequent disinfection and dechlorination.[28] Wet-weather flows that are treated to the primary standard (plus disinfection) are discharged only from the Southeast Pollution Control Outfall (Pier 80 outfall). San Francisco operates the only municipal wastewater facilities in California where, on an annual basis, approximately two-thirds of the stormwater runoff receives secondary treatment.

The Bayside Wet Weather Facilities, during wet-weather conditions, provide storage and treatment that is equivalent to wet-weather primary treatment. During wet weather, the underground transport tunnels provide a total storage capacity of approximately 193 million gallons, while pumps continue to transfer combined wastewater and stormwater to the Southeast Water Pollution Control Plant. When the combined capacity of the Southeast Water Pollution Control Plant and the North Point Water Pollution Control Plant is exceeded, the wet-weather facilities retain storm flows for later treatment. The tanks allow floatable and settleable solid materials to be removed, similar to primary treatment processes. The materials retained in the storage and transport boxes are flushed to the treatment plants after storms.

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[25] San Francisco Public Utilities Commission. 2009b. Capturing and Storing Stormwater: Catch Basins and Storage Boxes Web site. Available: http://sfwater.org/mto_main.cfm/MC_ID/14/MSC_ID/117/MTO_ID/658. Accessed December 2009.

[26] City of San Francisco, San Francisco Public Utilities Commission, and Port of San Francisco. 2009 (November). *Draft San Francisco Stormwater Design Guidelines.* San Francisco, CA. Available: http://sfwater.org/mto_main.cfm/MC_ID/14/MSC_ID/361/ MTO_ID/543. Accessed December 2009. Appendix A, "Combined Sewer System."

[27] Ibid.

[28] San Francisco Public Utilities Commission. 2008b. Wastewater System Map. Available: http://sfwater.org/mto_main.cfm/MC_ID/14/MSC_ID/117/MTO_ID/218. Accessed November 6, 2008.

This level of treatment meets the minimum treatment specified by the U.S. Environmental Protection Agency (EPA) Combined Sewer Overflow Control Policy (CSO Policy) (see “Combined Sewer Overflow Control Policy” in Section 4.12.2, “Regulatory Framework,” page 4.12-15). If the capacities of the Southeast Pollution Control Plant, the North Point Water Pollution Control Plant, and wet-weather facilities and storage structures are exceeded, the combined stormwater and sewage receives the equivalent of wet-weather primary treatment in the transport structures/boxes, then is discharged into San Francisco Bay through any one of the 29 shoreline CSO structures. The outfalls associated with these CSO structures are very-wide-diameter pipes or box culverts. All solids that settle out in the storage/transport structures are flushed to the Southeast Pollution Control Plant after the rainstorm subsides.

SOLID WASTE

Collection and Disposal

Sunset Scavenger Company and Golden Gate Disposal & Recycling Company, subsidiaries of Recology (formerly Norcal Waste Systems, Inc.), handle solid waste collection services for residential and commercial garbage and recycling in San Francisco. Sunset Scavenger is San Francisco’s authorized collection company serving businesses in numerous neighborhoods stretching from the Golden Gate Bridge to Candlestick Park, such as the Sunset, Mission, and Bayview Districts; Noe Valley; Glen Park; the Presidio; Haight Ashbury; and Cole Valley. Golden Gate Disposal & Recycling is San Francisco’s authorized collection company, serving businesses in the Financial District and several contiguous neighborhoods: North Beach, South of Market, South Beach, Fisherman’s Wharf, and the Marina District. Golden Gate Disposal & Recycling also provides recycling services, including the Food Scrap Compost Program, to more than 100 businesses in Oakland and City offices.[29]

Residential and commercial solid waste collected by Sunset Scavenger and Golden Gate Disposal & Recycling is delivered to San Francisco Recycling and Disposal, Inc. (a.k.a. the San Francisco Dump), which is located directly across Tunnel Avenue, approximately 3 miles south of the St. Luke’s Campus. The maximum permitted throughput[30] is 275 tons per day with a permitted capacity of 54,600 tons per year.[31] Organic waste is sent to the Jepson Prairie composting facility, which has the capacity to process approximately 300 tons per day, or approximately 5,200 tons of food waste (food scraps) from commercial premises and 2,000 tons of green waste per month.

After the solid waste is sorted and recycled (i.e., diverted), the waste that is not diverted is transferred to the Altamont Landfill on Altamont Pass Road in Livermore, approximately 60 miles from San Francisco. Altamont

[29] SF Recycling. 2009a. Recology Web site. Available: http://www.sfrecycling.com/. Accessed September 2009.

[30] “Permitted throughput” is the maximum permitted amount of waste a landfill can handle and dispose of in one day. This figure is established in the current solid waste facilities permit issued by the California Integrated Waste Management Board.

[31] California Integrated Waste Management Board. 2007a. Facility/Site Summary Details: San Francisco Recycling & Disposal, Inc. Available: http://www.ciwmb.ca.gov/SWIS/38-AA-0017/Detail/. Accessed September 2009.

Landfill serves several jurisdictions, including several East Bay cities such as Oakland, Alameda, Emeryville, and Richmond; however, San Francisco is the largest single contributor to the landfill. In 2007, the volume of waste contributed by San Francisco represented approximately 41% of the total waste disposed of at this facility. The Altamont Landfill handles construction, demolition, and mixed municipal waste. This landfill comprises approximately 2,130 acres (472 acres of disposal area) and has a maximum permitted throughput of 11,150 tons per day and a maximum permitted capacity of 62,000,000 cubic yards, of which 73.7% (45.7 million cubic yards) remained as of August 2009.[32] The landfill is projected to have sufficient capacity to operate until at least 2032,[33] according to the California Integrated Waste Management Board (CIWMB) Solid Waste Information System (SWIS) database, if disposal were to continue at current rates; however, the Altamont Landfill is currently scheduled for closure on January 1, 2029.[34] In 1988, the City entered into an agreement with what is now Waste Management of Alameda for the disposal of 15 million tons of solid waste at Altamont. Through August 1, 2009, the City had used 12,579,318 tons of this capacity. The City projects that the remaining capacity will be reached no sooner than August 2014 (assuming an average of 467,000 tons a year disposal).[35]

The City has issued a request for qualifications to solicit bids for a new contract to accommodate San Francisco's disposal capacity beyond the expiration of the current agreement. The City has identified three landfills that have the capacity to meet the city's future needs and is in the final stages of the selection process, with an agreement to be ratified by the Board of Supervisors in 2010. The agreement will be for an additional 5 million tons of capacity, which could represent 20 or more years of capacity for San Francisco's waste. Future agreements will be negotiated as needed for San Francisco's waste disposal needs.

The San Francisco Department of the Environment (SF Environment) works with residents and businesses to promote waste reduction, reuse, and recycling throughout the city, to conserve valuable resources and reduce the amount of material that is sent to the landfill. In addition to maximizing waste prevention, SF Environment must meet a state-mandated requirement to divert 50% of disposed materials from landfills (see "California Solid Waste Reuse and Recycling Access Act" on page 4.12-18 in Section 4.12.2, "Regulatory Framework"). As part of the agreement with Altamont Landfill & Resource Recovery, which operates the Altamont Landfill, SF

[32] California Integrated Waste Management Board. 2009. Active Landfill Profile for Altamont Landfill & Resource Recovery (01-AA-0009). Available: http://www.ciwmb.ca.gov/Profiles/ Facility/Landfill/LFProfile1.asp?COID=1&FACID= 01-AA-0009. Accessed August 24, 2009. Landfill capacity is measured in cubic yards, since landfill capacity is more a function of volume than weight. Densities of constituents of municipal solid waste vary, while municipal solid waste is tracked in tons. For purposes of this analysis, known densities of materials types are utilized to calculate the amount of solid waste that the City contributes to the Altamont Landfill in cubic yards.

[33] California Integrated Waste Management Board. 2007b. Facility/Site Summary Details: Altamont Landfill and Resource Recovery. Available: http://www.ciwmb.ca.gov/SWIS/01-AA-0009/Detail/. Accessed September 2009.

[34] Assman, David. San Francisco Department of the Environment. August 11, 2009—phone communication. As cited in San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Draft Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Chapter III.Q, "Utilities," page III.Q-37.

[35] Assman, David. San Francisco Department of the Environment. October 19, 2009—e-mail communication. As cited in San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Draft Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Chapter III.Q, "Utilities," page III.Q-35-36.

Environment must also match Alameda County's diversion rate. Alameda County has set a goal of achieving a 75% waste diversion rate by 2010.[36]

It is estimated that in 2006, the CPMC campuses (including the site of the proposed Cathedral Hill Campus) generated a total of 8,677,584 pounds of mixed solid waste (Table 4.12-1, page 4.12-1). The Pacific and California Campuses accounted for 75% of the solid waste generated.

Hazardous Waste

Hazardous materials are governed by federal, state, and local regulations and are monitored by SFDPH. Hazardous, radiological, and medical wastes generated on the CPMC campuses are regulated under the authority of SFDPH's Hazardous Materials Unified Program Agency (HMUPA) under a compliance certificate. Additional oversight is provided by the Radiological Health Branch of the California Department of Public Health (DPH). With implementation of the proposed LRDP, these agencies' existing regulation of waste generation, storage, and disposal from the CPMC campuses would continue.[37] The topic of hazardous waste is addressed in detail in Section 4.16, "Hazards and Hazardous Materials."

4.12.2 REGULATORY FRAMEWORK

In addition to the discussion below, see the "Regulatory Framework" discussion in Section 4.15, "Water Quality and Hydrology," for a description of regulations related to the combined sewer systems and stormwater.

FEDERAL

Clean Water Act

In 1972 the Clean Water Act was enacted to regulate the discharge of pollutants to receiving waters such as oceans, bays, rivers, and lakes. The objective of the act is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" by regulating discharges of pollutants into the waters of the United States. The major federal legislation governing stormwater quality, the Clean Water Act established a two-phase plan to regulate runoff of polluted stormwater under the NPDES. EPA is the lead federal agency responsible for water quality management, and is authorized to implement pollution control programs such as setting wastewater standards for industry. The Clean Water Act also requires that water quality standards be set for all contaminants in surface waters.

[36] SF Environment. Zero Waste Goal. Available at http://www.sfenvironment.org/downloads/library/200200702.pdf. Accessed July 2010.

[37] San Francisco Department of Public Health. 2009. Hazardous Materials and Waste. Available: http://www.sfdph.org/dph/EH/HMUPA/default.asp#. Accessed September 2009.

Safe Drinking Water Act

Originally enacted in 1974, the Safe Drinking Water Act aimed to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and groundwater wells. The Safe Drinking Water Act authorizes EPA to set national health-based standards for drinking water to protect against both naturally occurring and human-made contaminants that may be found in drinking water.

Combined Sewer Overflow Control Policy

In 1994, EPA adopted the CSO Control Policy (50 *Federal Register* [FR] 18688; April 11, 1994), which established a two-phase control program for communities with combined sewer systems. In the first phase of this program, communities receiving permits from EPA for their combined sewer systems must implement a series of nine technology-based controls that have been designed to reduce the frequency of CSOs and limit their effects on receiving waters. These controls focus on pretreating both wastewater and stormwater runoff to remove pollutants before they reach the sewer, eliminating CSOs during dry weather, using storage to minimize wet-weather CSOs, controlling floatables and settleable solids within CSO discharges, and notifying the public when CSOs occur.

In the second phase, permittees also must either:

- ensure that, on average, no more than four CSO events will occur per year;
- provide primary treatment (remove floatables and settleable solids) for at least 85% of the total discharge; or
- remove enough pollutants before they enter the sewer system to prevent degradation of receiving waters.

Completion in 1997 of the improvements identified in the City's wastewater master plan has brought San Francisco into compliance with EPA's CSO Control Policy. These improvements consisted mainly of constructing storage culverts and installing discharge weirs (e.g., screens) and skimmers at all CSO outlets. The added storage reduced the frequency of CSOs, and the discharge facilities allow the City to provide at least primary treatment for 100% of its stormwater and wastewater discharges. Therefore, although the City averages approximately 10 CSOs each year, it is currently in compliance with the CSO Control Policy as a result of the removal of solids and the primary treatment provided.

STATE

Integrated Waste Management Act

Assembly Bill (AB) 939 and Senate Bill (SB) 1322, both signed into law in 1989 (Chapters 1095 and 1096, Statutes of 1989), are together known as the Integrated Waste Management Act. The act established the CIWMB as the state agency designated to oversee, manage, and track California's 92 million tons of waste generated each year. The Integrated Waste Management Act required California's 450 jurisdictions (i.e., cities, counties, and regional waste management compacts) to implement waste management programs. These programs aimed at ambitious marks: diversion of 25% of the waste stream by 1995 and a 50% diversion rate by 2000. In 2005, California diverted 52% of its waste stream.

Urban Water Management Planning Act

The Urban Water Management Planning Act (California Water Code, Section 10610 et seq.) was originally enacted in 1983 with the passage of AB 797 (Chapter 1009, Statutes of 1983) and subsequently amended. This law applies to urban water suppliers that serve 3,000 or more customers or provide more than 3,000 acre-feet of water annually. The Urban Water Management Planning Act states that such water suppliers should endeavor to ensure that their water service is reliable enough to meet the needs of their various categories of customers during normal, dry, and multiple dry years. The law also describes how urban water suppliers should adopt and implement urban water management plans (see "Urban Water Management Plan" on page 4.12-19 in the discussion of City/local regulations below.)

California Health and Safety Code

Section 64562 of the California Health and Safety Code establishes water supply requirements for service connections to public water systems. Before additional service connections can be permitted, enough water must be available to the public water system from its water sources and distribution reservoirs to adequately, dependably, and safely meet the total requirements of all water users under maximum-demand conditions.

Senate Bill 610

SB 610, signed into law in 2001 (Chapter 643, Statutes of 2001), amended Sections 10910–10915 of the California Water Code. The law requires public water systems to prepare water supply assessments for residential projects with more than 500 dwelling units or development projects meeting certain criteria defined in the Water Code. The water supply assessment must determine whether available water supplies are sufficient to serve the demand generated by the project along with the region's reasonably foreseeable cumulative demand under average-normal-year, single-dry-year, and multiple-dry-year conditions, as projected over a 20-year period.

The proposed CPMC LRDP does not meet the Water Code definition of a project requiring a water supply assessment.[38] However, the availability of a water supply adequate to serve the project was considered by SFPUC. This topic is discussed below in Section 4.12.5, "Impact Evaluations."

[38] San Francisco Public Utilities Commission. 2009c. Water Supply Assessment for Proposed California Pacific Medical Center (CPMC) Long Range Development Plan. September 15, 2009.

Senate Bill 1374

SB 1374, signed into law in 2002 (Chapter 501, Statutes of 2002), established requirements for diversion of construction and demolition waste. The law requires local agencies to describe their progress on waste diversion and recycling of construction and demolition materials in their annual reports to the CIWMB on compliance with the diversion goals of AB 939 (described above under “Integrated Waste Management Act”).

California Solid Waste Reuse and Recycling Access Act

AB 1327, signed into law in 1991 (Chapter 842, Statutes of 1991), is known as the California Solid Waste Reuse and Recycling Access Act of 1991. The act required that all California cities and counties divert 50% of all solid waste by January 1, 2000, through source reduction, recycling, and composting activities. Local agencies must develop and adopt ordinances requiring all development projects adopted on or after September 1, 1993, to provide adequate areas to collect and load recyclable materials.

CITY/LOCAL

San Francisco Board of Supervisors Resolution Number 679-02

Resolution 679-02, adopted by the San Francisco Board of Supervisors in September 2002, established a Citywide landfill diversion goal of 75 percent by the year 2010 and a long-term zero waste (100 percent diversion) goal. The San Francisco Department of the Environment passed Resolution 002-03-COE in March 2003, setting a target date of 2020 for achieving zero waste.

San Francisco Construction and Demolition Ordinance No. 27-06

The City adopted an ordinance (No. 27-06), effective July 1, 2006, that creates a mandatory program to maximize the recycling of mixed construction and demolition (C&D) debris (such as wood, metal, concrete, asphalt, and Sheetrock). This ordinance applies to all commercial and residential indoor and outdoor construction projects (repairs, improvements, additions, remodeling, and demolitions). Under the ordinance, C&D debris transported off-site must go to a registered construction recycling facility, not a landfill, and must be hauled by a registered transporter. Facilities receiving C&D debris must be able to process these materials and divert a minimum of 65% of the materials from the landfill. San Francisco Recycling and Disposal, Inc., operates a registered facility specifically designed to recycle construction debris. Sunset Scavenger Company and Golden Gate Debris Box Service are registered transporters that regularly deliver loads to this recycling facility.[39]

[39] SF Recycling. 2009b. Commercial Collection Overview. Available: http:// www.sfrecycling.com/commercialServices.php. Accessed October 2009.

San Francisco Food Service Waste Reduction Ordinance No. 295-06

The City adopted an ordinance (No. 295-06), effective June 1, 2007, to prohibit any retail food vendor operating in San Francisco from using disposable polystyrene food service ware. It requires the use of "a suitable affordable alternative biodegradable/compostable or recyclable product" unless no suitable product is available.

San Francisco Mandatory Recycling and Composting Ordinance No. 100-09

The City adopted an ordinance (No. 100-09), effective June 23, 2009, to "require all persons located in San Francisco to separate recyclables, compostables, and landfilled trash and participate in recycling and composting programs." This ordinance covers any "property where refuse is generated…including schools, institutions, and City properties."

Recycled Water Policy

SFDPH requires all recycled water to be treated to meet the standards set forth in Title 22 of the California Code of Regulations, which differ according to the proposed use of the water. CPMC may use grey water at its medical facilities so long as it receives approval from DPH; Sections 13550–13557 of the California Water Code do not strictly forbid the use of grey water derived from a medical facility.

Urban Water Management Plan

SFPUC adopted the *Urban Water Management Plan for the City and County of San Francisco* in December 2005. The *Urban Water Management Plan* describes SFPUC's water supplies and assesses the reliability of those supplies under drought conditions. The UWMP forecasts a slight increase in residential water demand as a result of San Francisco's estimated 15% population growth between 2005 and 2030. The demand is expected to be offset by increased efficiency (e.g., more efficient plumbing in newer and remodeled housing). As population grows, so does the demand for health care. The UWMP forecasts increased water usage for "services," which includes health care.

Sewer System Master Plan

In 2005, SFPUC began the procedures to update the *San Francisco Sewer System Master Plan*, which is to be a comprehensive plan that charts the long-term vision and strategy for the City's management of wastewater and stormwater.[40] The completed master plan will provide improved procedures to address the wastewater system's challenges, with the intention of maximizing system reliability and flexibility. Low Impact Development (LID) design is presented in the plan as a major tool for addressing the City's drainage management needs. This innovative stormwater management approach is modeled after nature: it advocates managing runoff at its source

[40] San Francisco Public Utilities Commission. 2009d. Sewer System Master Plan – Current Status Website. Available: http://sfwater.org/mto_main.cfm/MC_ID/14/MSC_ID/120/MTO_ID/677. Accessed September 2009.

using decentralized micro-scale facilities. The master plan contains protocols for using LID in ongoing repair and replacement projects as a part of SFPUC's overhaul of drainage infrastructure.

The *San Francisco Sewer System Master Plan* is currently undergoing environmental review, which is anticipated to be complete in 2011. The review process, led by the San Francisco Planning Department's Major Environmental Analysis Division (MEA), will identify environmental impacts of proposed actions, identify ways to avoid or reduce environmental damage, and enhance public participation in the planning process.[41]

San Francisco Stormwater Design Guidelines

SFPUC and the Port of San Francisco (Port) administer stormwater management programs developed in accordance with the federal CWA and a State of California NPDES permit. In November 2009, the Port and SFPUC released new stormwater management guidelines. SFPUC's *San Francisco Stormwater Design Guidelines* detail the engineering, planning, and regulatory framework for designing new infrastructure in a manner that reduces or eliminates pollutants commonly found in urban runoff.[42] Applying to development and redevelopment projects disturbing more than 5,000 square feet, these guidelines are focused primarily on the separate storm sewer (MS4) areas of San Francisco, but the thresholds and general strategies described to achieve compliance also apply to combined sewer areas.

Although the thresholds and strategies are the same for both combined and separate sewers, the performance measures are different. In combined sewer areas under SFPUC jurisdiction, applicants must reduce the flow rate and volume of stormwater going into the combined system by achieving Leadership in Energy and Environmental Design (LEED®) Sustainable Sites (SS) Credit 6.1, "Stormwater Design: Quantity Control." LEED® SS Credit 6.1 states that for sites where the existing imperviousness is greater than 50%, the project must "implement a stormwater management plan that results in a 25% decrease in the volume of stormwater runoff from the two-year 24-hour design storm."[43] The intent of LEED® SS Credit 6.1 is to limit disruption of natural water hydrology by managing stormwater runoff to reduce impervious cover, increase on-site infiltration, reduce or eliminate pollution from stormwater runoff, and eliminate contaminants.

The *San Francisco Stormwater Design Guidelines* encourage the use of LID to comply with stormwater management requirements. LID applies decentralized site strategies to manage the quantity and quality of

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[41] San Francisco Public Utilities Commission. 2005 (December). *2005 Urban Water Management Plan for the City and County of San Francisco.* San Francisco, CA. Available: http://sfwater.org/mto_main.cfm/MC_ID/13/MSC_ID/165/MTO_ID/286. Accessed September 2009.

[42] City of San Francisco, San Francisco Public Utilities Commission, and Port of San Francisco. 2009 (November). *Draft San Francisco Stormwater Design Guidelines*. San Francisco, CA. Available: http://sfwater.org/mto_main.cfm/MC_ID/14/MSC_ID/361/MTO_ID/543. Accessed February 8, 2010. Page 1.

[43] U.S. Green Building Council. 2009. *LEED® Reference Guide for Green Building Design and Construction.* Washington, DC. Page 91.

stormwater runoff and includes BMPs such as cisterns, green roofs, bioretention basins and planters, permeable pavement, and infiltration trenches.

In addition, the *San Francisco Stormwater Design Guidelines* require development of an operations and maintenance plan that identifies responsible parties, funding sources, maintenance activities, and schedules for all BMPs. The San Francisco Board of Supervisors adopted the *San Francisco Stormwater Design Guidelines* in the form of the San Francisco Stormwater Management Ordinance on April 6, 2010.[44] Adoption and implementation of this ordinance will improve San Francisco's environment by reducing pollution in stormwater runoff in areas of new development and redevelopment. SFPUC staff members are currently developing additional guidance for achieving LEED® SS Credit 6.1 in combined sewer areas.

San Francisco Electricity Resource Plan

In December 2002 the San Francisco Board of Supervisors approved the *San Francisco Electricity Resource Plan* as the City's official blueprint for electricity resource planning. Drafted jointly by SFPUC's Power Enterprise and SF Environment, the plan provides a long-term vision of San Francisco's possible electricity future. Its companion document, the *Energy Resource Investment Strategy*, provides analysis and technical recommendations for the future use of energy resources within San Francisco.

City Energy Programs

The City also has several programs to further promote energy conservation among residents and businesses. The San Francisco Energy Watch Program offers businesses and owners of multifamily properties free consultation related to energy-efficient appliances, as well as other rebates, audits, and incentives, and installation at a reduced fee. Equipment types covered by the Energy Watch Program include lighting; domestic hot water; heating, ventilation, and air conditioning (HVAC) units; and laundry machines.[45]

Green Building Policies

On November 3, 2008, the San Francisco Building Code was amended to include Chapter 13C, "Green Building Requirements," known as the Green Building Ordinance.[46] The purpose of the requirements is to promote the health, safety, and welfare of San Francisco residents, workers, and visitors by minimizing the use and waste of energy, water, and other resources in the construction and operation of the city's buildings, and by providing a healthy indoor environment. The ordinance requires compliance with the applicable LEED® performance standards for new construction, Version 2.2; however, building permits for acute-care facilities, such as the

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[44] San Francisco Public Utilities Commission. 2010. Stormwater Management Ordinance (April 6, 2010).

[45] San Francisco Planning Department. 2008 (June 19). *Final Environmental Impact Report for the San Francisco General Hospital Seismic Compliance Hospital Replacement Program.* San Francisco, CA. Chapter J, "Utilities, Services, and Energy."

[46] San Francisco Building Inspection Commission Codes. 2008. Chapter 13C, "Green Building Requirements," Section 1304C.0.3. Available: www.sfenvironment.org/downloads/library/sf_green_building_ordinance_2008.pdf. Accessed February 8, 2010.

Cathedral Hill Hospital and St. Luke's Replacement Hospital, are under the Office of Statewide Health Planning and Development jurisdiction and, as such, are not subject to the Green Building Ordinance. In addition, a site permit application for the Neuroscience Institute building at Davies Campus was filed prior to the adoption of the Green Building Ordinance. Therefore, the Green Building Ordinance also does not apply to the Neuroscience Institute building. However, the Cathedral Hill MOB, the St. Luke's MOB/Expansion Building, and all long-term facilities proposed as part of the LRDP will be subject to the Green Building Ordinance.

CUMULATIVE CONDITIONS

Water

SFPUC's regional water system provides water to 2.5 million people, as well as retail and wholesale customers in San Francisco, San Mateo, Santa Clara, Alameda, and Tuolumne Counties. As part of its planning for future water supply needs, SFPUC has conducted comprehensive planning studies to assess water demands to 2030. To update the water supply and demand estimates provided in the 2005 update of the UWMP, SFPUC developed a water supply availability study.[47] The water supply availability study incorporates new water supply information (per the phased WSIP) and generates new estimates of future water demand for San Francisco. The future water demand estimates are based on the most current population and employment estimates, which include major development proposals not anticipated in the 2005 UWMP. SFPUC currently delivers, on an annual average, approximately 265 mgd from local watersheds (Peninsula and Alameda Creek) and the Tuolumne River watershed. By 2030, demand on the SFPUC system is expected to increase to annual average of 300 mgd. The findings of the 2009 water supply availability study are as follows:

- In years of average and above-average precipitation and including development of SFPUC's local WSIP water supply sources, SFPUC has adequate supplies to serve 100% of demand in normal, single dry, and multiple dry years up to 2030.

- In multiple dry-year events after 2030, when SFPUC imposes reductions in its supply, SFPUC has in place its *Water Shortage Allocation Plan* and *Regional Water Shortage Allocation Plan* to balance supply and demand.

- If use of recycled water is implemented as proposed at each of the major development project sites, then it is assumed that San Francisco's potable water demands can decrease by up to 1.5 mgd, thereby eliminating potential deficits in multiple dry years after 2030.

- With the *Water Shortage Allocation Plan* and *Regional Water Shortage Allocation Plan* in place and the addition of local WSIP supplies, SFPUC has sufficient water supplies available to serve its existing retail customers and planned future uses.

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[47] Ibid.; PBS&J. 2009 (October). *Final Water Supply Availability Study for City and County of San Francisco.* San Francisco, CA. Pages 9, 32.

WASTEWATER AND STORMWATER

SFPUC's *San Francisco Sewer System Master Plan* is under development and is expected to address the need for additional sewer system capacity for planned future development through capital improvements. Individual projects will likely be required to provide on-site treatment and reduce peak runoff from storm events. The City's intent for stormwater design guidelines is for new projects to contribute to incremental improvements that would restore natural hydrologic functions in the watershed.

SOLID WASTE

San Francisco's solid waste goes to the Altamont Landfill. According to the CIWMB SWIS database, the landfill would reach capacity in January 2032 if disposal were to continue at current rates; however, the Altamont Landfill is currently scheduled for closure on January 1, 2029.[48] This landfill has and will have the capacity to meet the project's solid waste needs, especially in light of the City's green building policies and solid waste diversion and reduction goals, subject to contract limits established by the City's agreement with Waste Management of Alameda, as described above.

4.12.3 SIGNIFICANCE CRITERIA

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been adopted and modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the project would result in a significant impact on utilities and service systems. Implementation of the proposed project would have a significant effect on utilities and service systems if it would:

- 12a—exceed wastewater treatment requirements of the applicable RWQCB;
- 12b—require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- 12c—result in a determination by the wastewater treatment provider that serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- 12d—require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;

[48] Assman, David. San Francisco Department of the Environment. August 11, 2009—phone communication. As cited in San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Draft Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Chapter III.Q, "Utilities," page III.Q-37.

- 12e—have insufficient water supplies available to serve the project from existing entitlements and resources, or require new or expanded entitlements;
- 12f—be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs; or
- 12g—not comply with federal, state, and local statutes and regulations related to solid waste.

4.12.4 IMPACT EVALUATIONS

METHODOLOGY

The analysis of utilities impacts involved reviewing maps, land use plans, and technical data summarizing utilities in the vicinity of the existing and proposed CPMC campus sites. The analysis used available, existing data to characterize existing conditions and estimate water demand, wastewater generation, landfill capacity, and solid waste generation. Existing water demand used for the analysis was a combination of actual and estimated demands for each location based on billing data from the San Francisco Water Department. Existing wastewater volumes were based on water usage and do not include stormwater. The stormwater evaluation relies on the analysis conducted for Section 4.15, "Hydrology and Water Quality." Existing solid waste generation and recycling were based on billing data provided by the solid-waste disposal companies that serve the campuses.

Changes in water demand, wastewater generation, and solid waste generation associated with the proposed LRDP were estimated based on the estimated daily population and beds at each of the campuses at buildout (2030). Changes in wastewater and stormwater quality were qualitatively evaluated based on changes in land use, impervious surface, and building use.

The water supply analysis evaluated impacts based on the overall water use changes at all five CPMC campus sites because of the regional nature of water supply. Wastewater impacts were evaluated by campus because the campuses drain to different wastewater treatment plants.

IMPACT UT-1

The project would not exceed wastewater treatment requirements of the applicable regional water quality control board. (Significance Criterion 12a)

Levels of Significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without project variants): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

The quality of wastewater discharged from the CPMC campuses after completion of construction would not differ substantially from existing conditions. LRDP construction at the Cathedral Hill, Davies, and St. Luke's Campuses would include grading and other construction activities, as discussed for each campus under "Construction Schedule and Activities" in Chapter 2, "Project Description" (Sections 2.2.3, 2.5.3, and 2.6.3, on pages 2-38, 2-149, and 2-187, respectively), that could temporarily degrade the quality of stormwater discharges to the combined sewer system. However, as discussed in Impact HY-3 in Section 4.15, "Hydrology and Water Quality" (page 4.15-34), CPMC would comply with City requirements by preparing a storm water pollution prevention plan (SWPPP) for each campus and incorporating construction BMPs. The changes in the uses within the buildings on the existing and proposed CPMC campuses would not substantially change the quality of wastewater discharged from the buildings. Implementing near-term projects at the Davies and St. Luke's Campuses would add some new buildings supporting medical uses similar to the existing uses at those campuses. The Cathedral Hill Campus would experience the biggest change in type of use under the LRDP, changing from a hotel and office building to a hospital. The proposed Cathedral Hill MOB would replace seven existing buildings whose present uses include retail, nightclubs, a restaurant, residential units, and two residential hotels. However, this change of uses would not adversely alter the quality of wastewater discharged from the Cathedral Hill Campus such that the receiving wastewater treatment plant would be at risk of violating treatment requirements. Hazardous materials and pharmaceuticals used within CPMC medical buildings would be handled and disposed of properly such that they would not reach the wastewater system. As discussed in Impact HZ-2 on page 4.16-53 in Section 4.16, "Hazards and Hazardous Materials," although hazardous materials and wastes would be routinely stored and used at the proposed Cathedral Hill Campus in amounts substantially larger than existing conditions, these materials would be properly stored, used, and disposed of in accordance with current CPMC permits. The storage, use, and disposal of wastes would continue to be regulated under the authority of the San Francisco HMUPA under a compliance certificate, with additional oversight by the DPH Radiological Health Branch. As a result, implementing the LRDP would not result in an exceedance of the San Francisco Bay RWQCB's wastewater treatment requirements in the near term. **This impact would be less than significant.**

Cathedral Hill and St. Luke's Campuses with Project Variants: None of these project variants proposed for the Cathedral Hill and St. Luke's Campuses would result in any changes to stormwater discharges or building uses relative to the projects proposed for the respective campuses; therefore, this impact would be similar to the impact of near-term projects discussed above. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, and St. Luke's Campuses in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

The changes in the uses within the CPMC campus buildings with implementation of long-term projects under the LRDP would not substantially change the quality of wastewater discharged from the Pacific and Davies campuses. Implementing long-term projects at the Pacific and Davies Campuses would add some new buildings supporting medical uses similar to the existing uses at those campuses. As discussed above, CPMC would comply with City requirements by preparing a storm water pollution prevention plan (SWPPP) for each campus and incorporating construction BMPs. The changes in the uses within the buildings on the existing and proposed CPMC campuses would not substantially change the quality of wastewater discharged. As a result, implementing the LRDP would not result in an exceedance of the San Francisco Bay RWQCB's wastewater treatment requirements. This long-term impact is identical to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific Campus or Davies Campus in the long term.

IMPACT UT-2

The project would not require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. (Significance Criterion 12b)

Levels of Significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variants): Less than significant*

To evaluate potential impacts of both near-term and long-term projects on existing water infrastructure, current water use was compared to projected future water demands for each of the existing and proposed CPMC campuses, both individually and in combination. The City, through SFPUC, owns and operates a regional water system that serves 2.5 million people, primarily in San Francisco and on the Peninsula. SFPUC serves its retail and wholesale water demands with an integrated operation of local Bay Area water production and imported water from the Hetch Hetchy Water and Power (HHWP) Project. A study conducted by SFPUC, in collaboration with the Bay Area Water Supply and Conservation Agency, indicated that total water demand in SFPUC's entire service area was about 366 mgd in 2000–2001.

According to data received from the San Francisco Water Department, in 2006 total water demand for all five CPMC campuses (including the California Campus) was 117,070,000 gallons per year (i.e., approximately 0.32 mgd). Table 4.12-2, "Existing and Projected Total Annual Water Demands by CPMC Campus," provides annual water demands for each campus for 2006 and 2030.

Table 4.12-2
Existing and Projected Total Annual Water Demands by CPMC Campus

Campus/Location	Annual Water Demands (million gallons)	
	Existing—2006	Future[1]—2030
Cathedral Hill[2]	25.6	54.2
Pacific	31.7	12.4
California	24.1	4.7
Davies	21.3	19.3
St. Luke's	14.5	11.1
Total—All Campuses	117.1	101.7

Notes:
1 Projections of future water demand are based on the estimated number of employees and estimated in-use beds on each campus in 2020.
2 Existing water demand for Cathedral Hill reflects land uses at the site of the proposed CPMC campus in 2006 (e.g., existing water demand reflects water use at such facilities as the Cathedral Hill Hotel, including the hotel's swimming pool, air conditioning, car wash, etc.)
Source: BKF Engineers. 2010 (March 1). CPMC LRDP EIR Existing and Forecasted Demand for Community Services Questions: CS-1, CS-2, CS-5, CS-6. Pleasanton, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available as part of the project file, in Case No. 2005.0555E.

As shown in Table 4.3-7, "CPMC Household and Population Growth Projections for San Francisco" (page 4.3-8), there would be a net increase of 3,478 residents (accounting for 3% of projected population growth for San Francisco between 2006 and 2030) at full build out. However, due to compliance with city regulations designed to reduce water demand (discussed in detail below), total water use volumes would decrease.

In addition, as explained in Section 4.3, "Population, Employment, and Housing" (beginning on page 4.3-2), implementing the proposed LRDP would not induce growth above existing forecasts by the Association of Bay Area Governments (ABAG) for regional population growth; therefore, implementation of the LRDP would not result in additional residential water demand beyond what has already been included in the Urban Water

Management Plan and Water Supply Assessment.[49] Therefore, this analysis focuses on changes in water use at each of the five campuses.

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

As stated above, water users at the existing and proposed CPMC campuses currently consume a total of approximately 117 million gallons of water annually. The total water demand at the existing CPMC campuses (including the California Campus) would decrease by 15.4 million gallons of water annually by 2030 primarily because of the elimination of hospitals at the California and Pacific Campuses. However, water demand at the location of the proposed Cathedral Hill Campus is expected to increase by 28.6 million gallons per year with the development of the proposed Cathedral Hill Hospital and Cathedral Hill Medical Office Building (MOB) and renovation of the Pacific Plaza Office Building to become the 1375 Sutter MOB. Overall, by 2030, annual water demand from all CPMC campuses is expected to show a net decrease of 15.4 million gallons from 2006 figures as a result of the LRDP.

SFPUC would supply the necessary water to all of the CPMC campuses. Future water demand is based on population projections at buildout of the *San Francisco General Plan*. SFPUC's 2005 UWMP projects water use in San Francisco through year 2030. The water use projections in the 2005 UWMP are related to population and business trends forecasted by ABAG's *Projections 2002* and the San Francisco Planning Department's *Land Use Allocation 2002* projections. The San Francisco Public Utilities Commission prepared an updated Water Supply Availability Study adjusting growth projections through year 2030.[50] In a letter dated September 15, 2009, SFPUC confirmed to the San Francisco Planning Department that SFPUC has included the water demands associated with the proposed CPMC LRDP in San Francisco's future water demands and that the LRDP would not result in a requirement for major expansion of the water utility system.[51]

As required by San Francisco's Stormwater Management Ordinance,[52] redevelopment projects within combined sewer areas that disturb more than 5,000 sq. ft. must comply with LEED® Sustainable Sites Credit 6.1. If the site has an existing imperviousness greater than 50%, the project must "implement a stormwater management plan

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[49] San Francisco Public Utilities Commission, 2009c. Water Supply Assessment for Proposed California Pacific Medical Center (CPMC) Long Range Development Plan. September 15, 2009.

[50] PBS&J, 2009. Final Water Supply Availability Study for City and County of San Francisco. Prepared for San Francisco Public Utilities Commission. October 2009.

[51] San Francisco Public Utilities Commission. 2009e (September 15). Letter to San Francisco Planning Department regarding water supply assessment for proposed CPMC *Long Range Development Plan*. From Paula Kehoe, Director of Water Resources, San Francisco Public Utilities Commission. San Francisco, CA.

[52] San Francisco Public Utilities Commission. 2010. Stormwater Management Ordinance (April 6, 2010).

that results in a 25% decrease in the volume of stormwater runoff from the 2-year 24-hour design storm."[53] If the site has 50% or less imperviousness, then the site must "implement a stormwater management plan that prevents the postdevelopment peak discharge rate and quantity from exceeding the predevelopment peak discharge rate and quantity for the 1- and 2-year 24-hour design storms." The Stormwater Management Ordinance requires that a stormwater control plan be prepared that locates and sizes source control and treatment BMPs, along with maintenance and operation agreements. Compliance with this regulation may reduce water demand through the capture and reuse of rainwater for nonpotable uses. CPMC would comply with City regulations for stormwater management; however, the precise type, size, and routing of stormwater BMPs, including cisterns, have not yet been identified. A more detailed hydrologic analysis, including an evaluation of rainwater capture and reuse potential, would be completed during the preparation of the stormwater control plan and submitted for approval with the final construction drawings.

In addition, CPMC intends to attain LEED® Silver certification for the proposed Cathedral Hill MOB and St. Luke's MOB/Expansion Building by incorporating LEED® Silver design standards into these buildings, in addition to all new buildings constructed as part of long-term projects. CPMC also intends to attain a LEED Certified rating for the proposed Cathedral Hill Hospital and the St. Luke's Replacement Hospital.

Therefore, implementation of the proposed LRDP would not require new water facilities or the expansion of existing facilities. **This impact would be less than significant.**

Cathedral Hill and St. Luke's Campuses with Project Variants: Removing the pedestrian tunnel from near-term projects at the proposed Cathedral Hill Campus under the project variant would not change water demand at this campus relative to the project as proposed because no new building would be constructed at the site of the proposed tunnel. Neither the utility relocation or emergency department relocation variants for the St. Luke's Campus would change the type or intensity of land uses, so water demand at this campus would not change. As a result, with implementation of any of the project variants, this impact would be identical to the impact of near-term projects discussed above. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, and St. Luke's Campuses in the near term.

[53] U.S. Green Building Council. 2009. *LEED® Reference Guide for Green Building Design and Construction.* Washington, DC. Page 91.

Long-Term Projects

◆ Pacific and Davies Campuses

This long-term impact is similar to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. By 2030, annual water demand from the Pacific and Davies Campuses is expected to show a net decrease of 21.2 million gallons from 2006 figures as a result of the LRDP. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific or Davies Campuses in the long term.

IMPACT UT-3

The project would not require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. (Significance Criterion 12c)

Levels of Significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variants): Less than significant*

To evaluate potential impacts on existing wastewater infrastructure, current wastewater volumes were compared to projected wastewater volumes for each CPMC campus. As discussed previously, the campuses are within the City's combined sewer system. This means that both domestic wastewater and stormwater flow to the sewers. In combined sewer systems, there can be substantial differences in flows under dry-weather and wet-weather conditions. Wet-weather flows are often considerably greater than dry-weather flows and are dominated by stormwater runoff. For this analysis, two components of wastewater flows were considered: wastewater from the CPMC facilities and stormwater from the CPMC campuses. Changes in wastewater flows from the CPMC facilities were assumed to represent changes to baseline wastewater discharges occurring during both dry weather and wet weather. Changes in stormwater flows were assumed to only affect wet-weather conditions at wastewater treatment plants.

Sewer service to the CPMC campuses would be provided via connections to existing wastewater lines. Wastewater generated at the campus sites is treated by San Francisco's pollution control system, which consists of the Southeast, North Point, and Oceanside Water Pollution Control Plants. The Cathedral Hill, Pacific, Davies, and St. Luke's Campuses are serviced by either the Southeast or North Point Water Pollution Control Plant. (The California Campus is serviced by the Oceanside plant.) SFPUC typically estimates that 90% of total domestic water used in San Francisco ends up as wastewater.[54]

Table 4.12-3, "Existing and Projected Total Annual Wastewater Volumes at Each CPMC Campus (not including stormwater)," provides projections for annual wastewater volumes for each campus (exclusive of stormwater). Combined, the existing and proposed CPMC campuses currently produce approximately 105.4 million gallons of wastewater annually (approximately 289,000 gallons per day). Stormwater inflow to the combined sewer from each campus is not included in Table 4.12-3 because runoff from each campus site is not currently monitored and stormwater management elements, such as cisterns and raingardens, have not been sized and located on each campus.

Table 4.12-3
Existing and Projected Total Annual Wastewater Volumes at Each CPMC Campus (not including stormwater)

Campus/Location	Annual Wastewater Volumes[1] (million gallons)	
	Existing—2006	Future—2030
Cathedral Hill[2]	23.0	48.8
Pacific	28.5	11.2
California	21.7	4.2
Davies	19.1	17.4
St. Luke's	13.0	10.0
Total—All Campuses	**105.4**	**91.5**

Notes;
[1] Wastewater volume assumed to be 90% of water demand for all uses.
[2] Existing wastewater volumes for Cathedral Hill reflect land uses at the site of the proposed CPMC campus in 2006 (e.g., the Cathedral Hill Hotel, 1255 Post Street Office Building and buildings at the MOB site).
Source: BKF Engineers. 2010 (March 1). CPMC LRDP EIR Existing and Forecasted Demand for Community Services Questions: CS-1, CS-2, CS-5, CS-6. Pleasanton, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available as part of the project file, in Case No. 2005.0555E.

Although there would be a net increase of 3,478 residents (accounting for 3% of projected population growth for San Francisco by 2030), with compliance with City regulations (discussed in detail below), total wastewater volumes related to residential population growth resulting from implementation of the LRDP would decrease.

In addition, as explained in Section 4.3, "Population, Employment, and Housing" (beginning on page 4.3-2), implementing the proposed LRDP would not induce growth above existing forecasts by ABAG for regional

[54] San Francisco Redevelopment Agency. 2008 (December 18). *Final Environmental Impact Report for the Visitacion Valley Redevelopment Program.* San Francisco, CA. Chapter 15, "Utilities and Service."

population growth; therefore, implementing the LRDP would not result in additional residential demand for wastewater treatment beyond what has already been included in forecasts of San Francisco's wastewater generation. Therefore, this analysis focuses on changes in wastewater generated at each of the five campuses.

As detailed in Table 4.12-3, the Pacific, Davies, and St. Luke's Campuses (and the California Campus) would experience a decrease in wastewater production under dry- weather conditions by 2030. In addition, the City's Stormwater Management Ordinance would reduce wet-weather conditions discharges from those areas within each campus where construction would disturb more than 5,000 sq. ft., leading to a net reduction in wet-weather discharge.

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

Stormwater discharges from the existing CPMC campuses would decrease relative to existing conditions, because compliance with the Stormwater Management Ordinance would reduce stormwater discharges from those areas within each campus where construction would disturb more than 5.000 sq. ft applicable to all CPMC Campuses. For those areas with an existing imperviousness greater than 50%, runoff volume would be reduced by 25% from the 2-year 24-hour design storm through the implementation of LID design measures or green building features. For those areas with existing imperviousness of 50% or less, the site must "implement a stormwater management plan that prevents the post-development peak discharge rate and quantity from exceeding the pre-development peak discharge rate and quantity for the 1- and 2- year 24-hour design storms." Both criteria would reduce the volume and associated impacts of runoff originating from the LRDP. City regulations require that LID design elements, such as cisterns, bioretention basins, or green roofs be implemented to enhance the opportunities for infiltration and reuse. Stormwater runoff rates would be calculated during preparation of the stormwater control plan and submitted for approval with 100% construction drawings. The Cathedral Hill, St. Luke's, and Davies Campuses would need to prepare a stormwater control plan. For more information on stormwater management at each campus, see Section 4.15, "Hydrology and Water Quality."

Wastewater production at the location of the proposed Cathedral Hill Campus is expected to increase by 25.8 million gallons per year (approximately 0.07 mgd) with the development of the proposed Cathedral Hill Hospital and Cathedral Hill MOB and renovation of the Pacific Plaza Office Building to become the 1375 Sutter MOB. CPMC has been actively engaged with the City to identify LID strategies to meet City stormwater regulations.[55] Specifically, cisterns and green roofs are being evaluated as potential design features for the proposed Cathedral

[55] CPMC has met with the SFPUC Wastewater Enterprise three times regarding the proposed LRDP. Meetings were held on December 15, 2008, June 11, 2009, and December 15, 2009. Stormwater management approaches discussed included green roofs, rainwater capture and reuse using cisterns, and infiltration BMPs.

Hill Campus. Final design elements, meeting both the City's stormwater regulations as well as LEED® Sustainable Sites Credit 6.1, would be incorporated into the project and would result in a net reduction in stormwater runoff from the site.

In 2030, total dry-weather wastewater production from all CPMC campus sites is expected to decrease by approximately 13% from 2006 figures (see Table 4.12-3, "Existing and Projected Total Annual Wastewater Volumes at Each CPMC Campus [not including stormwater]," page 4.12-31). This is a net decrease of 13.9 million gallons of wastewater generated annually. Additionally, the Stormwater Management Ordinance requirements will result in a net reduction in stormwater (wet-weather) flows from the campuses relative to existing conditions, reducing overall discharges to the combined sewer.

In summary, the proposed LRDP would not require or result in the construction of new wastewater treatment facilities or expansion of existing facilities. **This impact would be less than significant**.

Cathedral Hill and St. Luke's Campuses with Project Variants: Neither removing the pedestrian tunnel from near-term projects at the proposed Cathedral Hill Campus, nor changing the cedar or Post Street roadway directions under the project variants would not change wastewater generation at this campus relative to the projects as proposed because no new building would be constructed at the site of the proposed tunnel; as a result, this impact would be similar to the impact of near-term projects discussed above. Neither of the project variants for the St. Luke's Campus would change the type or intensity of land use for this campus, so wastewater generation at St. Luke's would not change. As a result, with implementation of any of the project variants, this impact would be similar to the impact of near-term projects discussed above. For the same reasons as described above**, this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, or St. Luke's Campuses in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

This long-term impact is similar to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. As detailed in Table 4.12-3, the Pacific and Davies Campuses would experience a decrease of 19 million gallons annually in wastewater production under dry-weather conditions by 2030. Long-term projects at both campuses would comply with the Stormwater Management Ordinance to reduce runoff volume by 25%. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific Campus or Davies Campus in the long term.

IMPACT UT-4 *The project would not require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. (Significance Criterion 12d)*

Levels of Significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variants): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

All existing and proposed CPMC campuses are located within an area that drains to the City's combined sewer system (which collects both wastewater and stormwater). As described above under Impact UT-3, the City's Stormwater Management Ordinance would reduce stormwater discharges from those areas within each campus where construction would disturb more than 5,000 sq. ft. For those areas with an existing imperviousness greater than 50%, runoff volume would be reduced by 25% from the 2-year 24-hour design storm through the implementation of LID design measures or green building features. For those areas with existing imperviousness of 50% or less, the site must "implement a stormwater management plan that prevents the postdevelopment peak discharge rate and quantity from exceeding the predevelopment peak discharge rate and quantity for the 1- and 2-year 24-hour design storms." Both criteria would reduce the volume and associated impacts of runoff originating from the LRDP. Stormwater runoff rates would be calculated during preparation of the stormwater control plan and submitted for approval with 100% construction drawings. The Cathedral Hill, St. Luke's, and Davies Campuses would need to prepare a stormwater control plan. City regulations encourage the use of LID design elements, such as cisterns, bioretention basins, permeable pavement, infiltration trenches, and/or green roofs to meet this requirement because they enhance opportunities for infiltration and reuse.[56] Therefore, with implementation of near-term projects under the LRDP, stormwater flows would decrease relative to existing

[56] City of San Francisco, San Francisco Public Utilities Commission, and Port of San Francisco. 2009 (November). *Draft San Francisco Stormwater Design Guidelines*. San Francisco, CA. Available: http://sfwater.org/mto_main.cfm/MC_ID/14/MSC_ID/361/MTO_ID/543. Accessed March 10, 2010.

conditions. For more information on stormwater management at each campus, see Section 4.15, "Hydrology and Water Quality."

In 2030, total dry-weather flows to the combined sewer from all CPMC campus sites are expected to decrease by approximately 13% from 2006 figures (see Table 4.12-3, "Existing and Projected Total Annual Wastewater Volumes at Each CPMC Campus [not including stormwater]," page 4.12-31). This is a net decrease of 13.9 million gallons of wastewater entering the system annually. This, in combination with the net reduction in wet-weather flows, demonstrates a reduction of inflow to the combined relative to existing conditions. **Therefore, this impact would be less than significant.**

Cathedral Hill and St. Luke's Campuses with Project Variants: Neither the Van Ness Avenue pedestrian tunnel proposed for construction at the Cathedral Hill Campus, nor either of the roadway variants would affect the amount or quality of stormwater discharged to the combined sewer during long-term operations because the tunnel would be entirely underground, and the directional use of roadways would not affect stormwater. In addition, the project would not result in the construction of new stormwater drainage facilities or expansion of existing facilities during the construction phase. Therefore, with the tunnel removed from near-term projects under the Cathedral Hill project variant or either of the roadway variants, this impact would be similar to the impact of near-term projects discussed above. Neither of the project variants for the St. Luke's Campus (utility line realignment or emergency room relocation) would change the amount of impervious surface proposed at this campus. Therefore, the impact that would result from implementing either of these project variants would be substantially the same as the impact that would result from the proposed near-term projects. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, and St. Luke's Campuses in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

This long-term impact is similar to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. Long-term projects at the Pacific Campus would replace certain existing buildings with a parking garage and an ACC Addition; at the Davies Campus, the Castro Street/14th Street MOB would replace an existing parking garage. Long-term projects at both campuses would comply with stormwater guidelines applicable at the time of construction. The impacts of those projects would be evaluated in greater detail before project-level approvals are granted, and more specific mitigation measures would be determined and implemented based on an analysis of the design features of such projects. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at the Pacific and Davies Campuses in the long term.

IMPACT UT-5

SFPUC would have sufficient water supplies to serve the project from existing entitlements and resources. No new or expanded entitlements would be needed. (Significance Criterion 12e)

Levels of Significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variants): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

Please see Impact UT-2 on page 4.12-26. SFPUC would supply the necessary water to the CPMC campus sites. In a letter dated September 15, 2009, SFPUC confirmed to the San Francisco Planning Department that SFPUC has included the water demands associated with the proposed LRDP in San Francisco's future water demands and that the LRDP would not result in major expansion of the water utility system.[57] In addition, CPMC intends to attain LEED® Silver certification for the proposed Cathedral Hill MOB and St. Luke's MOB/Expansion Building by incorporating LEED® Silver design standards into these buildings, in addition to all new buildings constructed as part of long-term projects. While the proposed Neuroscience Institute building at the Davies Campus is not subject to the Green Building Ordinance, CPMC intends to attain a LEED Certified rating for the proposed Cathedral Hill Hospital and the St. Luke's Replacement Hospital. CPMC may incorporate design features such as water-efficient landscaping and innovative wastewater technologies into the design, which would reduce overall water use.

SFPUC would not require any new or expanded entitlements to provide water to the CPMC campuses. **This impact would be less than significant.**

[57] San Francisco Public Utilities Commission. 2009e (September 15). Letter from SFPUC, Director of Water Resources, to San Francisco Planning Department regarding water supply assessment for proposed CPMC *Long Range Development Plan*. San Francisco, CA.

Cathedral Hill and St. Luke's Campuses with Project Variants: Neither removing the Van Ness Avenue pedestrian tunnel from near-term projects at the Cathedral Hill Campus nor either of the roadway variants would change water demand at this campus relative to the near-term projects as proposed because no new building would be constructed at the site of the proposed tunnel or as a result of the directional use of the roadways. As a result, this impact would be identical to the impact of near-term projects discussed above. Neither of the project variants for the St. Luke's Campus (utility line realignment or emergency room relocation) would change the proposed uses and corresponding water demand at the St. Luke's Campus, so water demand at this campus would not change relative to the near-term projects as proposed. Therefore, this impact would be identical to the impact of near-term projects discussed above. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, and St. Luke's Campuses in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

This long-term impact is similar to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific or Davies Campuses in the long term.

IMPACT UT-6

The project would be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs. (Significance Criterion 12f)

Levels of Significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

Construction

Solid waste would be generated at the CPMC campuses during demolition of existing structures on-site and the construction of new structures. The demolition of on-site structures and CPMC campus construction under the LRDP would result in a short-term increase in solid waste.

As discussed previously, compliance with the City's Construction and Demolition (C&D) ordinance (No. 27-06) would require that C&D debris transported off-site be delivered to a registered construction recycling facility, not a landfill. The ordinance also requires that C&D debris be taken to a registered facility that can process mixed C&D debris and divert a minimum of 65% of the material from the landfill, in keeping with the requirements established for the City by the state Integrated Waste Management Act. To maintain the City's goal of diverting 65% of solid waste and to offset impacts associated with solid waste, CPMC would be required to implement waste reduction, diversion, and recycling during demolition/construction at its medical campuses. Construction debris would be hauled away by either Sunset Scavenger Company or Golden Gate Debris Box Service and disposed for recycling at San Francisco Recycling and Disposal, Inc. Compliance with the Integrated Waste Management Act, the C&D ordinance, and other City-required regulations would reduce the amount of solid waste generated at the CPMC campus sites that would ultimately be disposed of at area landfills. The City also expanded its green building policies with Ordinance 180-08, which requires all new commercial projects exceeding 25,000 sq. ft. for Group B and M occupancies (except commercial interior projects) to divert at least 75% of construction debris. Because CPMC would comply with City recycling requirements and green building policies, as applicable, **this impact would be less than significant**.

Operation

This analysis included an evaluation of solid waste generated during operation of the CPMC campuses under the proposed LRDP. During operation, solid waste would be generated from the medical facilities and ancillary buildings. Table 4.12-4, "Existing Solid Waste/Recycling Demands at Each CPMC Campus (2006)," displays the existing levels of waste generated at the current (2006) CPMC campuses. (Existing generation of solid waste by the existing land uses at the site of the proposed Cathedral Hill Campus, though listed in Table 4.12-4, was not analyzed because it does not accurately forecast future waste generation by CPMC at Cathedral Hill.)
Table 4.12-5, "Projected Solid Waste/Recycling Demands at Each CPMC Campus (2020)," displays projected (2030) generation of solid waste for each campus, including Cathedral Hill.

Currently, CPMC generates 8,678,000 pounds of waste per year. Under the proposed LRDP, the CPMC campuses (including the California Campus) are anticipated to generate approximately 10,350,269 pounds per year in 2030. This would be a 24% increase from the solid waste currently generated at the existing four CPMC campuses. This

Table 4.12-4
Existing Solid Waste/Recycling Demands at Each CPMC Campus (2006)

Campus/Location	Daily Population	Solid Waste (pounds)	Solid Waste Recycling (pounds)
Cathedral Hill	0	325,584	0
Pacific	2,915	3,221,000	255,000
California	2,096	3,302,000	271,000
Davies	1,033	997,000	315,792
St. Luke's	802	832,000	393,000
Total	**6,044**	**8,678,000**	**1,234,000**

Source: BKF Engineers. 2010 (March 1). CPMC LRDP EIR Existing and Forecasted Demand for Community Services Questions: CS-1, CS-2, CS-5, CS-6. Pleasanton, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available as part of the project file, in Case No. 2005.0555E.

Table 4.12-5
Projected Solid Waste/Recycling Demands at Each CPMC Campus (2030)

Campus/Location	Daily Population	Solid Waste (pounds)	Solid Waste Recycling (pounds)
Cathedral Hill	3,585	4,373,983	646,667
Pacific	1,753	2,137,931	316,080
California	586	715,345	105,759
Davies	1,508	1,839,635	271,979
St. Luke's	1,052	1,283,375	189,739
Total	**7,432**	**10,350,269**	**1,530,224**

Source: BKF Engineers. 2010 (March 1). CPMC LRDP EIR Existing and Forecasted Demand for Community Services Questions: CS-1, CS-2, CS-5, CS-6. Pleasanton, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available as part of the project file, in Case No. 2005.0555E.

increase can be attributed to the development of the proposed Cathedral Hill Campus, which is anticipated to generate 4,373,983 pounds per year.

The City, however, has mandatory recycling and composting requirements in compliance with the Integrated Waste Management Act. In 2030, it is anticipated that about 20% of the solid waste generated at the CPMC campuses—a total of approximately 1,530,224 pounds per year—would be recycled. This is a 0.2% increase from the amount of waste currently recycled at the four existing campuses. However, this projection regarding future recycling at the CPMC campuses was developed by applying existing per capita recycling rates to anticipated future populations at the CPMC campuses, and conservatively does not account for increases in recycling rates that could be expected to occur due to implementation of adopted City goals and regulations, such as the City's goal to divert 75% of all waste from landfills by 2010 and 100% by 2020 and the San Francisco Mandatory Recycling and Composting Ordinance. To maintain the City's goal of diverting 75% of solid waste and to offset impacts associated with solid waste, CPMC would be required to implement waste reduction, diversion, and recycling during operation at its medical campuses. The City also expanded its green building policies with Ordinance 180-08, which requires all new commercial projects for Group B and M occupancies exceeding 25,000 sq. ft. (except commercial interior projects) to reduce use of potable water for landscaping by 50%, and reduce the use of potable water for plumbing fixtures by 20%. Group B building occupancy includes doctor's offices, and thus CPMC's MOBs would be required to comply with the building policies of Ordinance 180-08. Additionally, CPMC intends to attain LEED® Silver certification for the proposed Cathedral Hill MOB and St. Luke's MOB/Expansion Building by incorporating LEED® Silver design standards into these buildings, in addition to all new buildings constructed as part of long-term projects. CPMC also intends to attain a LEED Certified rating for the proposed Cathedral Hill Hospital and the St. Luke's Replacement Hospital. Among the strategies that may be used are construction waste management and innovative wastewater technologies and provision of storage and collection facilities for ongoing recycling and composting efforts by building users. These strategies were not used in the impact analysis but may be employed by CPMC, in addition to the mitigation measures discussed.

Nonrecyclable waste produced at the CPMC campuses is disposed of at the Altamont Landfill on Altamont Pass Road in Livermore. By 2030, implementing the proposed LRDP would increase the average daily throughput at the Altamont Landfill by approximately 7.5% (an additional 1.6 million pounds, or 836 tons, per year) of its maximum total permitted throughput of about 11,150 tons per day.[58] This landfill is projected to have sufficient capacity to operate until at least 2032. However, as the largest single contributor, the City has an agreement for the disposal of 15 million tons of solid waste, expected to accommodate its needs through 2014. The City is in the final stages of a selection process anticipated to be approved this year for an additional landfill or a new contract, which is expected to accommodate its waste disposal needs for 20 or more years, and the City has identified three landfills that have the capacity to meet the City's needs.[59] The increase in solid waste from implementation of the proposed LRDP could be accommodated by the Altamont Landfill's existing permitted capacities, or by the other landfills identified by the City as having sufficient capacity to meet the City's needs after reaching the capacity allowed under the existing agreement for disposal at the Altamont Landfill.

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[58] California Integrated Waste Management Board. 2007b. Facility/Site Summary Details; Altamont Landfill and Resource Recovery. Available: http://www.ciwmb.ca.gov/SWIS/01-AA-0009/Detail/. Accessed September 2009.

[59] San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Draft Environmental Impact Report*. Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Section III.Q, "Utilities."

Compliance with the Integrated Waste Management Act, the City's C&D ordinance (No. 27-06), the City's Mandatory Recycling and Composting Ordinance (No. 100-09), and other City-required regulations would reduce the amount of solid waste generated at the CPMC campuses that would ultimately be disposed of at area landfills. Because CPMC would implement campuswide recycling efforts and comply with City recycling requirements, and green building policies, as applicable, and because landfills with sufficient capacity to meet the City's future needs have been identified, **this impact would be less than significant**.

Cathedral Hill and St. Luke's Campuses with Project Variants: Neither removing the pedestrian tunnel from near-term projects at the Cathedral Hill Campus nor either roadway directional variant would increase solid waste generation at this campus because the overall population of the campus (e.g., doctors, staff, visitors) would not increase; as a result, this impact would be identical to the impact of near-term projects discussed above. Neither of the project variants for the St. Luke's Campus (the utility realignment and emergency room relocation) would change the land use at this campus, so solid waste generation at St. Luke's would not change relative to the near-term projects as proposed. As a result, this impact would be identical to the impact of near-term projects discussed above. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, and St. Luke's Campuses in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

All activities for the Pacific Campus under the LRDP are proposed in the long term. After the transferring of services (inpatient acute care and Emergency Department functions) from the Pacific Campus to the proposed Cathedral Hill Campus, interior renovation and conversion of the existing 2333 Buchanan Street Hospital into the ACC would occur. The long-term projects proposed for the Davies Campus include the demolition of the existing 290-space structured parking garage at 14th Street and Castro Street and the construction of the proposed 45-foot-tall, three-story 14th Street/Castro Street MOB. Solid waste would be generated by the interior renovation and conversion at the Pacific Campus and demolition and construction at the Davies Campus; however, similar to the discussion above for the near-term impacts of Cathedral Hill, Davies, and St. Luke's Campuses, the project would comply with the City's C&D Ordinance 180-8 and recycling and composting requirements during operations. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific and Davies Campuses in the long term.

IMPACT UT-7 *The project would comply with federal, state, and local statutes and regulations related to solid waste. (Significance Criterion 12g)*

Levels of Significance:

- *Cathedral Hill (with or without project variants): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variants): Less than significant*
- *CPMC LRDP Projects at Full Buildout (2030): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

As discussed above, CPMC, in implementing the proposed LRDP, would comply with federal, state, and local statutes and regulations related to solid waste including the California Integrated Waste Management Act, SB 1374, and the California Solid Waste Reuse and Recycling Access Act. Solid waste generated during construction and operation of the CPMC campuses would be disposed of at local landfills. Transportation and disposal of construction debris would comply with all applicable federal, state, and local regulations. In addition, CPMC would implement campuswide recycling efforts in compliance with City recycling and composting requirements. Accordingly, **this impact would be less than significant**.

Cathedral Hill and St. Luke's Campuses with Project Variants: None of the project variants proposed for the Cathedral Hill and St. Luke's Campuses would affect CPMC's compliance with federal, state, and local statutes and regulations related to solid waste. This impact would be identical to the impact of near-term projects discussed above. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, and St. Luke's Campuses in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

This long-term impact is similar to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. For the same reasons as described above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific and Davies Campuses in the long term.

CPMC LRDP Projects at Full Buildout (2006–2030)

The project would not exceed wastewater treatment requirements of the San Francisco Bay RWQCB. As discussed above, CPMC would comply with City requirements by preparing a storm water pollution prevention plan (SWPPP) for each campus and incorporating construction BMPs. The changes in the uses within the buildings on the existing and proposed CPMC campuses would not substantially change the quality of wastewater discharged. As a result, implementing the LRDP at full buildout would not result in an exceedance of the San Francisco Bay RWQCB's wastewater treatment requirements. As shown in Table 4.12-3 on page 4.12-31 total annual wastewater volumes at CPMC campuses would decrease from 105.4 million gallons to 91.5 million gallons at full buildout. Accordingly, full buildout of the LRDP would not result in impacts to wastewater treatment facilities.

At full buildout, the LRDP would not result in increased stormwater flows or require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. Overall, by 2030, dry weather flows from all near-term projects are expected to decrease by approximately 13%, and these would be a net reduction in wet weather flows. Long-term projects are expected to have similar characteristics.

At full buildout, the LRDP would not result in additional demand for water supply, result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

To evaluate potential impacts on water infrastructure at full buildout, current water use was compared to projected future water demands for all CPMC campuses system-wide. Overall, by 2030, annual water demand from all CPMC campuses system-wide is expected to show a net decrease of approximately 15.4 million gallons from 2006 figures as a result of the LRDP.

A study conducted by SFPUC, in collaboration with the Bay Area Water Supply and Conservation Agency, indicated that total water demand in SFPUC's entire service area was about 366 mgd in 2000–2001.

According to data received from the San Francisco Water Department, in 2006 total water demand for all five CPMC campuses (including the California Campus) was 117,070,000 gallons per year (i.e., approximately 0.32 mgd). At full buildout of LRDP, water demand for all five campuses combined would decrease to 101,700,000 gallons per year, which would be approximately 0.28 mgd. This would be within SFPUC's projections for water demand for the entire service area. In a letter dated September 15, 2009, SFPUC confirmed to the San Francisco Planning Department that SFPUC has included the water demand associated with full buildout of the proposed CPMC LRDP in San Francisco's future water demand and that full buildout of the LRDP would not result in a requirement for major expansion of the water utility system.[60]

As shown in Table 4.3-7, "CPMC Household and Population Growth Projections for San Francisco" (page 4.3-8), there would be a net increase of 3,478 residents (accounting for 3% of projected population growth for San Francisco between 2006 and 2030) at full buildout. However, due to compliance with city regulations, total wastewater volumes related to residential population growth resulting from implementation of the LRDP would decrease.

By 2030, implementing the proposed LRDP would increase the average daily throughput at the Altamont Landfill by approximately 75% (an additional 1.6 million pounds, or 836 tons per year) of its maximum total permitted throughput of about 11,150 tons per day (This assumes implementation of no waste reduction measures that potentially could occur as the result of Citywide implementation of the City's goals to achieve 75% landfill diversion by 2010 and 100% diversion by 2020, the San Francisco Food Service Waste Reduction Ordinance, and the San Francisco Mandatory Recycling Ordinance). The Altamont Landfill is projected to have sufficient capacity to operate until at least 2032, but the City's contract would need to be extended or a new contract executed at Altamont or with another vendor, because the City's remaining capacity under its current contact may be reached as early as August 2014, as discussed on page 4.12-14.

The increase in solid waste from implementation of the proposed LRDP could be accommodated by the Altamont Landfill's existing capacity or by another landfill with sufficient capacity to accommodate the City's solid waste disposal needs. At full buildout, the impact of the LRDP on San Francisco's solid waste disposal capacity would be less than significant.

[60] San Francisco Public Utilities Commission. 2009e (September 15). Letter to San Francisco Planning Department regarding water supply assessment for proposed CPMC *Long Range Development Plan*. From Paula Kehoe, Director of Water Resources, San Francisco Public Utilities Commission. San Francisco, CA.

4.12.5 CUMULATIVE IMPACTS

The potential contribution of the proposed CPMC LRDP to cumulative impacts on utilities was evaluated in the context of reasonably foreseeable future development expected to occur within the respective service areas for water, wastewater and stormwater, and solid waste.

WATER

SFPUC's regional water system provides water to 2.4 million people, as well as to retail and wholesale customers in San Francisco, San Mateo, Santa Clara, Alameda, and Tuolumne Counties. As part of its planning for future water supply needs, SFPUC has conducted comprehensive planning studies to assess water demands to 2030. SFPUC has adequate supplies to meet the demand for water within its service area through 2030, and is in the process of identifying future supplies and establishing conservation programs to meet demand in the event of a 3-year drought. SFPUC has included the proposed LRDP's projected demand for water in its water supply planning. Furthermore, the proposed LRDP would result in a decrease in demand for water across all CPMC campuses in the long term, because of changes at the existing four campuses and the incorporation of LEED® design standards. As a result of SFPUC's planning efforts, **the cumulative impact of development projects including LRDP within San Francisco on water supplies would be less than significant**.

WASTEWATER AND STORMWATER

The five CPMC campuses included in the proposed LRDP would use various components of San Francisco's combined wastewater and stormwater collection, treatment, and disposal system, operated by SFPUC. SFPUC's *San Francisco Sewer System Master Plan* is under development and is expected to address the need for additional sewer system capacity for planned future development through capital improvements. Individual projects will likely be required to provide on-site treatment and reduce peak runoff from storm events. The City's Stormwater Management Ordinance was enacted to improve the environment by reducing stormwater runoff and runoff pollution in areas of new development and redevelopment through compliance with the Stormwater Design Guidelines. The Stormwater Design Guidelines detail the planning, sizing, approaches, and regulatory framework for developing new infrastructure in a manner that retains, reuses, or treats stormwater runoff. As a result of these planning efforts and policies, **the cumulative impact of development projects including LRDP on the capacity of existing and planned storm sewers would be less than significant**.

SOLID WASTE

This analysis of cumulative impacts related to solid waste considers the proposed LRDP in the context of the Altamont Landfill's capacity. The Altamont Landfill is expected to have the capacity to operate until at least 2032. However, as the largest single contributor, the City has an agreement for the disposal of 15 million tons of solid waste, expected to accommodate its needs through 2014. The City is in the final stages of a selection process anticipated to be approved this year for an additional landfill, or a new contract, which is expected to accommodate its waste disposal needs for 20 or more years, and the City has identified three landfills that have the capacity to meet the City's needs.[61] Given these planning efforts, **the cumulative impact of future development including LRDP on San Francisco's solid waste disposal capacity would be less than significant**.

[61] San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Draft Environmental Impact Report*. Redevelopment Agency File No. ER06.05.07. Planning Department File No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Section III.Q, "Utilities."

4.13 BIOLOGICAL RESOURCES

This section of the EIR discusses existing biological resources within and surrounding the sites of the proposed and existing CPMC campuses and examines the potential for the near-term and long-term projects proposed for each campus to (1) result in substantial and adverse direct, indirect, or cumulative impacts on biological resources (including plants, wildlife, aquatic species, and vegetation communities); (2) interfere substantially with the movement of native fish or wildlife species; (3) conflict with local policies or ordinances protecting biological resources; or (4) conflict with the provision of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan. This section analyzes both project-level and cumulative environmental impacts, as well as feasible mitigation measures that could reduce or avoid any identified significant impacts.

4.13.1 ENVIRONMENTAL SETTING

ALL CAMPUSES

The sites of the proposed and existing CPMC campuses are all located in San Francisco, which has a Mediterranean climate with moderately warm, dry, but foggy summers and mild, wet winters. All five campus sites are located within long-developed dense urban areas, with no native vegetation communities, natural drainages, or wetlands on the sites. Existing vegetation landscapes vary by campus, but all are composed of typical ornamental urban landscape species.

Special-Status Species

This section addresses the potential for special-status species to occur in the region. “Special-status species” are defined as plants and animals that are legally protected under the federal Endangered Species Act of 1973 (ESA) (16 U.S. Code [USC] 1531 et seq.), the California Endangered Species Act (CESA) (California Fish and Game Code, Section 2050 et seq.), or other regulations, and species that are considered sufficiently rare by the scientific community to qualify for such listing. The California Department of Fish and Game’s (DFG’s) California Natural Diversity Database (CNDDB) includes records of 34 special-status flora and fauna species that occur within 2 miles of a CPMC campus site. However, most of these occurrences are historic, with the species believed to have been extirpated by the disturbance or destruction of suitable habitat, or to occur in remnant native vegetation. Based on a literature and database review conducted by an AECOM biologist[1] and on the biologist’s familiarity

[1] Avent, S. 2009 (October 14). *Biological Resources Field Survey Letter Report for the Five Campus Sites of the California Pacific Medical Center (CPMC).* San Francisco, CA. Letter memorandum to Jayni Allsep, Project Manager, AECOM, San Francisco, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

with the flora within the region, special-status plant species[2] are not considered to have the potential to occur on any of the CPMC campus sites. Field visits to the sites of the proposed and existing campuses on September 29, 2009, found no areas that exhibited substantial diversity of herbaceous native plants, or that were considered to have the potential to support special-status plant species. Intense landscaping activities were evident at all sites, also reducing the likelihood that rare plant species are present.

With the exception of bird and bat habitat, habitat for sensitive species listed in the CNDDB as having historically occurred within 1 mile of each proposed or existing CPMC campuses was absent, and specifically from the campus locations proposed for near-term and long-term development under the LRDP. Wildlife species that were historically located within 1 mile of the five campus sites include American badger (*Taxidea taxus*), a California species of special concern; California red-legged frog (*Rana draytonii*), which is federally listed as threatened and a California species of special concern; mission blue butterfly (*Plebejus icarioides missionensis*), which is federally listed as endangered; and San Francisco forktail damselfly (*Ischnura gemina*), tracked by the CNDDB (Figure 4.13-1, "Special-Status Species Occurrences within 1 Mile of the CPMC Campuses," page 4.13-3). The American badger requires sufficient food, friable soils, and open, uncultivated ground. The California red-legged frog and San Francisco forktail damselfly require on-site or nearby wetland or aquatic features. The mission blue butterfly requires grasslands and one of three larval host plants (*Lupinus albifrons*, *L. variicolor*, or *L. formosus*). The habitats and requirements for these species were absent at all CPMC campuses; therefore, none of these wildlife species are expected to occur. Because the campuses are located within developed urban areas, on-site or nearby wildlife species are anticipated to include those species adapted to urban conditions (e.g., mice, raccoons, opossums, skunks), which are not considered rare or endangered, or protected under federal or state laws.

Although there was no evidence of roosting bats at the time of the surveys, habitat exists in mature trees and in recesses of existing buildings, and bats do have the potential to occur at all five campus sites. One occurrence of hoary bat (*Lasiurus cinereus*), a species tracked by the CNDDB, was noted 1.6 miles southwest of the California Campus in Golden Gate Park (Figure 4.13-1, page 4.13-3).[3] This species uses medium to large trees with dense foliage to roost. This species may occur at all sites except the site of the proposed Cathedral Hill Campus, which lacks trees with dense foliage.

Table 4.13-1, "Occurrences of Special-Status Plants within 1.5 Miles of a CPMC Campus Site" (page 4.13-4), identifies listed species and species of concern with CNDDB records occurring in the region.

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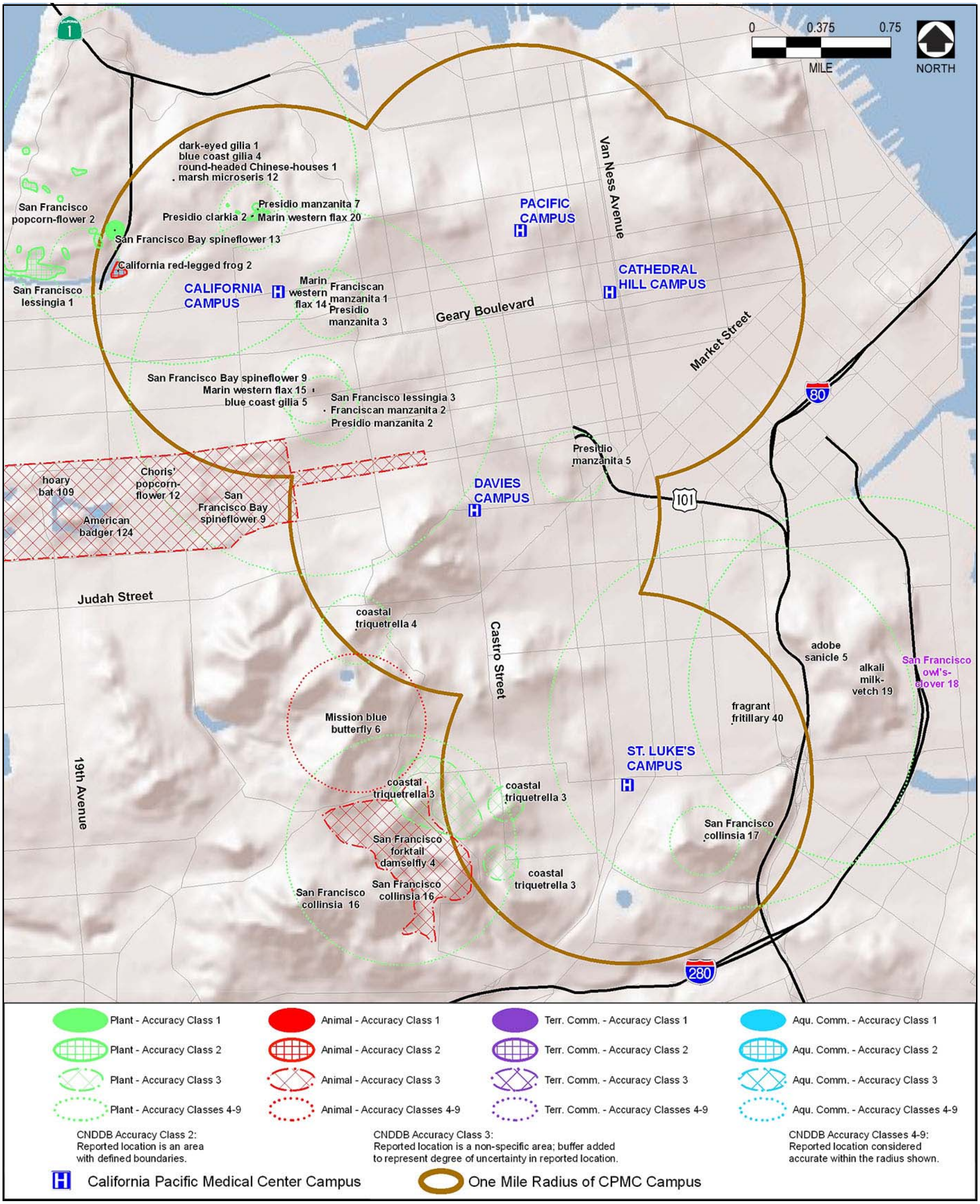
[2] For purposes of this EIR, "special-status plant species" is defined as a species protected by the federal ESA, the CESA, or the Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.); or identified by a federal, state, or local agency as a candidate for listing, fully protected species, sensitive species, or species of special status.

[3] California Natural Diversity Database. 2006 (July). Electronic records search for the San Francisco North and San Francisco South 7½-minute quadrangles. California Department of Fish and Game, Wildlife and Habitat Data Analysis Branch. Sacramento, CA.



Sources: U.S. Fish and Wildlife Service, California Department of Fish and Game, ESRI; data compiled by AECOM in 2009

Special-Status Species Occurrences within 1 Mile of the CPMC Campuses **Figure 4.13-1**

Table 4.13-1
Occurrences of Special-Status Plants within 1.5 Miles of a CPMC Campus Site

Common Name	Scientific Name	CNDDB Occurrence #	Presence	Year of Observation	Distance from Nearest Campus
Adobe sanicle	*Sanicula maritima*	5	Possibly extirpated	1895	1.5 miles northeast of St. Luke's Campus
Alkali milk-vetch	*Astragalus tener* var. *tener*	19	Possibly extirpated	1868	1.5 miles northeast of St. Luke's Campus
Blue coast gilia	*Gilia capitata* ssp. *chamissonis*	5	Extirpated	1912	0.5 mile south of California Campus
		4	Presumed extant	Unknown	0.9 mile northwest of California Campus
Choris' popcorn-flower	*Plagiobothrys chorisianus* var. *chorisianus*	12	Presumed extant	Unknown	1.25 miles southwest of California Campus
Coastal triquetrella	*Triquetrella californica*	3	Presumed extant	2000	0.5 mile west of St. Luke's Campus
		4	Presumed extant	Unknown	1.0 mile southwest of Davies Campus
Dark-eyed gilia	*Gilia millefoliata*	1	Possibly extirpated	1912	0.9 mile northwest of California Campus
Fragrant fritillary	*Fritillaria liliacea*	40	Possibly extirpated	1896	0.7 mile northeast of St. Luke's Campus
Franciscan manzanita	*Arctostaphylos hookeri* ssp. *franciscana*	2	Extirpated	1940	0.7 mile south of California Campus
		1	Extirpated	1946	0.25 mile east of California Campus
Marin western flax	*Hesperolinon congestum*	15	Extirpated	1887	0.5 mile south of California Campus
		14	Extirpated	1912	0.25 mile east of California Campus
		20	Possibly extirpated	1985	0.4 mile north of California Campus
Marsh microseris	*Microseris paludosa*	12	Extirpated	1956	0.9 mile northwest of California Campus
Presidio clarkia	*Clarkia franciscana*	2	Presumed extant	2005	0.4 mile north of California Campus
Presidio manzanita	*Arctostaphylos hookeri* ssp. *ravenii*	5	Extirpated	Late 1800s	0.6 mile northwest of Davies Campus
		2	Extirpated	1928	0.7 mile south of California Campus
		3	Extirpated	1938	0.25 mile east of California Campus
		7	Possibly extirpated	1997	0.4 mile north of California Campus

Table 4.13-1
Occurrences of Special-Status Plants within 1.5 Miles of a CPMC Campus Site

Common Name	Scientific Name	CNDDB Occurrence #	Presence	Year of Observation	Distance from Nearest Campus
Round-headed Chinese-houses	*Collinsia corymbosa*	1	Presumed extant	1902	0.9 mile northwest of California Campus
San Francisco Bay spineflower	*Chorizanthe cuspidata* var. *cuspidata*	9	Possibly extirpated	1912	1.25 miles west of Davies Campus
		13	Presumed extant	1992	1.0 mile northwest of California Campus
San Francisco collinsia	*Collinsia multicolor*	17	Presumed extant	1925	0.5 mile southeast of St. Luke's Campus
		16	Presumed extant	1929	1.0 mile southwest of St. Luke's Campus
San Francisco lessingia	*Lessingia germanorum*	3	Extirpated	1927	0.7 mile south of California Campus
		1	Presumed extant	2008	1.25 miles west of California Campus
San Francisco popcorn-flower	*Plagiobothrys diffusus*	2	Presumed extant	1933	0.75 mile west of California Campus

Notes: CNDDB = California Natural Diversity Database
Source: Data compiled by AECOM in 2009

Protected Birds

Migratory birds and their active nests, eggs, and young are protected by the federal Migratory Bird Treaty Act, and other nesting birds are protected by the California Fish and Game Code (see Section 4.13.2, "Regulatory Framework," page 4.13-10). The movements of migratory birds in San Francisco are generally poorly known, but flyways are assumed to exist along the primary ridgeline from San Bruno Mountain State Park to the Presidio and along the shorelines (primarily the ocean shoreline). Although bird flyways are not traditionally considered wildlife movement corridors, San Francisco's shoreline serves as important habitat for bird species during migration through the Pacific Flyway. However, none of the campus sites, with the possible exception of the California Campus, are near those bird flyways. Migratory birds would most likely fly along the shoreline rather than through the city. No construction or tree removal is planned for the California Campus, the only campus potentially near the flyway for migratory birds.

Habitat for nesting birds, however, is present on-site at all campuses. Given the numerous mature shrubs and trees on-site and the presence of multistory buildings, the potential for nesting birds to be present is high, as evidenced by the multiple bird species and inactive nests seen throughout the five sites during the site survey. Bird species observed during biological field surveys were rock dove (*Columba livia*), American crow (*Corvus* *brachyrhynchos*), American robin (*Turdus migratorius*), white-crowned sparrow (*Zonotrichia leucophrys*), Anna's hummingbird (*Calypte anna*), and house sparrow (*Passer domesticus*). Many species of ground-nesting birds may use the secluded ornamental grounds and vegetation on the sites as well.

CATHEDRAL HILL CAMPUS

The proposed Cathedral Hill Campus would encompass 3.85 acres of developed land within the Cathedral Hill neighborhood, a densely urbanized area. The site of the proposed Cathedral Hill Hospital is bounded by Post Street to the north, Van Ness Avenue to the east, Geary Boulevard to the south, and Franklin Street to the west. The site of the proposed Cathedral Hill Medical Office Building (MOB) is approximately 1.2 acres and is located across Van Ness Avenue, north of Geary Boulevard and south of Cedar Street.

The sites of the proposed Cathedral Hill Hospital and Cathedral Hill MOB currently consist of nine buildings, including an office tower, hotel, parking structure, residential apartments, and commercial buildings. The hotel includes on-structure roof gardens with landscaping and a water feature, and paved drop-offs. Both proposed sites include the surrounding sidewalks, street trees, and street furnishings.

As stated in an arborist survey,[4] 81 trees exist on the two sites, 77 on the hospital site and four on the MOB site[5] (see Table 4.13-2, "Summary of Trees at the Cathedral Hill Campus Project Site"). The proposed Cathedral Hill Campus would also include 1375 Sutter Street (currently the Pacific Plaza Office Building), which encompasses 0.72 acre and is bounded by Sutter Street to the north, Franklin Street to the west, and Daniel Burnham Court to the south. The building occupies approximately half the city block. The east portion of the lot abuts another building in the middle of the block. This lot was not surveyed by the arborist because the trees at this location would not be affected by the proposed interior renovation of the building at 1375 Sutter Street. However, based on a site review, approximately 22 street trees are present on the sidewalks adjacent to the Pacific Plaza Office Building (Table 4.13-2, page 4.13-7).

Of the 77 trees on the site of the proposed Cathedral Hill Hospital, 53 are street trees;[6] seven of these street trees are considered significant based on the criteria of the City and County of San Francisco (City) (see "City and County of San Francisco Urban Forestry Ordinance" in Section 4.13.2, "Regulatory Framework"), and 28 are trees associated with the existing hotel's upper-floor outdoor swimming pool and pavilion and were not

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4 California Pacific Medical Center. 2009 (August). *Cathedral Hill Campus and MOB Tree Inventory.* San Francisco, CA. Prepared by AECOM, Oakland, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

5 Seven street trees are at the Cathedral Hill MOB site, four on Van Ness Avenue and three on Geary Street. The trees on Geary Street are along Lots 6 and 7, which were added to the Cathedral Hill Campus projects later, so they are not reflected in the arborist report. However, the total of 84 rather than 81 trees at the Cathedral Hill Campus is accounted for in Table 4.13-2.

6 The arborist identified 13 trees (10 near the sidewalk and three near building entrance) as street trees. Seven of the trees near the sidewalk are significant.

Table 4.13-2
Summary of Trees at the Cathedral Hill Campus Project Site

Tree Location	Total No. of Trees	No. of Street Trees	No. of Significant Trees	No. of Trees Proposed to Be Removed/No. of Significant Trees to Be Removed
Cathedral Hill Hospital site	77	53	7	77/7
Cathedral Hill MOB site	7[a]		0	7/0
1375 Sutter MOB site	22	22	Not surveyed	0
Total trees	**106**		**7**	**84/7**

Note: MOB = Medical Office Building
[a] Of the seven street trees at the Cathedral Hill MOB site, four are on Van Ness Avenue and three on Geary Street. Those on Geary Street are along lots 6 and 7, which were added to the Cathedral Hill Campus projects later, so they are not reflected in the arborist report.
Source: Data compiled by AECOM in 2009

considered significant. Significant trees are defined by City ordinance as trees in, or within 10 feet of, a public right-of-way that are greater than 20 feet tall, have a canopy greater than 15 feet in diameter, or have a trunk greater than 12 inches in diameter at 4.5 feet above grade (i.e., diameter at breast height [dbh]) (see the "City/Local" discussion in Section 4.13.2, "Regulatory Framework," page 4.13-13). Street trees are trees within the public right-of-way or on land within the jurisdiction of the San Francisco Department of Public Works (DPW). All seven trees on the Cathedral Hill MOB site are street trees (four along Van Ness Avenue and three along Geary Street). The types of tree species located at both sites are London plane, Chinese juniper, pittosporum, and olive trees.

PACIFIC CAMPUS

The Pacific Campus is located in the Pacific Heights neighborhood, which is densely urbanized and primarily residential, and consists of multiple buildings on three adjacent blocks. The Pacific Campus is bounded by Clay Street to the north, Webster Street to the east, Sacramento Street to the south, and Fillmore Street to the west. The other two blocks of the campus are bounded by Buchanan Street to the east, Sacramento Street to the south, and Webster Street to the west. The site is bordered to the north by the residences on Washington Street between Webster Street and Buchanan Street. Based on a 2004 survey conducted for CPMC by BKF Engineers,[7] the campus is landscaped with 177 trees and large shrubs (see Table 4.13-3, "Summary of Trees at the Pacific Campus," page 4.13-8). None of these trees were considered significant. Some of the species of trees located at the Pacific Campus include buckeye, incense cedar, pittosporum, California sycamore, and New Zealand Christmas tree.

[7] California Pacific Medical Center. 2004. CPMC Pacific Campus Tree Survey on a Topographic Survey Map. 1"=40' Scale. San Francisco, CA. Prepared by BKF Engineers, Pleasanton, CA. This map is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

Table 4.13-3 Summary of Trees at the Pacific Campus				
Tree Location	Total No. of Trees	No. of Street Trees	No. of Significant Trees	No. of Trees Proposed to Be Removed/ No. of Significant Trees to Be Removed
Pacific Campus	177	Not identified	0	86/0
Total trees				**86**
Source: Data compiled by AECOM in 2009				

CALIFORNIA CAMPUS

The California Campus is in Presidio Heights, a highly developed urban residential neighborhood. The California Campus is bordered by Sacramento Street to the north, Maple Street to the east, California Street to the south, and Cherry Street to the west. This campus also includes the four buildings and associated parking lots on the adjacent block to the west: 3838 California Street, 3808 California Street, 404 Cherry Street, and 3912 Sacramento Street. Based on a 2004 survey conducted for CPMC by BKF Engineers,[8] about 248 trees and large shrubs exist on the campus site (see Table 4.13-4, "Summary of Trees at the California Campus," below). The species of trees located at this campus include juniper, Brisbane box, London plane tree, and privet. No trees are proposed to be removed at the California Campus.

Table 4.13-4 Summary of Trees at the California Campus				
Tree Location	Total No. of Trees	No. of Street Trees	No. of Significant Trees	No. of Trees Proposed to Be Removed/No. of Significant Trees to Be Removed
California Campus	248	Not identified	0	0/0
Total trees				**0**
Source: Data compiled by AECOM in 2009				

DAVIES CAMPUS

The Davies Campus encompasses 7.2 acres in the highly developed Castro/Upper Market neighborhood of San Francisco. The campus is bounded by Duboce Avenue to the north, Noe Street to the east, 14th Street to the south, and Castro Street to the west. The site is primarily hardscape and buildings, but there are borders of ornamental trees and shrub landscaping. According to a tree survey and report prepared for CPMC by Hortscience in 2006,[9] there were 287 trees representing 32 species on the Davies Campus, generally mature in size (see Table 4.13-5, "Summary of Trees at the Davies Campus," page 4.13-9). The species of trees located on this campus include

8 Ibid.

9 California Pacific Medical Center. 2006. *Final Tree Report, California Pacific Medical Center—Davies Campus.* San Francisco, CA. Prepared by Hortscience Inc., San Francisco, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

Table 4.13-5
Summary of Trees at the Davies Campus

Tree Location	Total No. of Trees	No. of Street Trees	No. of Significant Trees	No. of Trees Proposed to Be Removed/No. of Significant Trees to Be Removed
Davies Campus	287	42	81	111/26
Total trees				**111**
Source: Data compiled by AECOM in 2009				

Monterey pine, New Zealand Christmas tree, Victorian box, and coast redwood. The tree report further identifies the trees according to suitability for preservation (based on factors such as health, age, structure, or disturbance tolerance), as good (116 trees), moderate (82 trees), or poor (89 trees). Based on the report's recommendations, 25–50 of the trees on the Davies Campus are in poor health and proposed for removal.[10, 11] No trees appeared to be indigenous to the site. Approximately 81 trees on this campus (mostly Monterey pines, coast redwoods, and Monterey cypresses) are considered significant trees and 42 trees (all Brisbane box) are street trees.

ST. LUKE'S CAMPUS

The St. Luke's Campus consists of eight buildings on a single block and a surface parking lot consisting of a portion of a second block, encompassing approximately 4.4 acres of developed land in the Mission District of San Francisco. The portion of the St. Luke's Campus that is developed with existing buildings is bounded by Cesar Chavez Street to the north, Valencia Street to the east, Duncan Street to the south, and San Jose Avenue to the west. The surface parking lot is located in the eastern portion of the block that is bounded by Cesar Chavez Street to the north, San Jose Avenue to the east, 27th Street to the south, and Guerrero Street to the west. The site is primarily hardscape and buildings, with border landscapes of trees and some shrubs, including a grove in front of the 1912 Building. According to an arborist survey performed by AECOM,[12] there are a total of 112 trees on the St. Luke's Campus (see Table 4.13-6, "Summary of Trees at the St. Luke's Campus," page 4.13-10). The species of trees on the St. Luke's Campus include pittosporum, blackwood acacia, Peruvian pepper tree, red ironbark, and Monterey pine. Of these trees, 37 meet the City's criteria for significant trees and include the following species of trees: pittosporum, blackwood acacia, red flowering gum, and Monterey pine. Notably, there is also a City-designated landmark tree on campus, a Moreton Bay fig (*Ficus macrophylla*), in front of the 1957 Building along

[10] California Pacific Medical Center. 2006. *Final Tree Report, California Pacific Medical Center—Davies Campus.* San Francisco, CA. Prepared by Hortscience Inc., San Francisco, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

[11] California Pacific Medical Center. 2008. *Cal Pacific Davies Tree Survey 2008.* San Francisco, CA. Prepared by Frank and Grossman, San Francisco, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

[12] California Pacific Medical Center. 2009 (August). *St. Luke's Campus Tree Inventory*. San Francisco, CA. Prepared by AECOM, Oakland, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

Table 4.13-6
Summary of Trees at the St. Luke's Campus

Tree Location	Total No. of Trees	No. of Street Trees	No. of Significant Trees	No. of Trees Proposed to Be Removed/No. of Significant Trees to Be Removed
St. Luke's Campus	112	9	37	28/14
Total trees proposed to be removed				**28**
Source: Data compiled by AECOM in 2009				

Valencia Street (see the discussion of landmark trees on page 4.13-14). The majority of the trees on the St. Luke's Campus are along the east side of the campus on Valencia Street south of the 1957 Building, and along Duncan Street along the campus's south side.

4.13.2 Regulatory Framework

This section describes federal, state, and local regulations, permits, and policies pertaining to biological resources as they apply to the proposed CPMC LRDP.

Federal

Federal Endangered Species Act

Under the ESA, which was enacted in 1973, the U.S. Secretary of the Interior and Secretary of Commerce have the authority to list a species as threatened or endangered (16 USC 1533[c]). The ESA is administered by both the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS). NMFS 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. USFWS is accountable for all other federally listed plants and animals. The USFWS regional office in Sacramento maintains a list of species of concern that receive special attention from other federal agencies (e.g., NMFS) during environmental review, although they are not protected under the ESA. Section 9 of the ESA prohibits any person or federal agency from "taking" endangered or threatened wildlife. The definition of take includes harassing, harming, hunting, shooting, wounding, killing, trapping, capturing, or collecting, or attempting to engage in any such conduct. Projects that would result in take of any species that is federally listed as threatened or endangered must obtain authorization for incidental take from NMFS or USFWS through either the Section 7 (interagency consultation) process or Section 10(a) (incidental take permit) process of the ESA. None of the existing or proposed campuses are located within an area under NMFS or USFWS jurisdiction, and no endangered or threatened wildlife exists on these campuses.

Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) (16 USC 703, Supp. I, 1989) prohibits killing, possessing, or trading in any native bird that may occur within a project area, except in accordance with regulations prescribed by the Secretary of the Interior. This act implements the treaties that the United States has signed with several countries for the conservation and management of bird species that migrate through more than one country, and is enforced in the United States by USFWS. The act protects the majority of migratory bird species (more than 800 species in the United States) and their active nests, eggs, and young.

STATE

California Endangered Species Act

California adopted the CESA in 1984. The state act prohibits the take of endangered and threatened species; however, habitat destruction is not included in the state's definition of take. Section 2090 of the CESA requires state agencies to comply with regulations for protection and recovery of endangered species and to promote conservation of these species. DFG administers the act and authorizes take through Section 2081 agreements (except for designated "fully protected species").

Under the CESA, the California Fish and Game Commission has the responsibility for maintaining a list of threatened and endangered species. Pursuant to the requirements of CESA, an agency reviewing a project within its jurisdiction must determine whether any state-listed endangered or threatened species may be present in the study area and determine whether the project would have an adverse affect on such species. In addition, DFG encourages informal consultation on any project that may affect a candidate species.

Section 2080 of the California Fish and Game Code prohibits take of any species that the California Fish and Game Commission determines to be an endangered or threatened species. "Take" is defined in Section 86 of the California Fish and Game Code as to hunt, pursue, catch, capture, or kill, or to attempt to hunt, pursue, catch, capture, or kill. Sections 2081(b) and 2081(c) of the California Fish and Game Code allow DFG to issue an incidental take permit for a state-listed threatened or endangered species only if specific criteria are met, such as take incidental to an otherwise lawful activity. CESA emphasizes early consultation to avoid potential impacts on rare, endangered, and threatened species and to develop appropriate mitigation planning to offset project-caused losses of listed species populations and their essential habitats.

Regarding rare plant species, the CESA defers to the California Native Plant Protection Act of 1977, which prohibits importing into California, taking, and selling rare and endangered plants. State-listed plants are protected mainly in cases where state agencies are involved in projects subject to CEQA analysis. In this case, plants listed as rare under the California Native Plant Protection Act are not protected under the CESA but can be protected under CEQA.

California Fish and Game Code

Section 3503 of the California Fish and Game Code states that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by the code. Birds of prey are further protected under Section 3503.5, which states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes (hawks) or Strigiformes (owls/birds of prey) or to take, possess, or destroy the nest or eggs of such birds, except as otherwise provided by the California Fish and Game Code or regulations adopted pursuant to the code. Construction disturbance during the breeding season could result in the incidental loss of eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered take by DFG. Similarly, Section 4150 of the California Fish and Game Code describes protections for nongame mammals.

"California Species of Special Concern" is a designation used by DFG for some declining wildlife species that are not state candidates for listing as threatened or endangered. This designation does not provide legal protection but signifies that these species are recognized as having special status by DFG. Under the State CEQA Guidelines (Section 15380), potential impacts on these species must be assessed.

California law relating to "fully protected" species (i.e., Section 3511 of the California Fish and Game Code) was among the nation's first attempts to provide additional protection to animals that were rare or faced possible extinction, predating even the federal ESA. Most fully protected species have also been given additional protection under more recent laws and regulations, and many have been listed under the ESA and CESA. Fully protected species (such as the peregrine falcon and white-tailed kite) may not be taken or possessed at any time, and no licenses or permits may be issued for their take except to collect these species for necessary scientific research and relocate the bird species for the protection of livestock. Four sections of the California Fish and Game Code—Sections 3511, 4700, 5050, and 5515—list 37 fully protected species. Each of these statutes:

- prohibits take or possession at any time of the species listed in the statute, with few exceptions;
- states that no provision of the code or any other law shall be construed to authorize the issuance of permits or licenses to take the species; and
- states that no previously issued permits or licenses for take of the species shall have any force or effect for authorizing take or possession.

Section 1602 of the California Fish and Game Code requires a streambed alteration agreement for any activity that may alter the bed and/or bank of a lake, stream, river, or channel. Typical activities that require a streambed alteration agreement include excavating or placing fill within a channel, clearing vegetation, putting structures in place to divert water, installing culverts and bridge supports, building cofferdams for construction dewatering, and reinforcing banks. A streambed alteration agreement would be required as part of the permitting process for the CPMC LRDP.

State CEQA Guidelines

Although threatened and endangered species are protected by specific federal and state statutes, Section 15380(b) of the State CEQA Guidelines provides that a species not listed on the federal or state list of protected species may be considered rare or endangered if the species can be shown to meet certain specified criteria. This section was included in the State CEQA Guidelines primarily to deal with situations in which a public agency is reviewing a project that may have a significant impact on, for example, a “candidate species” that has not yet been listed by either USFWS or DFG. Thus, CEQA provides an agency with the ability to protect a species from a project’s potential impacts until the respective government agencies have an opportunity to designate the species as protected, if warranted.

City/Local

San Francisco General Plan

The Environmental Protection Element of the *San Francisco General Plan* contains goals and policies related to biological resources protection. The proposed LRDP’s consistency to the “Environmental Protection Element” is discussed on page 3-4 of Chapter 3, “Plans and Policies.”

City and County of San Francisco Urban Forestry Ordinance

Sections 806–810 of Article 16, “Urban Forestry Ordinance” (Ordinance 165-95, approved May 19, 1995), of the San Francisco Public Works Code (Public Works Code) outlines DPW’s jurisdiction over trees and landscaping. DPW has jurisdiction over planning, planting, protection, maintenance, and removal of trees or landscaping in the public right-of-way, as well as over certain trees on private property if they are deemed hazard, landmark, or significant trees. For projects involving the removal of trees under DPW jurisdiction, the appropriate removal permit must be obtained concurrent with applications for building, demolition, or grading permits. Work must be completed within 6 months of an approved permit, unless an extension has been approved.[13] If DPW grants the tree removal permit, another tree must be planted in the place of the removed tree, or an in-lieu fee must be paid, unless DPW makes a written waiver. DPW also requires that notice be given to all interested San Francisco

[13] San Francisco Public Works Code, Article 16, “Urban Forestry Ordinance.” Available: http://www.municode.com/Resources/gateway.asp?pid=14142&sid=5. Section 806.

organizations and, to the extent practicable, the owners or property occupants on the block of the affected tree 30 days before removal; in addition, a notice must be posted on the affected tree. Written objections can be filed within those 30 days. If objections are filed, a hearing must be held before the tree can be removed.

Street Trees

Street trees are defined by City ordinance as trees in, or within 10 feet of, a public right-of-way or on land within DPW jurisdiction.

Significant Trees

Significant trees are defined by City ordinance as trees in, or within 10 feet of, a public right-of-way that are greater than 20 feet tall, have a canopy greater than 15 feet in diameter, or have a trunk greater than 12 inches in diameter at 4.5 feet above grade (i.e., greater than 12 inches dbh).[14] Removal of significant trees requires the authorization of the DPW director or the director's designee, and is subject to the rules and procedures governing permits and disclosures as above. As discussed below in Section 4.13.5, "Impact Evaluations," significant trees exist on the CPMC campus sites.

Landmark Trees

In 2007, the San Francisco Board of Supervisors adopted legislation for designation and protection of landmark trees. Landmark trees can be anywhere within San Francisco, including private property. They are designated as such by the Board of Supervisors, based on criteria such as age, location, species, or visual quality. Once the tree has been designated, a notice indicating this designation is recorded for the property on which the tree is located. The City Zoning Administrator is required to identify landmark trees on proposed development or construction sites, and to notify the Urban Forestry Council and DPW. Special permits are required if the property is later proposed for development.[15] The City Zoning Administrator or other City agency must impose measures to protect landmark trees on a construction site.

A landmark tree, a Moreton Bay fig, is located on the St. Luke's Campus at 3555 Cesar Chavez Street. Wind damaged the tree on or around June 22 or 23, 2009; one large limb broke and fell, in turn breaking several smaller limbs lower on the tree. Arborwell Arborist Services, a contractor to DPW, responded and cleared the tree's fallen limbs. On June 26, 2009, Arborwell cut the broken limb back to the main stem of the tree to prevent further damage.[16]

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[14] Ibid., Section 810A.

[15] Ibid., Section 810.

[16] Short, Carla. Urban Forester. San Francisco Department of Public Works. March 1, 2010—telephone conversation with Sean Avent of AECOM regarding damage and repair of a landmark tree at the St. Luke's Campus.

Authority over Site Development Plans

DPW has the authority to review and comment on site development plan applications received by the City's Central Permit Bureau that pertain to the planting, alteration, or removal of street trees, landmark trees, or significant trees. Unless permits have been obtained for removal, such trees must be protected during construction work that may occur within the dripline, or that might otherwise be adversely affected by excavation, construction, or street work.[17] DPW may require a tree protection plan before approving the permit, if there are trees on the site that are to be preserved through construction.

Specific tree species are required for any replacement of trees on certain streets maintained by DPW, including some of the streets fronting the CPMC campuses. These requirements are noted below by campus in Section 4.13.5, "Impact Evaluations."

San Francisco Planning Code, Section 143

Section 143 of the San Francisco Planning Code (Planning Code) also includes requirements for street trees.[18] All five CPMC campuses are in Residential (R) districts, which have the following requirements in the case of construction of a new building, relocation of a building, or additions of gross floor area equal to 20% or more of existing buildings:

- Street trees must be installed at a minimum of one 24-inch box tree for each 20 feet of property frontage along each street or alley; any remaining fraction greater than 10 feet requires an additional tree.
- The trees must be located within a setback area of the lot or within the public right-of-way.
- For trees installed in the public right-of-way, species and locations are subject to approval by DPW.

4.13.3 CUMULATIVE CONDITIONS

SPECIAL-STATUS SPECIES

The habitats and requirements for the historic special-status species (American badger, California red-legged frog, mission blue butterfly, and San Francisco forktail damselfly) are absent at all CPMC campuses; therefore, none of these wildlife species are expected to occur. Because the campuses are located within developed urban areas, on-site or nearby wildlife species are anticipated to include those species adapted to urban conditions (e.g., mice, raccoons, opossums, skunks), which are not considered rare or endangered, or under legal protection.

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[17] San Francisco Public Works Code, Article 16, "Urban Forestry Ordinance." Available: http://www.municode.com/Resources/gateway.asp?pid=14142&sid=5. Section 808.

[18] San Francisco Planning Code, Article 1.2, Section 143, "Street Trees, R, SPD, RSD, NC, C-3, DTR, MUG, MUO, MUR, UMU, SLR, SLI and SSO Districts." Available: http://www.municode.com/RESOURCES/gateway.asp?pid=14139&sid=5.

PROTECTED BIRDS

None of the campus sites, with the possible exception of the California Campus, are near migratory flight corridors. However, habitat for nesting birds is present on-site at all proposed and existing campuses. Given the numerous mature shrubs and trees on-site and the presence of multistory buildings, the potential for nesting birds to be present is high, as evidenced by the occurrence of multiple bird species and inactive nests throughout the five sites. Bird species observed during biologist field surveys were rock dove (*Columba livia*), American crow (*Corvus rachyrhynchos*), American robin (*Turdus migratorius*), white-crowned sparrow (*Zonotrichia leucophrys*), Anna's hummingbird (*Calypte anna*), and house sparrow (*Passer domesticus*). Many species of ground-nesting birds may use the secluded ornamental grounds and vegetation on the sites as well.

PROTECTED TREES

Landscaping at the CPMC campus sites and the number of trees considered significant at each campus site are as follows:

- The proposed Cathedral Hill Campus is currently landscaped with a total of 106 trees between the three properties: the Cathedral Hill Hospital site (77 trees), the Cathedral Hill MOB site (seven trees), and the 1375 Sutter Street MOB site (22 trees); seven are considered significant.
- The Pacific Campus is currently landscaped with 177 trees and large shrubs; none were identified as significant.
- The California Campus is currently landscaped with 248 trees and large shrubs; none were identified as significant.
- The Davies Campus is currently landscaped with 287 trees; 81 are considered significant.
- The St. Luke's Campus is currently landscaped with 113 trees; 37 are considered significant.

4.13.4 SIGNIFICANCE CRITERIA

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been adopted and modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the project would result in a significant impact on biological resources.

Implementation of the proposed project would have a significant effect on biological resources if it would:

- 13a—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, or by DFG or USFWS;
- 13b—have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by DFG or USFWS;
- 13c—have a substantial adverse effect on 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;
- 13d—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;
- 13e—conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- 13f—conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

4.13.5 IMPACT EVALUATIONS

POLICIES AND ORDINANCES PROTECTING BIOLOGICAL RESOURCES

Operation of the CPMC campuses would be consistent with the biological resources protection policies of the *San Francisco General Plan*. In addition, the City has adopted the Urban Forestry Ordinance and Section 143 of the Planning Code to protect trees as a significant resource to the community. As discussed in Impact BI-1 below, CPMC would comply with the Urban Forestry Ordinance during construction to the extent applicable and, with Mitigation Measures M-BI-N1 (see page 4.13-19) and M-BI-L1 (see page 4.13-22), would ensure that the near-term and long-term projects are constructed in a manner consistent with policies of the Urban Forestry Ordinance and Planning Code Section 143. Consequently, the operation of the CPMC campuses under the LRDP would not conflict with any local policies or ordinances protecting biological resources.

IMPACTS NOT ADDRESSED FURTHER

The sites of the proposed and existing CPMC campuses and the surrounding areas do not contain any protected waters, wetlands, riparian habitat, or other sensitive habitats. Furthermore, there are no conservation plans or policies that would apply to any of the campuses. Therefore, Criteria 13b, 13c, and 13f do not apply and are not addressed further in this section.

IMPACT BI-1

Tree and shrub removal and vegetation clearing required at most of the CPMC campus sites during project construction may potentially disturb nesting birds and could result in destruction of bird nests, a potential violation of the California Fish and Game Code or the Migratory Bird Treaty Act. (Significance Criteria 13a and 13d)

Levels of Significance:

- *Cathedral Hill (with or without project variant): Less than significant with mitigation*
- *Pacific: Less than significant with mitigation*
- *Davies (near term and long term): Less than significant with mitigation*
- *St. Luke’s (with or without either project variant): Less than significant with mitigation*

Near-Term Projects

Construction activities for near-term projects at the sites of the proposed Cathedral Hill Campus and existing Davies and St. Luke’s Campuses would include site preparation (e.g., demolition, excavation, grading, and clearing), basement excavation, trenching, pouring of concrete foundations, paving, frame erection, equipment installation, finishing, and cleanup. No pile driving or rock blasting is anticipated to occur.

◆ Cathedral Hill Campus

Key construction phases at the Cathedral Hill Campus would include demolition, excavation, foundation work, structural work, exterior finishing, and interior work. All perimeter trees—77 at the site of the proposed Cathedral Hill Hospital and four at the site of the proposed Cathedral Hill MOB—would be removed during demolition, but would be replaced after construction in accordance with the Urban Forestry Ordinance and Section 143 of the Planning Code.

Although the movements of resident and migratory birds in San Francisco are poorly known, it is unlikely that the small strips of vegetation along the various CPMC campus parking lots in an urban setting like San Francisco would be considered a vital hub or corridor for daily or seasonal bird movements. The size of the planted areas proposed for the Cathedral Hill Campus (see “Cathedral Hill Campus Streetscape Design, Landscaping, and Open Space” on page 2-34 and Figure 2-37, “Cathedral Hill Campus—Proposed Streetscape Plan,” on page 2-101) would not provide sufficient shelter to support permanent populations, and the proposed vegetated areas would represent a very small portion of the available migratory and resident bird habitat in San Francisco. Additionally, effects on nesting birds would not be an issue with conversion of the Pacific Plaza Office Building into the 1375 Sutter MOB because only interior renovation would occur there.

The only potential for adverse effects on biological resources is the loss or destruction of active bird nests. Bird nesting, protected under the federal MBTA, may occur in the project area. Migratory birds include geese, ducks, shorebirds, raptors, songbirds, and seabirds. As described above, a number of nonnative trees would be removed from the project site. To reduce the potential for effects on nesting birds from removal of nonnative trees, construction should occur outside of bird nesting season (January 15 through August 15). In most areas of California, bird nesting season is generally recognized to be from March 15 through August 15, but the season can begin as early as January 15 in the San Francisco area. Section 3503 of the California Fish and Game Code prohibits the needless destruction of the nests or eggs of any naturally occurring bird, and the MBTA protects the nests, eggs, young, and adults of any migratory bird. Construction-related activity and construction equipment moving around the site could temporarily disturb roosting birds on the campus site and within the immediate vicinity. **This impact would be potentially significant.**

Cathedral Hill Campus with No Van Ness Avenue Pedestrian Tunnel Variant: Eliminating the proposed pedestrian tunnel under Van Ness Avenue would result in slightly fewer near-term construction activities for this campus. However, the reduction in construction activities would not be sufficient to eliminate temporary disturbance of roosting birds or other animal life on the campus site and within the immediate vicinity. Therefore, for the same reasons as discussed above, **this impact would be potentially significant**.

Mitigation Measure for Cathedral Hill Campus (with or without project variant)

M-BI-N1 Before any demolition or construction activities occurring during the nesting season (January 15 through August 15) that involve removal of trees or shrubs, CPMC shall conduct a preconstruction survey for nesting birds at each of its medical campuses. The surveys shall be conducted by a qualified wildlife biologist no sooner than 14 days before the start of removal of trees and shrubs. The survey results shall remain valid for 21 days after the survey; therefore, if vegetation removal is not started within 21 days of the survey, another survey shall be required. The area surveyed shall include the construction site and the staging area for the tree or shrub removal. If no nests are present, tree removal and construction may commence. If active nests are located during the preconstruction bird nesting survey, CPMC shall contact DFG for guidance on obtaining and complying with the Section 1081 agreement, which may include setting up and maintaining a line-of-sight buffer area around the active nest and prohibiting construction activities within the buffer; modifying construction activities; and/or removing or relocating active nests.

Implementing Mitigation Measure M-BI-N1 at the proposed Cathedral Hill Campus would reduce Impact BI-1 to a less-than-significant level because preconstruction surveys would help to ensure that nests of migratory birds would be protected from construction-related disturbance and potential destruction.

◆ Davies Campus

Construction phases at the Davies Campus would include excavation, foundation work, structural work, exterior finishing, and interior work for the proposed Neuroscience Institute building. Project construction would necessitate the removal of approximately 111 trees of various native and nonnative species; these trees would be replaced with new trees and landscaping along Noe Street as part of the project.[19] Some of the trees affected are located within a stand of trees—five redwoods and a Monterey cypress and several smaller trees—east of the service drive where it meets Duboce Avenue. Two of the redwoods would be removed to allow for the proposed development, leaving three redwoods and a cypress in place. Four of the smaller trees surrounding the grove would also be removed to improve the health of the larger trees. The trees proposed for removal are in poor health.[20] Replacement trees would be planted after building construction as part of the landscape improvements along the Noe Street streetscape and in the plaza south of the Neuroscience Institute building, in compliance with the Urban Forestry Ordinance and Section 143 of the Planning Code.

Although the movements of resident and migratory birds in San Francisco are poorly known, it is unlikely that the small strips of vegetation and trees at the Davies Campus in an urban setting like San Francisco would be considered a vital hub or corridor for daily or seasonal bird movements. The size of the planted areas proposed for the Davies Campus landscaping would not provide sufficient shelter to support permanent populations, and the proposed vegetated areas would represent a very small portion of the available habitat for migratory and resident birds in San Francisco. Regardless, some birds could nest in trees on the Davies Campus between January 15 and August 15 of each year. Activities associated with tree removal and clearing of vegetation could potentially disturb nesting birds. Section 3503 of the California Fish and Game Code prohibits the needless destruction of the nests or eggs of any naturally occurring bird, and the MBTA protects the nests, eggs, young, and adults of any migratory bird. Construction-related activity and construction equipment moving around the site could temporarily disturb roosting birds on the campus site and within the immediate vicinity. **This impact would be potentially significant.**

[19] California Pacific Medical Center. 2006 (August). *Final Tree Report, California Pacific Medical Center—Davies Campus.* San Francisco, CA. Prepared by Hortscience Inc., San Francisco, CA. A copy of this report is on file with the San Francisco Planning Department, 1650 Mission Street, San Francisco 94103, and available for review as part of Case File No. 2004.0603E.

[20] Ibid.

Mitigation Measure for Davies Campus (near term)

M-BI-N1 This mitigation measure is identical to Mitigation Measure M-BI-N1 for the Cathedral Hill Campus.

For the same reasons as described for the Cathedral Hill Campus, **implementing Mitigation Measure M-BI-N1 at the Davies Campus would reduce Impact BI-1 to a less-than-significant level**.

◆ St. Luke's Campus

Key construction phases at the St. Luke's Campus would include excavation, foundation work, structural work, exterior finishing, and interior work and demolition of the existing St. Luke's Hospital tower. Approximately 27 perimeter trees would be removed during construction of the St. Luke's Replacement Hospital, but these trees would be replaced afterward in accordance with the Urban Forestry Ordinance and Section 143 of the Planning Code. Removal of the existing St. Luke's Hospital tower may affect an additional seven trees adjacent to the structure and the parking lot to the north.

Although the movements of resident and migratory birds in San Francisco are poorly known, it is unlikely that the small strips of vegetation along the various CPMC campus parking lots in an urban setting like San Francisco would be considered a vital hub or corridor for daily or seasonal bird movements. Trees and vegetation on-site would not provide sufficient shelter to support permanent populations, and the proposed vegetated areas would represent a very small portion of the available migratory and resident bird habitat in San Francisco. Regardless, some birds could nest in trees on the St. Luke's Campus between January 15 and August 15 of each year. Activities associated with tree removal and clearing of vegetation could potentially disturb nesting birds. Section 3503 of the California Fish and Game Code prohibits the needless destruction of the nests or eggs of any naturally occurring bird, and the MBTA protects the nests, eggs, young, and adults of any migratory bird. Construction-related activity and construction equipment moving around the site could temporarily disturb roosting birds on the campus site and within the immediate vicinity. **This impact would be potentially significant.**

St. Luke's Campus with Project Variants: The project variants for the St. Luke's Campus would not change the overall construction footprint for this campus. Therefore, for the same reasons as discussed above, **this impact would be potentially significant**.

Mitigation Measure for St. Luke's Campus (with or without either project variant)

M-BI-N1 This mitigation measure is identical to Mitigation Measure M-BI-N1 for the Cathedral Hill Campus.

For the same reasons as described for the Cathedral Hill Campus, **implementing Mitigation Measure M-BI-N1 at the St. Luke's Campus would reduce Impact BI-1 to a less-than-significant level**.

Long-Term Projects

◆ Pacific and Davies Campuses

It is estimated at this time[21] that 86 trees would probably be removed for the long-term construction projects at the Pacific Campus. Of the total 111 trees proposed for removal at the Davies Campus, about 76 trees would be removed during the long-term project for this campus (the Castro Street/14th Street MOB). Separate project-level EIR analyses for the long-term projects at each campus would be conducted at a later date to confirm which trees would be removed as a result of the projects, determine whether any of those trees have a protected status, outline the requirements of the tree-removal permit process, and address the potential impacts in more detail. An arborist report would also be conducted for each campus at that time. Any trees removed from either campus site would be replaced after construction in accordance with the Urban Forestry Ordinance and Section 143 of the Planning Code. Although the movements of resident and migratory birds in San Francisco are poorly known, it is unlikely that the small strips of vegetation along the various CPMC campus parking lots in an urban setting like San Francisco would be considered a vital hub or corridor for daily or seasonal bird movements.

The only potential for adverse effects on biological resources is the loss or destruction of active bird nests. Bird nesting, protected under the federal MBTA, may occur in the project area. Migratory birds include geese, ducks, shorebirds, raptors, songbirds, and seabirds. As described above, a number of nonnative trees would be removed from the Pacific Campus and Davies Campus project sites. To reduce the potential for effects on nesting birds from removal of nonnative trees, construction should occur outside of bird nesting season (January 15 through August 15). In most areas of California, bird nesting season is generally recognized to be from March 15 through August 15, but the season can begin as early as January 15 in the San Francisco area. Section 3503 of the California Fish and Game Code prohibits the needless destruction of the nests or eggs of any naturally occurring bird, and the MBTA protects the nests, eggs, young, and adults of any migratory bird. Construction-related activity and construction equipment moving around the site could temporarily disturb roosting birds on the campus site and within the immediate vicinity. **This impact would be potentially significant.**

Mitigation Measure for Pacific Campus and Davies Campus (long term)

M-BI-L1 This mitigation measure is identical to Mitigation Measure M-BI-N1, above.

[21] Blair, Steven, P.E. Project executive. Herrero Contractors Inc., San Francisco, CA. September 16, 2009—meeting with Susan Yogi of AECOM to review maps for probable tree removals.

For the same reasons as discussed for the Cathedral Hill Campus, **implementing Mitigation Measure M-BI-L1 at the Pacific and Davies Campuses would reduce Impact BI-1 to a less-than-significant level**.

IMPACT BI-2

The project would require removal of protected trees at most of the CPMC campus sites during construction. However, protected trees would be removed in compliance with the City's Urban Forestry Ordinance and Section 143 of the San Francisco Planning Code, and thus the project would not conflict with any local policies. (Significance Criterion 13e)

Levels of Significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific (long term): Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Operation of the CPMC campuses would be consistent with the biological resources protection policies of the *San Francisco General Plan*. In addition, the City has adopted the Urban Forestry Ordinance and Section 143 of the Planning Code to protect trees as a significant resource to the community. CPMC would comply with the Urban Forestry Ordinance and Planning Code Section 143 during construction to the extent applicable.

Near-Term Projects

◆ Cathedral Hill Campus

No exterior construction is proposed at the 1375 Sutter Street lot for conversion of the Pacific Plaza Office Building into the 1375 Sutter MOB; therefore, trees and vegetation there would remain unaffected and no impacts would result. This lot is not discussed further.

The existing buildings and landscaping (on-grade and roof gardens) at the sites of the proposed Cathedral Hill Hospital and Cathedral Hill MOB would be demolished. The surrounding sidewalks, street trees, and street furnishings would also be removed during construction.[22] There are 84 trees in total at the two sites, 77 at the hospital site and seven at the MOB site, including 53 street trees (46 surrounding the hospital site and seven surrounding the MOB site). All 84 trees at the sites of the proposed Cathedral Hill Hospital and Cathedral Hill

[22] California Pacific Medical Center. 2008b (April 18). *Cathedral Hill Campus Environmental Impact Report Construction Data.* Version 2x. Prepared by Herrero Boldt, San Francisco, CA. P1 Pedestrian Safety Plan, S1 Site Relocation Plan, S2 Site Relocation Plan. This information is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

MOB are proposed for removal, including all 53 street trees and seven significant trees. The seven significant trees are all junipers distributed along the east end of the site of the proposed hospital, with five in the median between Van Ness Avenue and the front drive of the existing hotel north of the parking lot entrance and the other two south of the parking lot entrance between the building and the sidewalk. The junipers range in height from approximately 15 feet to 30 feet.

Additionally, the excavation and construction of the 12-foot-wide tunnel below Van Ness Avenue would damage or require the removal of a portion of the landscaping in the street median (approximately 3 feet in width). This landscaping includes one small tree and minimal landscaping vegetation such as perennial flowers and ground cover. CPMC would obtain a permit for tree removal from DPW, consistent with Article 16, "Urban Forestry Ordinance," of the Public Works Code. The removal permit for a street tree or significant tree requires that an appropriate replacement tree be planted on the project site or along the street, or that an in-lieu fee be paid. Section 143 of the Planning Code dictates that street trees be replaced at the rate of one tree for every 20 feet of street or alley frontage, at a minimum size of a 24-inch box. All perimeter trees would be replaced after construction in accordance with the Urban Forestry Ordinance and Section 143 of the Planning Code. The landscape plan for the public streetscape, currently in concept design only, indicates 99 streetscape trees, including a proposal for a new row of trees in the median of Van Ness Avenue. Additionally, both Geary Boulevard and Van Ness Avenue have required species for replacement plantings: London plane (*Platanus x acerifolia*) on Geary Boulevard and Brisbane box (*Tristania conferta*) on Van Ness Avenue.[23] Once the landscape plan is finalized, CPMC would need to submit it to DPW for review and approval of species, as well as confirmation that the plan meets the removal permit's replacement requirements. As a result, implementation of the LRDP at the Cathedral Hill Campus in the near term would comply with all of the City's regulations related to tree protection. **This impact would be less than significant.**

Cathedral Hill Campus with No Van Ness Avenue Pedestrian Tunnel Variant: With the Van Ness Avenue pedestrian tunnel removed from the Cathedral Hill Campus's near-term projects, none of the existing street median landscaping, which includes small trees and shrubs, would be damaged or removed. However, other trees, including seven significant trees, on the site of the proposed campus would still require removal. CPMC would still finalize and implement a landscape plan for the public streetscape. Therefore, this impact would be similar to but slightly less than the impact of near-term projects described above. **This impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the proposed Cathedral Hill Campus in the near term.

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[23] Devinney, James. Urban forestry inspector. Bureau of Urban Forestry, San Francisco Department of Public Works, San Francisco, CA. September 24 and October 16, 2009—phone call and e-mail to Megan Walker of AECOM regarding Planning Code requirements for street trees and required species replacements.

◆ Davies Campus

A total of 111 trees are proposed for removal as part of construction of projects at the Davies Campus under the CPMC LRDP.[24] About 35 of these trees would be removed as part of the near-term project (the Neuroscience Institute building), as indicated in the final tree report prepared for CPMC by Hortscience Arborists.[25] Of these, 17 are noted as being significant according to the City's criteria. Of these 17, 10 are Monterey pines, two are Monterey cypress, four are Victorian box, and one is a coast redwood. No street trees are proposed for removal in the near term. Sixteen of the 17 significant trees are located on the eastern edge of the property adjacent to Noe Street from the middle of the block to Duboce Avenue. The 17th tree, the coast redwood, is located adjacent to Duboce Avenue, just west of the current parking lot entrance. The final tree report identified 16 other existing trees on the campus that may be affected by near-term construction, including eight that are noted as being significant, and recommended for preservation and protection to the extent possible. These trees would be replaced with new trees and landscaping along Noe Street as part of the project. Many of the trees proposed for removal are in poor health.

CPMC would need to prepare a tree protection plan as part of the construction plans for the Neuroscience Institute building, addressing all trees potentially adversely affected by construction that are not permitted for removal. For trees to be removed, CPMC would obtain a permit for tree removal from DPW, consistent with Article 16, "Urban Forestry Ordinance," of the Public Works Code. Removal of street trees or significant trees requires that an appropriate replacement tree be planted on the project site or along the street, or that an in-lieu fee be paid. Section 143 of the Planning Code dictates that street trees be replaced at the rate of one tree for every 20 feet of street or alley frontage, at a minimum size of a 24-inch box. Replacement trees would be brush box (*Lophostemon confertus*), which is the DPW-designated species for the streets surrounding the Davies Campus (Duboce Avenue and Noe, 14th, and Castro Streets).[26]

CPMC would submit a final landscape plan to DPW, which would review the plan for compliance with the Urban Forestry Ordinance and Section 143 of the Planning Code and approve the plan before construction. As a result, implementation of the LRDP at the Davies Campus in the near term would comply with the City's regulations related to tree protection. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the near term.

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[24] Blair, Steven, P.E. Project executive. Herrero Contractors Inc., San Francisco, CA. September 16, 2009—meeting with Susan Yogi of AECOM to review maps for probable tree removals.

[25] California Pacific Medical Center. 2006. *Final Tree Report, California Pacific Medical Center—Davies Campus.* San Francisco, CA. Prepared by Hortscience Inc., San Francisco, CA. Pages 10–11. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and is available for public review as part of the project file, in Case No. 2005.0555E.

[26] Devinney, James. Urban forestry inspector. Bureau of Urban Forestry, San Francisco Department of Public Works, San Francisco, CA. September 24 and October 16, 2009—phone call and e-mail to Megan Walker of AECOM regarding Planning Code requirements for street trees and required species replacements.

St. Luke's Campus

A total of 28 trees would probably be removed as part of construction of projects at the St. Luke's Campus under the CPMC LRDP. Of the 37 significant trees on the campus, 14 significant trees[27] located along San Jose Avenue and Cesar Chavez Street, at the location of the proposed St. Luke's Replacement Hospital, are planned for removal. A total of eight trees adjacent to the existing St. Luke's Hospital tower, five of which have been identified as significant, are located along Cesar Chavez Street and San Jose Avenue and would be removed during demolition to make way for the MOB/Expansion Building.

Because existing trees on the campus that are not planned for removal may be affected by near-term construction, CPMC would need to submit a tree protection plan to DPW and implement the plan. The City may require additional protection for the landmark tree on the campus in front of the 1957 Building along Valencia Street (see the discussion of landmark trees on page 4.13-14). Because this landmark tree would not be removed, impacts would be less than significant. Additionally, Improvement Measure I-BI-N2, below, would ensure that a tree protection plan would be implemented to protect the existing landmark tree during construction at St. Luke's Campus.

For trees to be removed, CPMC would obtain a permit for tree removal from DPW, consistent with Article 16, "Urban Forestry Ordinance," of the Public Works Code. The removal of a street or significant tree would require that an appropriate replacement tree be planted on the project site or along the street, or that a fee be paid in-lieu. Section 143 of the Planning Code dictates that street trees be replaced at the rate of one tree for every 20 feet of street or alley frontage, at a minimum size of a 24-inch box. DPW requires that trees on Valencia Street be replaced by Brisbane box (*Tristania conferta*). Cesar Chavez Street would also have a required species, although the street is currently being redesigned and the species is not yet determined. CPMC would need to submit a final landscape plan to DPW for review for compliance with these City policies and approval before construction. As a result, implementation of the LRDP at the St. Luke's Campus in the near term would comply with the City's Urban Forestry Ordinance. **This impact would be less than significant**.

St. Luke's Campus with Project Variants: The project variants for the St. Luke's Campus would not change the overall construction footprint for this campus. Therefore, for the same reasons as described above, **this impact would be less than significant**.

[27] Mature trees greater than 12 inches in diameter at 4.5 feet above grade (i.e., 12 inches dbh).

Improvement Measure for St. Luke's Campus (with or without either project variant)

I-BI-N2 As an improvement measure, CPMC would prepare a tree protection plan to be submitted to DPW as part of the construction plans for the St. Luke's Campus. The landmark tree located directly east of the 1957 Building, fronting Valencia Street, is not proposed for removal; therefore, impacts on the landmark tree would be less than significant. However, a tree protection plan would be implemented to further protect the existing landmark tree from potential adverse construction impacts that could affect the health of the tree. Through consultation of a certified arborist, CPMC would implement a Tree Protection Zone (TPZ) around the landmark tree during demolition and construction activities. The TPZ would be determined by the certified arborist at the time the work is done. During the various construction phases, the TPZ should follow all of the measures outlined below:

- Install and maintain construction fencing to prevent entry to the TPZ.
- Install wood chip mulch over all exposed soil areas within the TPZ.
- Prohibit placement of any construction vehicle within the TPZ.
- Do not store materials, excavation tailing, or debris within the TPZ, unless placed on a thick plywood root buffer.
- If trenching or grading takes place within the TPZ, ensure that the project arborist will review the proposed work and retain the arborist on-site during that aspect of the work.

The arborist report and tree protection plan would be reviewed by DPW's Bureau of Urban Forestry to verify that the specified protections would be adequate to protect the landmark tree. The Bureau of Urban Forestry would also monitor the project site during demolition and construction activities to ensure that the protection measures outlined in the tree protection plan are being implemented and are adequate, and that the landmark tree would not be damaged.

Implementing Improvement Measure I-BI-N2 at the St. Luke's Campus would further reduce less-than-significant impact (Impact BI-2) by ensuring implementation of a tree protection plan to protect the existing landmark tree.

Long-Term Projects

◆ Pacific Campus

It is estimated at this time[28] that 86 trees would probably be removed for the long-term construction projects at the Pacific Campus. A project-level EIR analysis for those projects would be conducted at a later date to confirm which trees would be removed as a result of the projects, determine whether any of those trees have a protected status, outline requirements of the tree-removal permit process, and address the potential impacts in more detail. An arborist report would also be conducted at that time.

CPMC would also prepare a tree protection plan as part of future construction plans, addressing all trees that may be adversely affected by construction but are not permitted for removal. Any removal of protected trees would comply with the permitting and replacement requirements of the City's Urban Forestry Ordinance (Article 16) and Section 143 of the Planning Code. The removal permit for a street tree or significant tree requires that an appropriate replacement tree be planted on the project site or along the street, or that an in-lieu fee be paid. Section 143 of the Planning Code dictates that street trees be replaced at the rate of one tree for every 20 feet of street or alley frontage, at a minimum size of a 24-inch box. Any street tree replacements on Sacramento Street (where it borders the Pacific Campus) would be the DPW-required tree species: London plane (*Platanus x acerifolia*) between Buchanan Street and Webster Street and Victorian box (*Pittosporum undulatum*) between Webster Street and Fillmore Street.[29]

CPMC would submit a final landscape plan to DPW, which would review the plan for compliance with the Urban Forestry Ordinance and Section 143 of the Planning Code and approve the plan before construction. As a result, implementation of the LRDP at the Pacific Campus in the long term would comply with the City's policies. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at the Pacific Campus in the long term.

◆ Davies Campus

Of the total 111 trees proposed for removal at the Davies Campus, 76 trees are proposed to be removed during the long-term project (the Castro Street/14th Street MOB). The trees proposed for removal are in poor health.[30] New

[28] Blair, Steven, P.E. Project executive. Herrero Contractors Inc., San Francisco, CA. September 16, 2009—meeting with Susan Yogi of AECOM to review maps for probable tree removals.

[29] Devinney, James. Urban forestry inspector. Bureau of Urban Forestry, San Francisco Department of Public Works, San Francisco, CA. September 24 and October 16, 2009—phone call and e-mail to Megan Walker of AECOM regarding Planning Code requirements for street trees and required species replacements.

[30] California Pacific Medical Center. 2008. *Cal Pacific Davies Tree Survey 2008*. San Francisco, CA. Prepared by Frank and Grossman, San Francisco, CA. A copy of this report is on file with the San Francisco Planning Department, 1650 Mission Street, San Francisco 94103, and available for review as part of Case File No. 2005.0555E.

trees, such as ginkgo and Chinese elm, bamboo, and shrubs, would be planted to provide screening for the Davies Campus. Adjacent to the main entrance on the south side of the proposed Neuroscience Institute building, the proposed plaza would be landscaped with perpendicular rows of flowering pear trees. A more in-depth project-level EIR analysis, including an arborist report and tree-specific health reevaluation, for those projects would be conducted separately at a later date to identify significant and street trees, determine which trees are proposed for removal and whether any of those trees have a protected status, and address the potential impacts. The required removal and replacement permit process would be the same as that described for the near-term projects at the Davies Campus. As a result, implementation of the LRDP at the Davies Campus in the long term would comply with the City's policies. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the long term.

4.13.6 Cumulative Impacts

Because the sites of the proposed and existing CPMC campuses are located in dense, long-developed, urban areas and do not contain any waters, wetland, riparian habitat, or other sensitive habitat, no significant cumulative impacts are anticipated. Although the urban landscaping of the campuses provides some habitat value for protected wildlife (primarily shelter for birds), urban landscape habitat of similar quality can be found throughout San Francisco. With implementation of project-specific Mitigation Measure M-BI-1, the project's contribution to the overall cumulative effect would be reduced. CPMC would submit a final landscape plan to DPW for each campus, which would review the plan for compliance with the Urban Forestry Ordinance and Section 143 of the Planning Code and approve the plan before construction. Therefore, **cumulative impacts related to biological resources would be less than significant.**

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4.14 GEOLOGY AND SOILS

This section describes the geologic and seismic (earthquake-related hazards) environment associated with the proposed CPMC *Long Range Development Plan* (LRDP). This section describes the geologic, seismic, soils, and topographic conditions at and near each CPMC campus; assesses the potential impacts from strong ground shaking, liquefaction, differential settlement, and unstable or expansive soils; identifies mitigation measures for impacts where applicable; and considers cumulative impacts. Please refer to Chapter 2, "Project Description," for campus-specific details regarding the excavation depths and amount of soil to be excavated at each campus.

Information in this section is based on the site-specific geotechnical and soils investigations prepared by Treadwell & Rollo and URS for CPMC,[1] as well as published regional information and previously collected data. The geotechnical and soils investigations are based on previous site-specific geotechnical and hazardous materials investigations, some of which include subsurface borings, laboratory testing, and review of published geologic reports and maps. The geotechnical investigations describe and evaluate geologic and geotechnical conditions at each campus to support preliminary planning and conceptual-level design during initial phases of project planning. Design-level geotechnical studies would be completed for each of the existing and the proposed CPMC campuses during development of construction plans.

4.14.1 ENVIRONMENTAL SETTING

REGIONAL GEOLOGY

San Francisco Bay and the alluvial (stream-laid), colluvial (slope wash), and estuarine deposits that underlie much of the land composing the CPMC campus sites (and surrounding areas) occupy a structurally controlled basin in California's Coast Ranges province, which consists of approximately 500 miles of northwest-trending ridges and valleys.[2] Late Pleistocene and Holocene sediments (less than 1.0 million years old) were deposited in the basin as it subsided and form the soils present at the surface. At the CPMC campus sites, these sediments consist of estuarine deposits of Old Bay Clay, undifferentiated sedimentary deposits, Young Bay Mud, and alluvial/colluvial deposits, including wind-deposited dune sand. Additionally, artificial fill (historic debris materials) is also present at some sites. Those surface geologic materials all rest on top of a variety of older bedrock types associated with the Franciscan Complex. The Franciscan Complex makes up much of the basement rock of the Coast Ranges and consists of an assemblage of deformed and metamorphosed (altered by heat and pressure) rock units. Most of the

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1 These documents are on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and are available for public review as part of the project file, in Case No. 2005.0555E.

2 San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Draft Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department Case No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Page III.L-2.

San Francisco Peninsula is underlain by Franciscan Complex bedrock of mid-Cretaceous to Jurassic age, mainly sandstone, shale, chert, greenstone, and sheared rock, with serpentinite in some areas.[3]

REGIONAL SEISMICITY

The San Francisco Bay Area is in a seismically active region near the boundary between two major tectonic plates, the Pacific Plate to the southwest and the North American Plate to the northeast.[4] These two plates move relative to each other in a predominantly lateral manner, with the San Andreas Fault Zone at the junction. The Pacific Plate, on the west side of the fault zone, is moving north relative to the North American Plate on the east. Since approximately 23 million years ago, about 200 miles of right-lateral slip has occurred along the San Andreas Fault Zone to accommodate the relative movement between these two plates. The relative movement between the Pacific and the North American Plates generally occurs across a 50-mile zone extending from the San Gregorio Fault in the southwest to the Great Valley Thrust Belt to the northeast. In addition to the right-lateral slip movement between tectonic plates, a compressional component of relative movement has developed between the Pacific Plate and a smaller segment of the North American Plate at the latitude of San Francisco Bay during the last 3.5 million years. Strain produced by the relative motions of these plates is relieved by right-lateral strike-slip faulting on the San Andreas and related faults, and by vertical reverse-slip displacement on the Great Valley and other thrust faults in the central California area.

The region's seismic faults can be classified as historically active, active, sufficiently active and well defined, or inactive,[5] as defined below:

- *Historically active* faults are faults that have generated earthquakes accompanied by surface rupture during historic time (approximately the last 200 years) or that exhibit a seismic fault creep (slow incremental movement along a fault that does not entail earthquake activity).
- *Active* faults show geologic evidence of movement within Holocene time (approximately the last 11,000 years).
- *Sufficiently active and well-defined* faults show geologic evidence of movement during the Holocene along one or more of their segments or branches, and their trace may be identified by direct or indirect methods.

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[3] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. This document is on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and are available for public review as part of the project file, in Case No. 2005.0555E.

[4] Ibid., page III.L-11.

[5] California Geological Survey. 2007. *Fault-Rupture Hazard Zones in California, Interim Revision 2007*. Special Publication No. 42. Sacramento, CA.

- *Inactive* faults show direct geologic evidence of inactivity (that is, no displacement) during all of Quaternary time or longer.

Although it is difficult to quantify the probability that an earthquake will occur on a specific fault, the preceding classification is based on the assumption that if a fault has moved during the last 11,000 years, it is likely to produce earthquakes in the future. The major regional active faults considered likely to produce damaging earthquakes in San Francisco are the San Andreas, San Gregorio, Hayward, and Calaveras Faults, which are shown in Figure 4.14-1, "Major Faults and Earthquake Epicenters" (page 4.14-4), along with other regional faults. Table 4.14-1, "Regional Faults and Seismicity" (page 4.14-5), summarizes the nearest of the active faults.

An earthquake can be classified quantitatively by the amount of energy released or qualitatively by the intensity of its effects on the surface. Energy releases are directly related to the average slip and fault rupture area.[6] The amount of energy released during a seismic event has traditionally been quantified using the Richter scale. Recently, seismologists have begun using a moment magnitude (M_N) scale, developed in 1979, because it provides a more accurate measurement of the size of major and great earthquakes. For earthquakes of less than M_N 7.0, the moment magnitude and Richter magnitude scales are nearly identical. For earthquake magnitudes greater than M_N 7.0, readings on the moment magnitude scale are slightly greater than a corresponding Richter magnitude.[7]

Seismicity in the region is related to fault activity on the San Andreas Fault system. Several large-magnitude earthquakes have occurred on this fault system in the San Francisco area since 1800, including a 7.0-Richter-magnitude earthquake in 1838, the 7.9-magnitude 1906 San Francisco Earthquake, the 5.4-magnitude 1957 Daly City Earthquake, and the 6.9-magnitude 1989 Loma Prieta Earthquake. The two most consequential were the 1906 San Francisco Earthquake and the 1989 Loma Prieta Earthquake. The 1906 San Francisco Earthquake caused building collapses and fires, approximately 3,000 deaths, and $524 million in damage, extending as far as 350 miles from the epicenter. The 1989 earthquake caused 63 deaths, more than 3,000 injuries, and an estimated $6 billion in property damage from San Francisco to Monterey and in the East Bay, including damage and destruction of buildings, roads, bridges, and freeways. Between 1800 and 2005, 25 earthquakes with magnitudes between M_N 5.5 and M_N 6.0 occurred in the San Francisco area, including numerous aftershocks of larger earthquakes.

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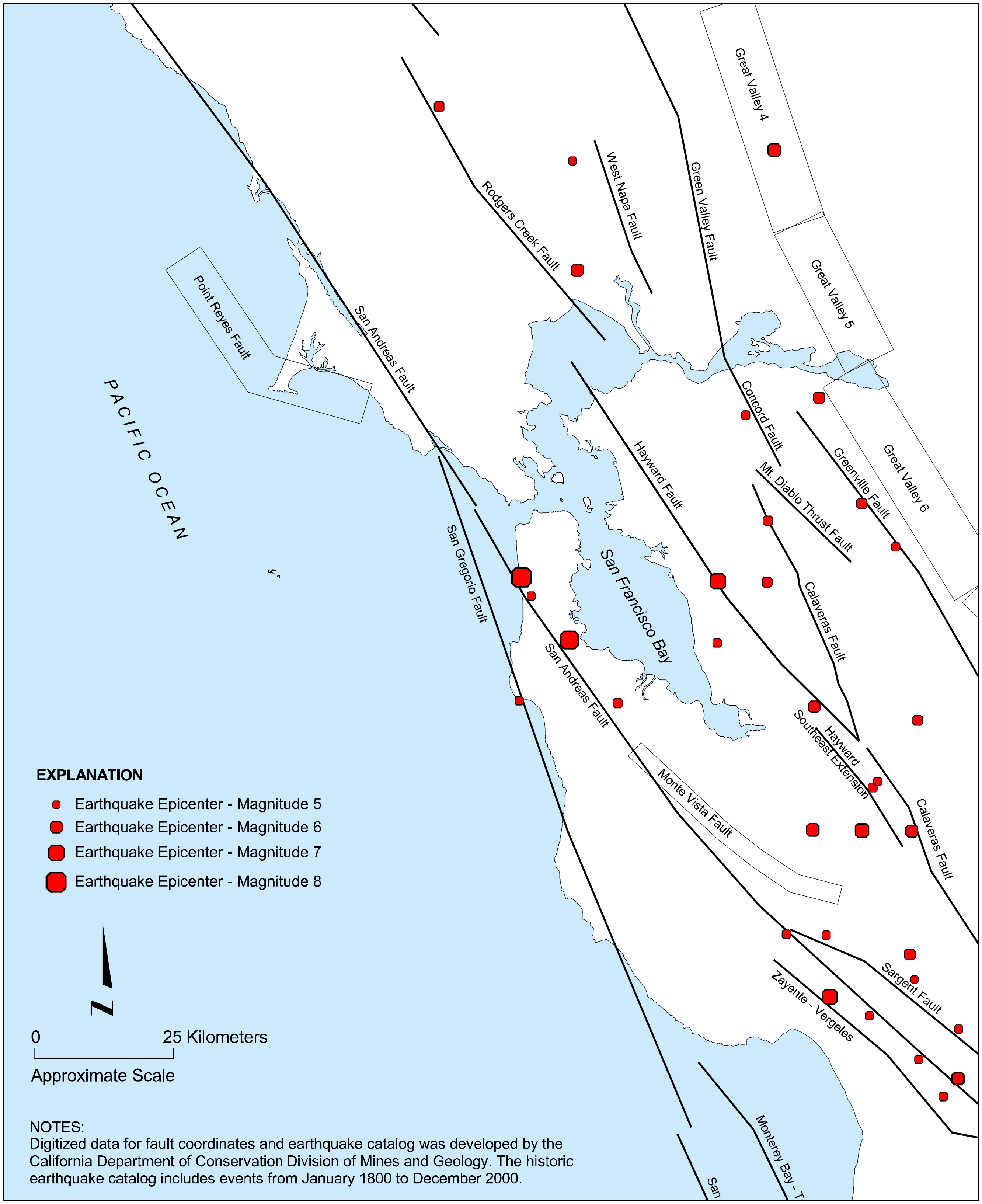
[6] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[7] U.S. Geological Survey. 2009. Earthquake Hazards Program, FAQ. Available: http://earthquake.usgs.gov/learning/faq.php?categoryID=2&faqID=23. Accessed April 23, 2009.



Source: California Pacific Medical Center. 2009b. *Geotechnical Consultation, California Pacific Medical Center (CPMC)—Cathedral Hill Campus, Van Ness Avenue Connector Tunnel, San Francisco.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

Major Faults and Earthquake Epicenters in the San Francisco Bay Area **Figure 4.14-1**

Table 4.14-1
Regional Faults and Seismicity

Fault	Approximate Distance from San Francisco (miles)	Direction from San Francisco	Mean Characteristic Moment Magnitude (M_N)
San Andreas–1906 Rupture	7	West	7.9
San Andreas–Peninsula	7	West	7.2
San Gregorio	10	West	7.4
Hayward	11	East	6.9
Hayward–Rodgers Creek	11	East	7.3
Rodgers Creek	20	North	7.0
Mount Diablo	22	East	6.7
Calaveras	22	East	6.9
Concord/Great Valley	25	East	6.7
Point Reyes	25	West	6.8
Monte Vista–Shannon	26	Southeast	6.8
West Napa	28	Northeast	6.5
Greenville	33	East	6.9
Hayward–Southeast Extension	36	Southeast	6.4
Great Valley 6	39	East	6.7
Great Valley 5	42	East	6.5
Great Valley 4	45	Northeast	6.6
Hunting Creek–Berryessa	48	Northeast	6.9
San Andreas–Santa Cruz Mountains	48	Southeast	7.0
Great Valley 7	50	East	6.7
Sargent	52	Southeast	6.8
Zayante–Vergeles	54	Southeast	6.8
Monterey Bay–Tularcitos	62	Southeast	7.1

Source: California Pacific Medical Center. 2004. *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

GROUND SHAKING

The intensity of the seismic shaking during an earthquake depends on the distance and direction to the earthquake's epicenter, the magnitude of the earthquake, and the area's geologic conditions. Earthquakes occurring on faults closest to the existing and proposed CPMC campuses would have the potential to generate the largest ground motions at those sites. A commonly used measure of earthquake intensity is the Modified Mercalli Intensity (MMI) scale, which is a subjective qualitative measure of the strength of an earthquake at a particular place as determined by its effects on objects and people at the Earth's surface. Table 4.14-2, "Modified Mercalli Intensity Scale," below provides a description of the effects of earthquakes based on their level on the MMI scale.

Table 4.14-2
Modified Mercalli Intensity Scale

Intensity	Effect
I	Not felt. Marginal and long period effects of large earthquakes.
II	Felt by persons at rest, on upper floors, or favorably placed.
III	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV	Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV, wooden walls and frame creak.
V	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.
VI	Felt by all. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry D cracked. Small bells ring (church, school). Trees, bushes shaken (visibly, or heard to rustle).
VII	Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments). Some cracks in masonry C. Waves on ponds; water turbid with mud. Small slides and caving in along sand or gravel banks. Large bells ring. Concrete irrigation ditches damaged.
VIII	Steering of motor cars affected. Damage to masonry C; partial collapse. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX	General panic. Masonry D destroyed; masonry C heavily damaged, sometimes with complete collapse; masonry B seriously damaged. (General damage to foundations.) Frame structures, if not bolted, shifted off foundations. Frames racked. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground. In alluvial areas sand and mud ejected, earthquake fountains, sand craters.
X	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks of canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI	Rails bent greatly. Underground pipelines completely out of service.
XII	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into the air.

Notes:
Masonry A: Good workmanship, mortar, and design; reinforced, especially laterally, and bound together by using steel, concrete, etc.; designed to resist lateral forces.
Masonry B: Good workmanship and mortar; reinforced, but not designed in detail to resist lateral forces.
Masonry C: Ordinary workmanship and mortar; no extreme weaknesses like failing to tie in at corners, but neither reinforced nor designed against horizontal forces.
Masonry D: Weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally.
Source: Association of Bay Area Governments. 2003. Modified Mercalli Intensity Scale. Available: http://www.abag.ca.gov/bayarea/eqmaps/doc/mmi.html. Accessed November 20, 2009.

In 2007, the U.S. Geological Survey (USGS) predicted that a 63% chance of a magnitude 6.7 earthquake or greater would occur in the San Francisco Bay Area in 30 years. Table 4.14-3, "USGS Estimates of the 30-Year Probability (2007–2037) of a Magnitude 6.7 or Greater Earthquake," presents more specific estimates of the probabilities for various faults in the region, which were used in the seismic hazards analyses prepared for the existing and proposed CPMC campuses. See the "Regional Seismicity" section above for details on scales of measurement for ground shaking.

Table 4.14-3
USGS Estimates of the 30-Year Probability (2007–2037) of a Magnitude 6.7 or Greater Earthquake

Fault	Probability (percent)
Hayward–Rodgers Creek	31
San Andreas	21
Calaveras	7
San Gregorio	6
Concord–Green Valley	3
Greenville	3
Mount Diablo	1

Note: USGS = U.S. Geological Survey.
Sources: California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.
California Pacific Medical Center. 2009. *Updated Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, CA.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

SITE-SPECIFIC SEISMICITY

To quantify the estimated ground shaking that would occur at a specific location, seismic hazards analyses were conducted for the CPMC campus sites. Analyses of seismic hazards can be either "deterministic" (when a particular earthquake scenario is assumed) or "probabilistic" (when uncertainties in earthquake size, location, and time of occurrence exist):

- **Probabilistic seismic hazard analysis (PSHA):** Because the location, recurrence interval, and magnitude of future earthquakes are not known, PSHAs are conducted to identify a uniform site-specific hazard in terms of a probability that a particular level of shaking will be exceeded during the life of a project. The analyses are based on the seismicity, location, and geometry of each source, along with empirical relationships that describe the rate and attenuation of strong ground motion with increasing distance from the source. The probabilistic approach offers a rational framework for risk management by accounting for the frequency or probability of exceedance of the ground motion against which a structure or facility is designed. In accordance with the California Building Code (CBC) and the San Francisco Building Code (SFBC), PSHAs are performed to determine a site-specific response spectrum for a 2% probability of exceedance in 50 years. PSHAs are represented graphically.

- **Deterministic seismic hazard analysis (DSHA):** DSHAs use the site-specific geology and seismic history of known regional faults, and then graphically determine the response spectrum during the strongest amount of ground motion a site would be estimated to experience from the maximum-magnitude earthquake, regardless of time.

The PSHA and DHSA analyses are carried out to identify the maximum considered earthquake (MCE) that will affect a site. The analyses are used as a design guideline for a structure and help designers determine the maximum level of ground shaking reasonable to design structures to resist. In accordance with requirements in the CBC, SFBC, and the Office of Statewide Health Planning and Development (OSHPD), the MCE response spectrum for a project site corresponds to the lesser of 2% probability of exceedance in 50 years (determined by the PSHA) or 84th percentile of the deterministic event (determined from the DSHA).

Once the MCE has been determined for a site, the PSHAs and DSHAs determine the site-specific response spectrum, which is used as the basis for the seismic design requirements of proposed structures to withstand seismic forces. These seismic forces then are generally related to the stiffness or flexibility level of any particular structure and are determined using vibration length (short and long) for reference rock types. The results of these calculations are used by geotechnical and structural engineers to determine the appropriate types of structural designs for a specific project site. The estimated ground shaking at the Cathedral Hill, Davies, and St. Luke's Campuses have been evaluated appropriately by a licensed geotechnical engineer according to the CBC and SFBC. No updated seismic design calculations were conducted for the Pacific Campus or California Campus because no near-term projects are proposed for the Pacific Campus and no near-term or long-term projects are proposed for the California Campus. However, the geotechnical evaluation for the Pacific Campus will need to be updated consistent with the most current version of the CBC and SFBC before implementation of the proposed long-term projects. Additionally, project-specific environmental review would be required before approval of long-term projects at the Pacific and Davies Campuses.

FAULT RUPTURE

Faults are geologic zones of weakness along which horizontal and/or vertical movement of the earth is concentrated.[8] Surface rupture occurs when movement on a fault deep in the earth breaks through to the ground surface. Surface ruptures on the San Andreas Fault associated with the 1906 San Francisco Earthquake extended

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8 San Francisco Redevelopment Agency and San Francisco Planning Department. 2009 (November 12). *Candlestick Point–Hunters Point Shipyard Phase II Development Plan Draft Environmental Impact Report.* Redevelopment Agency File No. ER06.05.07. Planning Department Case No. 2007.0946E. State Clearinghouse No. 2007082168. San Francisco, CA. Page III.L-12.

for more than 260 miles, with lateral surface displacements of up to 21 feet. Not all earthquakes result in surface rupture. For example, while the 1989 Loma Prieta Earthquake caused major damage in the San Francisco Bay Area from ground shaking and related earthquake effects, the fault trace does not appear to have broken at the ground surface, as there was no visible vertical or horizontal displacement of the ground. Fault rupture almost always follows preexisting faults, which are zones of weakness. Rupture may occur suddenly during an earthquake or slowly in the form of fault creep (the slow rupture of the earth's crust). Sudden displacements are more damaging to structures because they physically displace the foundation and are accompanied by strong shaking.

No earthquake fault rupture zones have been mapped within San Francisco.[9] Neither active faults nor extensions of active faults are known to exist beneath the properties comprising the proposed Cathedral Hill Campus or beneath the existing Pacific, California, Davies, and St. Luke's Campuses. No evidence of faulting was observed in historic earthquakes at any of these campus sites or by review of aerial photographs and site geological reconnaissance. Accordingly, the geotechnical investigations determined that the risk of surface rupture is very low at the location of the proposed Cathedral Hill Campus and the existing locations for the Pacific, California, Davies, and St. Luke's Campuses.[10, 11, 12, 13, 14, 15, 16, 17]

SITE-SPECIFIC SOIL AND GROUNDWATER CONDITIONS

The results of geotechnical investigations conducted at the sites of the proposed and existing CPMC campuses are summarized for each CPMC campus site below.

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[9] California Geological Survey. 2007. *Fault Rupture Hazard Zones in California.* Special Publication 42. Sacramento, CA.

[10] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[11] California Pacific Medical Center (Sutter Health/CPMC). 2009 (October 2). *Updated Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[12] California Pacific Medical Center. 2009 (March 24). *Geotechnical Consultation, California Pacific Medical Center (CPMC)—Cathedral Hill Campus, Van Ness Avenue Connector Tunnel, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[13] California Pacific Medical Center (Sutter Health). 2009 (March 19). *Geotechnical Investigation, Castro/14th Streets Medical Office Building and 14th/Noe Streets Temporary Parking Garage CPMC—Davies Campus, San Francisco, California*, San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[14] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, Pacific Campus, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[15] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, California Campus, California Pacific Medical Center, San Francisco, California*, San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 18.

[16] Gilpin Geosciences. 2008 (December 12). *Geologic Hazard Investigation, St. Luke's Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco. Appendix A in: California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, San Francisco, California. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[17] California Pacific Medical Center (Sutter Health/CPMC). 2010 (February 26). *Geology and Geotechnical Input for Environmental Impact Report, Medical Office Building, St. Luke's Replacement Hospital, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

Cathedral Hill Campus

Several locations at the proposed Cathedral Hill Campus were analyzed during the geotechnical investigation for this campus: the location of the proposed Cathedral Hill Hospital, the location of the proposed Cathedral Hill Medical Office Building (MOB), and the location of the proposed pedestrian tunnel beneath Van Ness Avenue. A geotechnical investigation was not prepared for the Pacific Plaza Office Building (the site of the proposed 1375 Sutter MOB) because no structural modifications would be required or carried out, and only minor nonstructural changes would be made to the building's interior. The results of the geotechnical investigations at the campus are summarized below.

- **Cathedral Hill Hospital Site:** The geotechnical investigation at the proposed hospital site included 18 soil borings and five cone penetration test (CPT) soundings. The investigation uncovered an inconsistent layer of artificial fill containing brick fragments and other debris between 8 and 9 feet thick overlying a 30- to 60-foot-thick layer of fine- to medium-grained, poorly graded, very loose to medium-dense dune sand. The dune sand increases in density with depth and is thicker on the northern portion of the site. Beneath the dune sand is a buried soil layer consisting of 1.5 to 3.5 feet of stiff to hard clay to sandy clay overlying 4–10 feet of medium-dense to very dense sandy clay to clayey sand. The deepest unit encountered is the very dense sand layer of the Colma Formation, with predominantly localized medium-dense to dense zones. One boring, however, in the northwest portion of the site revealed the highly weathered, intensely fractured weak bedrock of the Franciscan sandstone and shale at 114 feet below ground surface.[18]

- **Cathedral Hill MOB Site:** The two geotechnical investigations at this site included six soil borings, two of which were converted to piezometers to measure groundwater depth and flow, and one CPT sounding. Artificial fill at the proposed Cathedral Hill MOB site is also inconsistent and composed of loose to medium-dense sand containing debris. The 3- to 13-foot-thick fill layer overlies 37–49 feet of fine-grained dune sand, which increases in density from very loose to very dense with depth. As at the proposed Cathedral Hill Hospital site, a buried soil layer consisting of clay, sandy clay, and clayey sand several feet to 10.5 feet thick underlies the dune sand and overlies the Colma Formation at the proposed Cathedral Hill MOB site. The dense to very dense sand with varying amounts of stiff to very stiff sandy clay of the Colma Formation is the deepest unit encountered (to depths of approximately 121 feet below ground surface) in the borings at the site of the proposed Cathedral Hill MOB.[19]

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[18] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[19] California Pacific Medical Center. 2005 (April 4). *Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 9.

- **Van Ness Avenue Pedestrian Tunnel Site:** This geotechnical consultation included no additional borings, instead relying on interpolation of data from the sites of the proposed hospital and MOB locations and described above. Existing subsurface data for the tunnel area indicate that it is underlain by 8–20 feet of fine-grained dune sand that is loose to medium-dense in the upper 10–15 feet below ground surface, and then becomes dense to very dense at depth. The dune sand is underlain by a layer of stiff ancient clayey topsoil that overlies 3–6 feet of very stiff to hard sandy clay, which is anticipated to pinch out just east of the proposed tunnel. This layer is primarily underlain by sand with varying amounts of clay and silt of the Colma Formation, that contain discontinuous layers of medium-dense to dense clayey and silty sand to the maximum depth studied (approximately 90 feet below ground surface).[20]

Groundwater near the sites of the proposed Cathedral Hill Hospital and Cathedral Hill MOB has been encountered at 50–95 feet below ground surface.[21, 22, 23]

Pacific Campus

The geotechnical investigation of the proposed Ambulatory Care Center (ACC), ACC Addition, and North-of-Clay Aboveground Parking Garage at the Pacific Campus sites included 18 soil borings, three of which were converted into monitoring wells to monitor seasonal groundwater fluctuations. The investigation determined that the sites are typically underlain by 7–20 feet of sand with a very low fine fraction (silt and clay) content, which likely originated as dune sand. The majority of the upper portion of the native sand has been covered with fill material. Dense to very dense sand with varying amounts of stiff clay, referred to as “slope deposits” by geologic maps of the area, underlies the dune sand and ranges from several feet thick at the east side to more than 70 feet thick at the west side. The slope deposits are underlain by the deeply weathered shale and sandstone bedrock of the Franciscan Complex, which slopes from east to west.

Groundwater level falls from an elevation[24] of 260 feet just west of Buchanan Street to 180 feet west of Webster Street. The groundwater is approximately 25–40 feet below ground surface.[25]

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[20] California Pacific Medical Center. 2009 (March 24). *Geotechnical Consultation, California Pacific Medical Center (CPMC)—Cathedral Hill Campus, Van Ness Avenue Connector Tunnel, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[21] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California. San Rafael, CA.* Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[22] California Pacific Medical Center. 2005 (April 4). *Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 9.

[23] California Pacific Medical Center. 2009 (March 24). *Geotechnical Consultation, California Pacific Medical Center (CPMC)—Cathedral Hill Campus, Van Ness Avenue Connector Tunnel, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[24] Elevations throughout this report are referenced to San Francisco City datum.

California Campus

The geotechnical investigation for the California Campus was based on 23 previous soil borings and included an additional 19 soil borings, three of which were converted into monitoring wells to monitor seasonal groundwater fluctuations. Typically, the sediment beneath the campus consists of 2–28 feet of very loose to medium-dense fill and native dune sand with a small fines content and containing brick and other debris. The fill and dune sand increases in density with depth and is underlain by the clay and sand mixture of the Colma Formation. The Colma Formation ranges from about 12 feet to 90 feet thick. Upper clay layers of the Colma Formation are medium stiff to hard and range from 5 feet to 13 feet thick, while sand layers are medium dense to very dense. The sand contains discontinuous layers of stiff to hard clay and silt. The Colma Formation is underlain by bedrock of the Franciscan Complex, composed primarily of shale and sandstone with some siltstone and greenstone. Up to 13 feet of the upper portions of the bedrock are severely weathered. Depth to top of bedrock ranges from 130 feet to 232 feet below ground surface across the site, sloping downward toward the south.

The groundwater level slopes downward toward the south/southwest and ranges in elevation from 175 feet to 230 feet. The groundwater level ranges in depth from approximately 32 feet below ground surface to 53 feet below ground surface.[26]

Davies Campus

The location of the proposed Neuroscience Institute building and the location of the proposed Castro Street/14th Street MOB were analyzed during the geotechnical investigations for the Davies Campus. The results of these geotechnical investigations are summarized below.

- **Neuroscience Institute Building Site:** The geotechnical study for the location of the proposed Neuroscience Institute building was based on previous investigations at the site, which included eight borings in the northeastern portion of the campus. The study determined that the location of the proposed building is underlain by 5–15 feet of loose to medium dense sandy fill overlying native soil consisting of medium dense to dense sand and clayey sand. Bedrock is encountered below the native soil layer at depths ranging from 43 feet below ground surface in the northern portion to 25 feet below ground surface in the southern portion.[27]

- **Castro Street/14th Street MOB Site:** The geotechnical investigation at the proposed MOB site was based on previous investigations at the site, which included seven borings in the southwest portion of the campus and

[25] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, Pacific Campus, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA, Figure 9, page 68.

[26] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, California Campus, California Pacific Medical Center, San Francisco, California*, San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, Figure 9.

[27] California Pacific Medical Center. 2006. *Geotechnical Study, Planned Medical Office Building and Retaining Wall, Davies Medical Center, San Francisco, California*. Prepared by URS, San Francisco, CA.

included an additional boring. The investigation determined that the proposed MOB site is underlain by isolated areas of 2-foot- to 14.5-foot-thick layers of fill consisting of loose sand, silty sand, and clayey sand underlain by medium-dense to very dense sand and clayey sand with occasional layers of stiff to hard sandy clay. This soil type directly underlies the surface in areas where no fill material exists (northwestern area) to depths between 32 and 61 feet below ground surface. Bedrock consisting of serpentine and shale is encountered below this layer in several locations and appears to slope down from the north to south and west to east.[28]

No groundwater was encountered in borings in the vicinity of the proposed Neuroscience Institute building; however, a design groundwater level of 32 feet below ground surface is recommended for the northern portion of the campus.[29] Groundwater has been previously measured in the vicinity of site of the proposed Castro Street/14th Street MOB at depths of 35–47 feet below ground surface, corresponding to elevations 164.5 to 157.5 feet. These measurements may not be representative of stabilized groundwater levels, given that groundwater could fluctuate several feet from previously measured values or may flow in water seeps in bedrock fractures. The geotechnical investigation recommended design groundwater levels at elevation 165 feet (35.5 feet below ground surface) at the proposed MOB location.[30]

St. Luke's Campus

A geologic hazard evaluation and geotechnical evaluation were conducted for the site of the proposed St. Luke's Replacement Hospital and a geology and geotechnical report was prepared for the location of the proposed MOB/Expansion Building, the proposed utility route, and the variant utility route. The results of these geotechnical investigations are summarized below.

- **St. Luke's Replacement Hospital Site:** Subsurface conditions were determined based on eight previous borings as well as 11 borings and 11 CPT soundings conducted in the campus area. In general, the soil underlying the site of the proposed St. Luke's Replacement Hospital consists of sandy clayey fill overlying alluvium and colluvium. Fill varies from 4.5 feet to 9 feet thick and consists of loose to medium-dense gravel and sand and medium-stiff to hard sandy clay. Fill overlies 4–5 feet of clayey and sandy topsoil 10–16 feet below ground surface in portions of the campus. The alluvium and colluvium consist of interbedded layers of very stiff to hard sandy clay and medium-dense to very dense silty sand 13 to 31.5 feet below ground surface. Alluvium and colluvium unconformably overlie Franciscan Complex shale, chert, and claystone bedrock. The

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[28] California Pacific Medical Center (Sutter Health). 2009 (March 19). *Geotechnical Investigation, Castro/14th Streets Medical Office Building and 14th/Noe Streets Temporary Parking Garage CPMC—Davies Campus, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[29] California Pacific Medical Center. 2006. *Geotechnical Study, Planned Medical Office Building and Retaining Wall, Davies Medical Center, San Francisco, California.* Prepared by URS. San Francisco, CA. Page 2-2.

[30] Ibid., page 5.

buried top of the bedrock varies from 3.5 feet below the ground surface in the northwest corner of the campus to 50 feet below ground surface at the south edge of the campus.[31]

- **MOB/Expansion Building Site:** The geology and geotechnical input at the location of the proposed MOB/Expansion Building was also based on the 19 previous borings and 11 CPT soundings described above. The location of the proposed MOB/Expansion Building is underlain by 5–10 feet of loose to medium dense gravel and sand and medium stiff to hard sandy clay. The fill is underlain by 3–4 feet of clayey and sandy soil to depths of up to 15 feet below ground surface. Beneath the soil are interbedded layers of very stiff to hard sandy clay and medium dense to very dense silty sand colluvium/alluvium to depths of 13–85 feet below ground surface, where it contacts the top of the Franciscan Complex bedrock consisting of chert, shale, and siltstone.[32]

- **Utility Route Alignment Area:** The geology and geotechnical input at the location of the proposed utility route was also based on the data from 19 previous borings and 11 CPT soundings described above for the hospital and MOB sites. The subsurface material beneath the location of the proposed utility route likely contains similar fill and colluvium/alluvium that overlie bedrock of the Franciscan Complex. In the utility route alignment area, bedrock is likely to be encountered within a few feet below ground surface in the vicinity of the intersection of 27th Street and San Jose Avenue and within 10 feet below ground surface in the vicinity of the intersection of Guerrero and Cesar Chavez Streets. The buried top of the bedrock likely continues to slope down along Cesar Chavez Street toward the east and may be encountered at 20–25 feet below ground surface in the vicinity of the intersection of Cesar Chavez Street and San Jose Avenue.[33]

- **Utility Variant Route Alignment Area:** The geology and geotechnical input at the location of the proposed utility variant route was also based on the data from 19 previous borings and 11 CPT soundings described above for the St. Luke’s Replacement Hospital and MOB/Expansion Building sites. The soil underlying Duncan Street (the location of the sewer variant) is anticipated to consist primarily of dense to very dense

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[31] Gilpin Geosciences. 2008 (December 12). *Geologic Hazard Investigation, St. Luke’s Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco. Appendix A in: California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke’s Replacement Hospital, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[32] California Pacific Medical Center (Sutter Health/CPMC). 2010 (February 26). *Geology and Geotechnical Input for Environmental Impact Report, Medical Office Building, St. Luke’s Replacement Hospital, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[33] California Pacific Medical Center (Sutter Health/CPMC). 2010 (March 12). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 1, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

sand interbedded with stiff clay. The remainder of the utilities would be relocated along the same route as the proposed project described above.[34]

Groundwater beneath the St. Luke's Campus is estimated to be at elevation 55 feet (within 14 feet of the ground surface) along the northernmost edge of campus and near elevation 61.5 feet (within 7.5 feet of the ground surface) near the center of the site, and near elevation 60 feet (within 6 feet of the ground surface) at the south end of the campus.[35, 36] In the area of the proposed entry plaza and MOB/Expansion Building, groundwater is expected to be at elevation 52–54 (within 10–13 feet of ground surface).[37] Groundwater is anticipated to be encountered at elevation 54 (15 feet below ground surface) at the termination of the proposed utility route near the intersection of Cesar Chavez Street and San Jose Avenue.[38] Groundwater is anticipated to be encountered at elevation 60 (within 6 feet below ground surface) in the location of the utility variant route along Duncan Street.[39]

Site-Specific Geologic Hazards

Potential geologic hazards are explained below followed by a detailed discussion of their potential for occurrence at each campus, as applicable. A summary table of the discussion is presented in Table 4.14-4, "Summary of Site-Specific Geologic Hazards" (page 4.14-16).

Slope Stability/Landsliding

Slope failures include many phenomena that involve the downslope displacement and movement of material, such as landslides, rockfall, debris slides, and soil creep, and can be triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Slope stability depends on several complex variables, such as the geology, structure, and amount of groundwater, as well as external processes such as climate, topography, slope geometry, and human activity. Landslides and other slope failures may occur on slopes of 15% or less; however, the probability is greater on steeper slopes that exhibit old landslide features such as scarps, slanted vegetation, and offset surfaces. Slope stability and the potential for landsliding are discussed below for each proposed or existing CPMC campus.

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[34] California Pacific Medical Center (Sutter Health/CPMC). 2010 (March 12). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 2, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[35] California Pacific Medical Center. 2008. *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, San Francisco, California*. San Francisco, CA.

[36] Gilpin Geosciences. 2008 (December 12). *Geologic Hazard Investigation, St. Luke's Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco. Appendix A in: California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[37] California Pacific Medical Center (Sutter Health/CPMC). 2010 (February 26). *Geology and Geotechnical Input for Environmental Impact Report, Medical Office Building, St. Luke's Replacement Hospital, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[38] Ibid.

[39] Ibid.

Table 4.14-4
Summary of Site-Specific Geologic Hazards

Campus	Landsliding Susceptibility	Subsidence	Expansion Potential	Corrosivity	Collapse	Erosion Potential
Cathedral Hill	Not susceptible	Not susceptible	Low	Moderately to mildly corrosive	Not susceptible	Low
Pacific	Not susceptible	Not susceptible	Low	Moderately to negligibly corrosive	Not susceptible	Low
California	Not susceptible	Susceptible in upper fill layers	Moderately expansive in weathered bedrock	Corrosive to mildly corrosive	Not susceptible	Low
Davies	Not susceptible	Not susceptible	Low	NA	Not susceptible	Low
St. Luke’s	Not susceptible	Not susceptible	Low	Moderately to mildly corrosive	Susceptible with low potential	Low

Note: NA = data not available

Sources:

Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

California Pacific Medical Center. 2005 (April 4). *Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 9.

California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, Pacific Campus, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

California Pacific Medical Center. 2006. *Geotechnical Study, Planned Medical Office Building and Retaining Wall, Davies Medical Center, San Francisco, California.* San Francisco, CA. Prepared by URS, San Francisco, CA.

California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke’s Replacement Hospital, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

California Pacific Medical Center. 2009 (March 24). *Geotechnical Consultation, California Pacific Medical Center (CPMC)—Cathedral Hill Campus, Van Ness Avenue Connector Tunnel,* San Francisco, California. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

California Pacific Medical Center (Sutter Health). 2009 (March 19). *Geotechnical Investigation, Castro/14th Streets Medical Office Building and 14th/Noe Streets Temporary Parking Garage CPMC—Davies Campus, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

California Pacific Medical Center (Sutter Health/CPMC). 2010 (February 26). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 1, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

California Pacific Medical Center (Sutter Health/CPMC). 2010 (March 15). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 2, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

- **Cathedral Hill Campus:** The entire site of the proposed Cathedral Hill Hospital is located on steeply sloping land. The highest part of the site is located along Franklin Street and the lowest part is located along Van Ness Avenue. The steepest slope is located along Post Street at approximately 12:1 (horizontal: vertical).[40] In general, the slope of the site is slightly greater to the west of Van Ness Avenue than that of the area to the east of Van Ness Avenue. The site of the proposed Cathedral Hill MOB, east of Van Ness Avenue, slopes toward the southeast, with the highest part of the site located along Van Ness Avenue and the lowest part at its easternmost side. The elevations of the MOB site range from 145 feet in the northwest corner to 120 feet at the southeast corner.[41] The location of the proposed Van Ness Avenue pedestrian tunnel is relatively flat; it has an elevation of approximately 144 feet at the connection with the site of the proposed hospital on the west side and 141 feet at the connection with the site of the proposed MOB on the east side.[42]

  The proposed Cathedral Hill Campus is not located within an area susceptible to potential landslide hazards as mapped by the *San Francisco General Plan*.[43] Additionally, the State of California's seismic hazards zone map indicates that the proposed campus is not located within an area where previous occurrences of landslide movement or local topographic, geological, geotechnical, and subsurface water conditions indicate a potential for landslides.[44] No landslides have been mapped on or near the proposed Cathedral Hill Campus and the geotechnical investigations determined that the site geologic material is not susceptible to landsliding.[45]

- **Pacific Campus:** The Pacific Campus is located on a hillside with elevations steeply sloping toward the west downward from 285 feet at the east side (along Buchanan Street) to 205 feet at the west side (between Webster and Fillmore Streets). Both the site of the proposed North-of-Clay Aboveground Parking Garage (occupied by the Annex MOB and Gerbode Research Building) and site of the proposed ACC Addition (occupied at present by the Stanford Building and 2324 Sacramento Street Clinic) are located on steep slopes.

[40] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[41] California Pacific Medical Center (Sutter Health/CPMC). 2009 (October 2). *Updated Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 6.

[42] California Pacific Medical Center. 2009 (March 24). *Geotechnical Consultation, California Pacific Medical Center (CPMC)—Cathedral Hill Campus, Van Ness Avenue Connector Tunnel, San Francisco, California*, San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[43] City and County of San Francisco. 1997. Community Safety Element in the *San Francisco General Plan*, Map 5, "Areas Susceptible to Landslide." San Francisco, CA.

[44] California Geological Survey. 2000. State of California Seismic Hazard Zones, City and County of San Francisco Official Map. Sacramento, CA.

[45] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

The Pacific Campus is not located within an area susceptible to potential landslide hazards as mapped by the *San Francisco General Plan*.[46] Additionally, the State of California's seismic hazards zone map indicates that the campus is not located within an area where previous occurrences of landslide movement or local topographic, geological, geotechnical, and subsurface water conditions indicate a potential for landslides.[47]

- **California Campus:** The California Campus is located on a hillside that slopes steeply downward to the south and gradually downward to the west. Elevations range from about 254 feet at the northeast corner of the campus to 210 feet at the southwest corner. The California Campus is not located within an area susceptible to potential landslide hazards as mapped by the *San Francisco General Plan*.[48] Additionally, the State of California's seismic hazards zone map indicates that the campus is not located within an area where previous occurrence of landslide movement or local topographic, geological, geotechnical, and subsurface water conditions indicate a potential for landslides.[49]

- **Davies Campus:** The ground surface at the Davies Campus slopes toward the east from an elevation of 227 feet at the intersection of Castro Street and 14th Street down to an approximate elevation of 148 feet at the intersection of Noe Street and 14th Street, and to 155 feet at the intersection of Noe Street and Duboce Avenue. The ground surface also slopes down toward the north along the western perimeter of the campus along Castro Street from 227 feet at the intersection of Castro and 14th Streets to an elevation of 214 feet at the intersection of Castro Street and Duboce Avenue. The site of the proposed Castro Street/14th Street MOB (occupied mostly by the existing parking garage) is entirely on a steeply sloping part of the site. The proposed Neuroscience Institute building site (currently occupied by a surface parking lot) is flat to gently sloping.

  The Davies Campus is not located within an area susceptible to potential landslide hazards as mapped by the *San Francisco General Plan*.[50] Additionally, the State of California's seismic hazards zone map indicates that the campus is not located within an area where previous occurrence of landslide movement or local topographic, geological, geotechnical, and subsurface water conditions indicate a potential for landslides.[51]

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[46] City and County of San Francisco. 1997. Community Safety Element in the *San Francisco General Plan*. Map 5, "Areas Susceptible to Landslide." San Francisco, CA.

[47] California Geological Survey. 2000. State of California Seismic Hazard Zones, City and County of San Francisco Official Map. Sacramento, CA.

[48] City and County of San Francisco. 1997. Community Safety Element in the *San Francisco General Plan*. Map 5, "Areas Susceptible to Landslide." San Francisco, CA.

[49] California Geological Survey. 2000. State of California Seismic Hazard Zones, City and County of San Francisco Official Map. Sacramento, CA.

[50] City and County of San Francisco. 1997. Community Safety Element in the *San Francisco General Plan*. Map 5, "Areas Susceptible to Landslide." San Francisco, CA.

[51] California Geological Survey. 2000. State of California Seismic Hazard Zones, City and County of San Francisco Official Map. Sacramento, CA.

- **St. Luke's Campus:** The northern half of the St. Luke's Campus slopes very gently downward from west to east near Guerrero Street toward San Jose Avenue and Valencia Street and slopes very gently downward to the north from 27th Street to Cesar Chavez Street. The site between Guerrero Street (west) and Valencia Street (east) has an approximately 7-foot change in grade and an approximately 9-foot change in grade between 27th Street (south) and Cesar Chavez Street (north). The sites of the proposed St. Luke's Replacement Hospital (currently occupied by a parking lot) and adjacent MOB/Expansion Building (currently occupied by the St. Luke's Hospital tower and drop-off parking area) are flat to very gently sloping. A substantial increase in slope is present in the area off-campus to the immediate west of Guerrero Street.

  The St. Luke's Campus is located within an area susceptible to potential landslide hazards as mapped by the *San Francisco General Plan*.[52] However, the State of California's seismic hazards zone map indicates that the campus is not located within an area where previous occurrence of landslide movement or local topographic, geological, geotechnical, and subsurface water conditions indicate a potential for landslides.[53] Additionally, no evidence of past or ongoing landslide activity was observed during review of aerial photographs and site reconnaissance.[54]

Land Subsidence

Land subsidence is the loss of surface elevation caused by the removal of subsurface support. Land subsidence is typically caused by compression of soft, geologically young sediments or activities related to fluid extraction (e.g., groundwater or petroleum), such as overdraft of an aquifer for agriculture or municipal uses. San Francisco lacks commercial agricultural land uses that use groundwater. The City and County of San Francisco (City) pumps groundwater from within the city limits for landscape irrigation at the Harding Park Golf Course, San Francisco Zoo, and Golden Gate Park. The City's proposed Groundwater Supply Project includes plans for six new wells in the western part of the city to operate in 2013, with total pumping of up 4 million gallons per day. No petroleum wells that might cause subsidence exist within the city limits.

The geotechnical investigations conducted for the proposed and existing CPMC campuses found that the respective campus sites exhibit the following characteristics regarding the potential for subsidence:

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[52] City and County of San Francisco. 1997. Community Safety Element in the *San Francisco General Plan*. Map 5, "Areas Susceptible to Landslide." San Francisco, CA.

[53] California Geological Survey. 2000. State of California Seismic Hazard Zones, City and County of San Francisco Official Map. Sacramento, CA.

[54] Gilpin Geosciences. 2008 (December 12). *Geologic Hazard Investigation, St. Luke's Medical Center, San Francisco, California*. San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco. Appendix A in: California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

- **Cathedral Hill Campus:** Subsurface exploration at the proposed campus determined that the site is underlain primarily by dense to very dense sands and stiff clays, and no soft compressible sediment that would be susceptible to subsidence was encountered.[55, 56, 57]

- **Pacific Campus:** This campus was determined to be underlain primarily by dense to very dense sand with minor amounts of stiff to very stiff clay, and no soft compressible sediment that would be susceptible to subsidence was encountered.[58]

- **California Campus:** This campus was determined to be underlain primarily by medium-dense to very dense sand and medium-stiff to hard clay. Soft compressible sediment that would be susceptible to subsidence was encountered in the upper fill layers; however, sediment density increases with depth and nonfill sediment would not be susceptible to subsidence.[59]

- **Davies Campus:** This campus was determined to be underlain primarily by medium-dense to very dense sand with minor amounts of stiff to hard clay, and no soft compressible sediment that would be susceptible to subsidence was encountered.[60]

- **St. Luke's Campus**: This campus was determined to be underlain primarily by medium-dense to very dense silty sand and very stiff to hard sandy clay, and no soft compressible sediment that would be susceptible to subsidence was encountered.[61]

Expansive and Corrosive Soils

Problematic (corrosive and expansive) soils and corrosive saline groundwater can damage structures, foundations, and buried utilities and can also increase required maintenance. Depending on the degree of corrosivity of

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[55] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[56] California Pacific Medical Center (Sutter Health/CPMC). 2009 (October 2). *Updated Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[57] California Pacific Medical Center. 2009 (March 24). *Geotechnical Consultation, California Pacific Medical Center (CPMC)—Cathedral Hill Campus, Van Ness Avenue Connector Tunnel, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[58] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, Pacific Campus, California Pacific Medical Center, San Francisco, California*, San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[59] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, California Campus, California Pacific Medical Center, San Francisco, California*, San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[60] California Pacific Medical Center (Sutter Health). 2009 (March 19). *Geotechnical Investigation, Castro/14th Streets Medical Office Building and 14th/Noe Streets Temporary Parking Garage CPMC—Davies Campus, San Francisco, California*, San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[61] Gilpin Geosciences. 2008 (December 12). *Geologic Hazard Investigation, St. Luke's Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco. Appendix A in: California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

subsurface soils, concrete and reinforcing steel in concrete structures and bare metal structures exposed to these soils can deteriorate, eventually leading to structural failure. Expansive soils are those that shrink or swell substantially with changes in moisture content and generally contain a high percentage of clay particles. Sandy soils are not expansive. Expansive soils in arid and semiarid regions are subject to more extreme cycles of expansion and contraction than those in more consistently moist areas. Expansion and contraction of expansive soils in response to changes in moisture content can cause differential and cyclical movements that can damage and/or distress structures and equipment.

San Francisco is mapped within an area where less than 50% of the soil consists of clay having high swelling potential.[62]

The geotechnical investigations conducted for the proposed and existing CPMC campuses found that the respective campus sites exhibit the following characteristics regarding the potential for expansive and corrosive soils:

- **Cathedral Hill Campus:** Laboratory testing was conducted to calculate the plasticity indices and liquid limits of the soil beneath the location of the proposed Cathedral Hill Hospital and Cathedral Hill MOB. The tests determined that the plasticity index[63] and liquid limits of the soil were low, indicating a low probability of sediment expansion beneath the site. Laboratory corrosion testing and a corrosivity evaluation were also conducted on the soils at the site. Results indicated that deeper soils are considered "moderately corrosive" while upper surface soils are considered "mildly corrosive."[64, 65] Laboratory testing was not conducted to determine the plasticity indices and liquid limits of the soil at the location of the proposed Van Ness Avenue pedestrian tunnel; however, they are assumed to be similar to those at the sites of the proposed hospital and MOB.

- **Pacific Campus:** This campus is underlain primarily by sand, which is not expansive, and only minor amounts of sandy clay are present. As such, the expansion potential of the sediment at the site is considered low. Laboratory corrosion testing and a corrosivity evaluation were also conducted on the soils at the campus.

[62] Olive, W. W., A. F. Chleborad, C. W. Frahme, J. Schlocker, R. R. Schneider, and R. L. Shuster. 1989. Swelling Clays Map of the Conterminous United States, Soils of California. U.S. Geological Survey. Washington, DC.

[63] The plasticity index is the measure of the plasticity of soils; soils with a high plastic index tend to be clays, which can exhibit high expansive properties while soils with a lower plasticity index tend to be silts, which can exhibit moderate expansive properties, and soils with a 0 plastic index have no silts or clay.

[64] California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[65] California Pacific Medical Center (Sutter Health/CPMC). 2009. *Updated Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

Results indicated that soils at the Pacific Campus are considered “moderately corrosive” to “negligibly corrosive.”[66]

- **California Campus:** This campus is underlain primarily by sand (not expansive); however, thick layers of clay are present within the Colma Formation and upper layers of the Franciscan bedrock have weathered to clay. These clay layers were determined to be moderately expansive.[67] Laboratory corrosion testing and a corrosivity evaluation were also conducted on the soils at the campus. Results indicated that soils at the California Campus are considered “corrosive” to “mildly corrosive.”[68]

- **Davies Campus:** This campus is underlain primarily by sand (not expansive) and only minor amounts of sandy clay.[69] As such, the expansion potential of the sediment at the campus is considered low. No laboratory corrosion testing was conducted for the Davies Campus. No data are available regarding corrosivity of soil at the Davies Campus.

- **St. Luke’s Campus:** This campus is underlain primarily by sand (not expansive), and only minor amounts of sandy clay exist. As such, the expansion potential of the sediment at the campus is considered low. Laboratory corrosion testing and a corrosivity evaluation were conducted on the soils at the site. Results indicated that soils at the St. Luke’s Campus are considered “moderately corrosive” to “mildly corrosive.”[70]

Soil Collapse

Soil collapse occurs when sediment moisture content increases substantially, leading to the densification of the soil, which can lead to structural damage from cracking foundations, walls, and floors. Typical causes of soil collapse include infiltration resulting from poor surface drainage, irrigation water, or leaking pipes into low-density, silty sandy soil in semiarid and arid climates that are not regularly subjected to saturation.[71]

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[66] California Pacific Medical Center. 2006. *Geotechnical Investigation, Four Campus Master Plan Project, Pacific Campus, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[67] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, California Campus, California Pacific Medical Center, San Francisco, California*, San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, Page 14.

[68] Ibid, page 26.

[69] California Pacific Medical Center (Sutter Health). 2009. *Geotechnical Investigation, Castro/14th Streets Medical Office Building and 14th/Noe Streets Temporary Parking Garage CPMC—Davies Campus, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[70] Gilpin Geosciences. 2008 (December 12). *Geologic Hazard Investigation, St. Luke’s Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco. Appendix A in: California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke’s Replacement Hospital, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[71] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

The geotechnical investigations for the proposed and existing CPMC campuses found that underlying soils exhibit the following characteristics regarding the potential for soil collapse:

- **Cathedral Hill Campus:** The soil was determined to be primarily medium dense to very dense.[72, 73, 74] The relative densities of the soil at the sites of the proposed Cathedral Hill Hospital and Cathedral Hill MOB do not indicate a susceptibility to collapse. Accordingly, the potential for soil collapse at the campus is low. [75]

- **Pacific Campus:** The soil was determined to be dense to very dense, which does not indicate a susceptibility to collapse.[76] Accordingly, the potential for soil collapse at this campus is low.

- **California Campus:** The soil was determined to be primarily medium-dense to very dense sand and medium-stiff to hard clay, which does not indicate a susceptibility to collapse.[77] Accordingly, the potential for soil collapse at this campus is low.

- **Davies Campus:** The soil was determined to be medium dense to very dense, which does not indicate a susceptibility to collapse.[78] Accordingly, the potential for soil collapse at this campus is low.

- **St. Luke's Campus:** The loose, sandy soil within some of the artificial fill at this campus would be susceptible to collapse. However, the geologic hazard evaluation and geotechnical evaluation for the St. Luke's Campus determined that based on the abundance of clay within the fill, the potential for soil collapse at this campus is low.[79]

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[72] Ibid.

[73] California Pacific Medical Center (Sutter Health/CPMC). 2009. *Updated Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[74] California Pacific Medical Center. 2009. *Geotechnical Consultation, California Pacific Medical Center (CPMC)—Cathedral Hill Campus, Van Ness Avenue Connector Tunnel, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[75] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[76] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, Pacific Campus, California Pacific Medical Center, San Francisco, California*, San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[77] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, California Campus, California Pacific Medical Center, San Francisco, California*, San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 11.

[78] California Pacific Medical Center (Sutter Health). 2009 (March 19). *Geotechnical Investigation, Castro/14th Streets Medical Office Building and 14th/Noe Streets Temporary Parking Garage CPMC—Davies Campus, San Francisco, California*, San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[79] Gilpin Geosciences. 2008 (December 12). *Geologic Hazard Investigation, St. Luke's Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco. Appendix A in: California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

Erosion

Construction activities such as grading and excavation can remove stabilizing vegetation and expose areas of loose soil that, if not properly stabilized, can be subject to soil loss and erosion by wind and stormwater runoff. Newly constructed and compacted engineered slopes can also undergo substantial erosion through dispersed sheet flow runoff, and more concentrated runoff can form erosion channels and larger gullies, each compromising the integrity of the slope and resulting in substantial soil loss.

The geotechnical investigations for the proposed and existing CPMC campuses found that the campus sites exhibit the following characteristics regarding the potential for erosion:

- **Cathedral Hill Campus:** This proposed campus is almost entirely paved or developed with buildings. No evidence of localized erosion was observed on-site at any of these campuses and future erosion potential was determined to be low.[80]

- **Pacific Campus:** This campus is almost entirely paved or developed with buildings. No evidence of localized erosion was observed on-site at any of these campuses and future erosion potential was determined to be low.[81]

- **California Campus:** This campus is almost entirely paved or developed with buildings. No evidence of localized erosion was observed on-site at any of these campuses and future erosion potential was determined to be low.[82]

- **Davies Campus:** This campus has substantial soil coverage by paving and developed with buildings. Open areas are fully landscaped and managed. No evidence of localized erosion was observed on-site and future erosion potential was determined to be low.

- **St. Luke's Campus:** This campus is almost entirely paved or developed with buildings. No evidence of localized erosion was observed on-site and future erosion potential was determined to be low.[83]

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[80] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[81] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, Pacific Campus, California Pacific Medical Center, San Francisco, California*, San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[82] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, California Campus, California Pacific Medical* Center, San Francisco, California, San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco,

[83] Gilpin Geosciences. 2008 (December 12). *Geologic Hazard Investigation, St. Luke's Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco. Page 12 of Appendix A in: California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

SITE-SPECIFIC SEISMIC HAZARDS

Potential seismic hazards are explained below followed by a detailed discussion of their potential for occurrence at each campus, as applicable. A summary table of the discussion is presented in Table 4.14-5, "Summary of Site-Specific Seismic Hazards."

Table 4.14-5
Summary of Site-Specific Seismic Hazards Related to Soil and Groundwater Conditions

Campus	Liquefaction Potential	Lateral Spreading Potential	Seismic Settlement (including liquefaction and differential compaction) (inches)
Cathedral Hill			
Cathedral Hill Hospital	Susceptible	Low	0.25–3
Cathedral Hill MOB	Low	Low	1–3
Van Ness Avenue pedestrian tunnel	Low	Low	1–2
Pacific	Low	Low	0.25–0.75
California	Low	Low	0.25–1.5
Davies	Low	Low	0.25–1
St. Luke's			
St. Luke's Replacement Hospital	Low	Low	None
MOB/Expansion Building	Low	Low	None
Area adjacent to MOB/Expansion Building	Susceptible	Susceptible	1–1.5
Utility route	Susceptible	Susceptible	1–2
Sewer variant	Low	Low	None

Note: MOB = Medical Office Building

Sources:

Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

California Pacific Medical Center. 2005 (April 4). *Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 9.

California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, Pacific Campus, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

California Pacific Medical Center. 2006. *Geotechnical Study, Planned Medical Office Building and Retaining Wall, Davies Medical Center, San Francisco, California.* San Francisco, CA. Prepared by URS, San Francisco, CA.

California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

California Pacific Medical Center. 2009 (March 24). *Geotechnical Consultation, California Pacific Medical Center (CPMC)—Cathedral Hill Campus, Van Ness Avenue Connector Tunnel,* San Francisco, California. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

California Pacific Medical Center (Sutter Health). 2009 (March 19). *Geotechnical Investigation, Castro/14th Streets Medical Office Building and 14th/Noe Streets Temporary Parking Garage CPMC—Davies Campus, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

California Pacific Medical Center (Sutter Health/CPMC). 2010 (February 26). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 1, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

California Pacific Medical Center (Sutter Health/CPMC). 2010 (March 15). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 2, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

Liquefaction

Liquefaction is a phenomenon in which saturated granular, nonplastic sediments temporarily lose their shear strength during periods of strong ground shaking, such as that which occurs during earthquakes. Seismic waves traveling through soils can cause deformations that collapse the loose granular structure. Secondary effects associated with liquefaction include flow failures, which occur when liquefied soil moves down a steep slope with large displacement and internal disruption of material. Soil may also lose its ability to support structures, and this loss of bearing strength may cause structures founded on the liquefied materials to tilt or possibly topple over. Severe liquefaction during the 1906 San Francisco Earthquake and the 1989 Loma Prieta Earthquake resulted in some of the most severe damage to structures in the region, e.g., collapse of buildings in the South of Market neighborhood in 1906 and in the Marina District in 1989.

Lightweight structures such as pipelines, sewers, and empty fuel tanks that are buried in the ground can rise (“float”) to the surface when they are surrounded by liquefied soil. The susceptibility of a site to liquefaction is a function of the uniformity, depth, relative density, and water content of the granular sediments beneath the site and the magnitude of earthquakes likely to affect the site. The vast majority of liquefaction hazards are associated with sandy soils and silty soils of low plasticity. Cohesive soils of low plasticity generally are not considered susceptible to soil liquefaction. In addition to sandy and silty soils, gravelly soils with poor drainage are potentially vulnerable to liquefaction. In general, liquefaction hazards are most severe in the first 50 feet below the ground surface. On a free-face slope or where foundations go beyond 50 feet below ground surface, the liquefaction potential of deeper materials should be evaluated. There are two general levels of liquefaction hazards: (1) large-scale displacement and (2) localized failures—lateral spreading, vertical settlement from densification, sand boils, ground oscillation, flow failures, loss of bearing strength, and buoyancy effects. Liquefaction potential is discussed below for the site of each proposed or existing CPMC campus.

- **Cathedral Hill Campus:** The sites of the proposed Cathedral Hill Hospital, Cathedral Hill MOB, and Van Ness Avenue pedestrian tunnel are not located within a liquefaction hazard zone as established by the California Geological Survey (CGS),[84] but are located within an area that has “moderate” susceptibility to liquefaction as mapped by a large-scale regional map of the San Francisco Bay Area by USGS.[85] The soils beneath the groundwater table at the sites consist of dense to very dense sand and clayey and silty sand, which

[84] California Geological Survey. 2000. State of California Seismic Hazard Zones, City and County of San Francisco, Official Map. Sacramento, CA.

[85] Knudsen, K. L., J. M. Sowers, R. C. Witter, C. M. Wentworth, and E. J. Helley. 2000. *Preliminary Maps of Quaternary Deposits and Liquefaction Susceptibility, Nine-County San Francisco Bay Region, California.* U.S. Geological Survey Open-File Report 00-444, scale 1:275,000. U.S. Geological Survey. Washington, DC.

are not susceptible to liquefaction.[86, 87] However, a 2-foot-thick, medium-dense, clayey isolated sand lens encountered in one boring in the northeastern portion of the proposed hospital site would potentially be liquefiable with an estimated settlement of one-quarter to one-half inch.[88]

- **Pacific and California Campuses:** The Pacific and California Campuses are not located within a liquefaction hazard zone as established by CGS.[89] Additionally, the soils beneath the groundwater table underlying these campuses generally consist of dense sand and clayey sand, which would not be susceptible to liquefaction.[90, 91]

- **Davies Campus:** The Davies Campus is not located within a liquefaction hazard zone as established by CGS.[92] Additionally, the soils beneath the groundwater table generally consist of medium-dense to dense sand and stiff to hard clay, which would not be susceptible to liquefaction.[93]

- **St. Luke's Campus:** The St. Luke's Campus is not located within a liquefaction hazard zone as established by CGS.[94] Additionally, the soil beneath the groundwater table in the northwest portion of the campus, in the area of the proposed St. Luke's Replacement Hospital, generally consists of dense to very dense sand, which would not be susceptible to liquefaction.[95] However, the sediment beneath the surface of the northeast portion of the campus, in the pavement area adjacent to the site of the proposed MOB/Expansion Building, consists of medium-dense clayey and silty sand, which is potentially liquefiable. An engineering analysis was conducted on the loose to medium-dense material to evaluate the liquefaction potential. The results indicate that the soil

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[86] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[87] California Pacific Medical Center (Sutter Health/CPMC). 2009 (October 2). *Updated Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[88] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[89] California Geological Survey. 2000. State of California, Seismic Hazard Zones, City and County of San Francisco, Official Map. Sacramento, CA.

[90] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, Pacific Campus, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[91] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, California Campus, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[92] California Geological Survey. 2000. State of California Seismic Hazard Zones, City and County of San Francisco, Official Map. Sacramento, CA.

[93] California Pacific Medical Center (Sutter Health). 2009 (March 19). *Geotechnical Investigation, Castro/14th Streets Medical Office Building and 14th/Noe Streets Temporary Parking Garage CPMC—Davies Campus, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[94] California Geological Survey. 2000. State of California Seismic Hazard Zones, City and County of San Francisco, Official Map. Sacramento, CA.

[95] California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

from 4 to 9.5 feet deep in the existing utility equipment area (proposed entry plaza area) and 4–16 feet deep beneath the existing hospital tower (the site of the proposed MOB/Expansion Building) is liquefiable. The thickness of the potentially liquefiable soil increases toward the northeast half of the existing St. Luke's Hospital tower (maximum depth of 16 feet at the northeast corner of the building) and decreases to 4 and 8 feet, respectively, at the northeast corner of the building and the southeast corner of the parking lot immediately north (fronting Cesar Chavez Street). It was determined that this soil layer could result in liquefaction-induced ground settlement on the order of one-quarter inch to 2 inches during a major earthquake on a nearby fault.[96] Because potentially liquefiable soil is present in the area adjacent to the site of the proposed MOB/Expansion Building, it may also occur beneath the northeasternmost section of the proposed sewer relocation route (at the intersection of Cesar Chavez Street and San Jose Avenue). The geology and geotechnical input determined that potentially liquefiable soil in this area is likely less than 5 feet thick and could result in liquefaction-induced ground settlement on the order of 2–3 inches during an earthquake on a major nearby major fault.[97] The liquefaction potential of the subsurface materials at the location of the sewer variant (along Duncan Street) is low.[98]

Lateral Spreading

Of the liquefaction hazards, lateral spreading generally causes the most damage. Lateral spreading occurs when a layer liquefies at depth and causes the overlying nonliquefied soil to displace and move downslope. The mass moves toward an unconfined area, such as a stream bank, excavation, or open body of water, and can occur on slope gradients as gentle as 1 degree.[99] Lateral-spreading potential is discussed below for the site of each proposed or existing CPMC campus.

- **Cathedral Hill Campus:** No exposed faces of soil, bodies of water, or open excavations toward which soil mass at the site could migrate are located on or adjacent to the proposed Cathedral Hill Campus. The geotechnical investigation determined that because no continuous potentially liquefiable layers were observed

[96] Ibid.

[97] California Pacific Medical Center (Sutter Health/CPMC). 2010 (February 26). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 1, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. p.4.

[98] California Pacific Medical Center (Sutter Health/CPMC). 2010 (February 26). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 2, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. p. 4.

[99] California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

at the sites of the proposed Cathedral Hill Hospital and Cathedral Hill MOB, the existing potential for lateral spreading is low. [100, 101, 102]

- **Pacific, California, and Davies Campuses:** The geotechnical investigations for the Pacific, California, and Davies Campuses determined that the sediment beneath these respective campuses is not susceptible to liquefaction, and accordingly, the potential for associated lateral spreading is also low.[103, 104, 105]

- **St. Luke's Campus:** The geotechnical evaluation of the St. Luke's Campus determined that the sediment beneath the area of the proposed replacement hospital is not susceptible to liquefaction, and accordingly, the potential for associated lateral spreading is also low.[106] However, the engineering analysis determined that the sediment beneath the water table in the area adjacent to the site of the proposed MOB/Expansion Building and the northeasternmost section of the proposed utility route (at the intersection of Cesar Chavez Street and San Jose Avenue) is liquefiable. Based on subsurface explorations, the potentially liquefiable area is confined within a previous creek bank and the potential for lateral spreading would be limited to the northeast corner of the campus.[107] The sediment beneath the location of the proposed sewer variant (Duncan Street) is not susceptible to liquefaction, and accordingly, the potential for associated lateral spreading is also low.[108]

Earthquake-Induced Settlement/Differential Compaction

Settlement, or differential compaction, of the ground surface can be accelerated and accentuated by earthquakes. During an earthquake, settlement can occur as a result of the relatively rapid rearrangement, compaction, and settling of subsurface materials (particularly loose, uncompacted, and variable sandy sediments). Settlement can occur both uniformly and differentially (i.e., where adjoining areas settle at different rates). The potential for

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[100] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[101] California Pacific Medical Center. 2005 (April 4). *Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[102] California Pacific Medical Center. 2009 (March 24). *Geotechnical Consultation, California Pacific Medical Center (CPMC)—Cathedral Hill Campus, Van Ness Avenue Connector Tunnel, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[103] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, Pacific Campus, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[104] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, California Campus, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[105] California Pacific Medical Center (Sutter Health). 2009 (March 19). *Geotechnical Investigation, Castro/14th Streets Medical Office Building and 14th/Noe Streets Temporary Parking Garage CPMC—Davies Campus, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[106] California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[107] Ibid.

[108] California Pacific Medical Center (Sutter Health/CPMC). 2010 (February 26). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 2, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 4.

earthquake-induced settlement at the CPMC campuses, as determined by the respective geotechnical investigations for the campus sites, is discussed below.

- **Cathedral Hill Campus:** Zones of loose to medium-dense sand were encountered within the fill and the upper layers of the dune sand. The analysis calculated the settlement potential of the ground adjacent to the proposed building (streets, sidewalks, and landscaping areas) to be 1–3 inches at the sites of the proposed Cathedral Campus Hospital and Cathedral Hill MOB.[109, 110] Settlement on the ground surface in the footprint of the Van Ness Avenue pedestrian tunnel is estimated to range between 1 and 2 inches.[111]

- **Pacific Campus:** In general, the sandy soil above the groundwater table is sufficiently dense and/or cohesive and the potential for densification is low. However, zones of loose to medium-dense sand were encountered within the fill and the upper layers of the dune sand. The analysis calculated the settlement potential of the ground adjacent to the proposed buildings (streets, sidewalks, and landscaping areas) to be one-quarter to three-quarter inch.[112]

- **California Campus:** Zones of loose to medium-dense sand were encountered within the fill and dune sand beneath the California Campus. An engineering analysis concluded that the fill and dune sand could settle up to 1.5 inches.[113]

- **Davies Campus:** Loose, sandy fill was encountered above the groundwater table throughout the Davies Campus. This soil could densify and settle during an earthquake and the geotechnical investigation estimated the amount of settlement to be between one-quarter inch and 1 inch.[114]

- **St. Luke's Campus:** The subsurface materials in the vicinity of the proposed St. Luke's Replacement Hospital are generally too clayey and dense for seismic settlement to occur.[115] However, subsurface

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[109] Gilpin Geosciences, Inc. 2004 (September 28). *Geologic Hazard Investigation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco, CA. Appendix A in: California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[110] California Pacific Medical Center. 2005 (April 4). *Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[111] California Pacific Medical Center. 2009 (March 24). *Geotechnical Consultation, California Pacific Medical Center (CPMC)—Cathedral Hill Campus, Van Ness Avenue Connector Tunnel, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[112] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, Pacific Campus, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[113] California Pacific Medical Center. 2006 (March 28). *Geotechnical Investigation, Four Campus Master Plan Project, California Campus, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[114] California Pacific Medical Center (Sutter Health). 2009 (March 19). *Geotechnical Investigation, Castro/14th Streets Medical Office Building and 14th/Noe Streets Temporary Parking Garage CPMC—Davies Campus, San Francisco, California*, San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[115] Gilpin Geosciences. 2008 (December 12). *Geologic Hazard Investigation, St. Luke's Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco. Appendix A in: California Pacific Medical Center (Sutter Health FPD). 2008 (December

exploration identified medium-dense sand above the design groundwater level, which would be susceptible to seismic settlement in the sidewalks and pavement area adjacent to the site of the proposed MOB/Expansion Building. Engineering analysis conducted on this sediment determined that the estimated differential earthquake-induced settlement would be on the order of 1 inch to 1.5 inches over a horizontal distance of 30 feet, resulting in one-quarter inch of local densification settlement at the ground surface; however, the sediment beneath the site of the proposed MOB/Expansion Building would not be susceptible to settlement.[116] Anticipated settlement in the vicinity of the northeasternmost section of the proposed utility route (at the intersection of Cesar Chavez and San Jose Avenue) would be on the order of 1–2 inches over a horizontal distance of 50 feet.[117] The seismic settlement potential of the subsurface materials at the site of the sewer variant route (along Duncan Street) was determined to be low.[118]

4.14.2 Regulatory Framework

Federal

Executive Order 12699

Executive Order 12699, "Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction," was signed by President George H. W. Bush on January 5, 1990, to further the goals of Public Law 95-124, the Earthquake Hazards Reduction Act of 1977, as amended. The executive order applies to new construction of buildings owned, leased, constructed, assisted, or regulated by the federal government. Guidelines and procedures for implementing the order were prepared in 1992 by the federal Interagency Committee on Seismic Safety in Construction. The guidelines establish minimum acceptable seismic safety standards, provide evaluation procedures for determining the adequacy of local building codes, and recommend implementation procedures. Each federal agency is independently responsible for ensuring that appropriate seismic design and construction standards are applied to new construction under its jurisdiction.

Under the original Executive Order 12699, the model code for the West Coast was the Uniform Building Code developed by the International Conference of Building Officials. In 1994, the International Conference of Building Officials joined with other similar organizations in the Southeast and on the East Coast to form the International Code Council (ICC). In 2000, the ICC published the first International Building Code (IBC) based

19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[116] California Pacific Medical Center. 2010 (February 26). *Geology and Geotechnical Input for Environmental Impact Report, Medical Office Building, St. Luke's Replacement Hospital, San Francisco, California*. Prepared by Treadwell & Rollo, San Francisco, CA.

[117] California Pacific Medical Center (Sutter Health/CPMC). 2010 (February 26). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 1, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[118] California Pacific Medical Center (Sutter Health/CPMC). 2010 (March 15). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 2, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

on the reassessment of earlier codes and the combined updated experience of ICC member organizations. The current 2006 IBC is the result of nearly 100 years of building code improvement and forms the basis of the CBC and SFBC (discussed below), which are successively more stringent than the codes in force at the time of the implementation of the original federal guidelines.

STATE

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) was passed in December 1972 to mitigate the hazard of surface faulting to structures for human occupancy. Surface rupture is the most easily avoided seismic hazard. The Alquist-Priolo Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Alquist-Priolo Act addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards. The Seismic Hazards Mapping Act, passed in 1990, addresses earthquake hazards caused by nonsurface fault rupture, including liquefaction and seismically induced landslides. The law requires the State Geologist to establish regulatory zones, known as earthquake fault zones, around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning and controlling new or renewed construction. Local agencies must regulate most development projects within the zones. Projects include all land divisions and most structures for human occupancy. Before a project can be permitted, cities and counties must require a geologic investigation to demonstrate that proposed buildings will not be constructed across active faults. An evaluation and written report of a specific site must be prepared by a licensed geologist. If an active fault is found, a structure for human occupancy cannot be placed over the trace of the fault and must be set back 50 feet from the fault trace. Because no active fault zones are known to exist in San Francisco, no earthquake fault zones under the Alquist-Priolo Act are mapped in the city.

Seismic Hazards Mapping Act

The state regulations protecting the public from geoseismic hazards other than surface faulting are contained in Division 2, Chapter 7.8 of the California Public Resources Code (the Seismic Hazards Mapping Act), described here, and in Title 24, Part 2 of the 2007 California Code of Regulations (CCR) (the CBC), described below. Both of these regulations apply to public buildings, and a large percentage of private buildings, intended for human occupancy.

The Seismic Hazards Mapping Act was passed in 1990 following the Loma Prieta Earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. This law directs CGS to identify and map areas prone to the earthquake hazards of liquefaction, earthquake-induced landslides, and amplified ground shaking. The Seismic Hazards Mapping Act requires completion of site-specific geotechnical investigations to identify potential seismic hazards and formulate corrective measures before permits are issued for most developments designed for human occupancy within the Zones of Required Investigation.

As of February 2009, 117 official seismic hazard zone maps showing areas prone to liquefaction and landslides had been published in California, and more are scheduled for 2010. The mapping is being performed in southern California and San Francisco Bay Area. Twenty-seven official maps for the San Francisco Bay Area have been released; preparation of additional maps for San Mateo, Santa Clara, Alameda, and Contra Costa Counties is planned or in progress. Although past earthquakes have caused ground failures in only a small percentage of the total area in mapped hazard zones, a worst-case scenario of a major earthquake during or shortly after a period of heavy rainfall has not occurred in northern California since 1906.

Section 2697 of the Seismic Hazards Mapping Act mandates that, before the approval of a project in a seismic hazard zone, the local jurisdiction (city or county) must require the preparation of a geotechnical report defining and delineating any seismic hazard. CGS has published Special Publication 117A, *Guidelines for Evaluating and Mitigating Seismic Hazards in California*, to assist the engineering geologist and/or civil engineer who must investigate the site and recommend mitigation of identified earthquake-related hazards and to promote uniform and effective statewide implementation of the evaluation and mitigation elements of the Seismic Hazards Mapping Act. Under the act, the local permitting authority—in San Francisco, the San Francisco Department of Building Inspection (DBI)—must regulate certain development projects within the mapped hazard zones. For projects in a hazard zone, DBI requires that the geologic and soil conditions of a project site be investigated and that appropriate mitigation measures, if any, be incorporated into development plans.[119]

The Seismic Hazards Mapping Act and related regulations establish a statewide minimum public-safety standard for mitigation of earthquake hazards. That standard is the minimum level of mitigation for a project that would reduce the risk of ground failure during an earthquake to a level that does not cause the collapse of buildings for human occupancy—but in most cases, not to a level at which no ground failure would occur. The site-investigation reports must be reviewed by a certified engineering geologist or registered civil engineer with competence in the field of seismic hazard evaluation and mitigation. As required by the mitigation measures included below in Section 4.14.5, “Impact Evaluations,” DBI would employ a third-party engineering geologist and/or civil engineer to form a Geotechnical Peer Review Committee, which would complete the technical review. After a site investigation report was approved, subsequent site investigation reports would not be required, provided that new geologic information warranting further investigation was not recorded. The SFBC requires that the recommendations of the report be incorporated in the building design.

[119] “Mitigation” is defined as those measures that are consistent with established practice and reduce seismic risk to acceptable levels. “Acceptable level” of risk is defined as that level that provides reasonable protection of public safety, although it does not necessarily ensure continued structural integrity and functionality of a building.

The City is required to submit one copy of the approved site investigation report to the State Geologist within 30 days after approval. If the City approves a project that is not in accordance with the policies and criteria of the Seismic Hazards Mapping Act, the City is required to explain in writing the reasons for the differences to the State Geologist, within 30 days of the project's approval. The site-specific geotechnical investigation may refine the state's areawide interpretations. If the new documentation supports the site specific interpretation, the State Geologist would file the report as an amendment to the Seismic Hazard Evaluation for the appropriate USGS topographic quadrangle map.

Senate Bill 1953

The CPMC campuses fall under the jurisdiction of OSHPD's seismic-safety requirements for hospitals under California state law. In 1994, in response to the Northridge earthquake, the California Legislature enacted Senate Bill (SB) 1953, which amended the Alfred E. Alquist Hospital Seismic Safety Act. The Alquist Act itself consisted of amendments to the 1973 Hospital Facilities Seismic Safety Act, which was passed in response to the loss of life incurred after the collapse of hospitals during the Sylmar earthquake of 1971. SB 1953 requires hospital facilities to comply with seismic safety building standards, as defined by OSHPD. OSHPD is responsible for carrying out the provisions of SB 1953. SB 1953's predecessor laws established a building standards program for seismic safety under OSHPD's jurisdiction for hospitals built on or after March 7, 1973. The Alquist Act emphasizes that essential facilities, such as hospitals, should remain operational after an earthquake. Hospitals built in accordance with the standards of the Alquist Act resisted the January 1994 Northridge earthquake with minimal structural damage, while several facilities built before the Alquist Act experienced major structural damage and had to be evacuated. Certain nonstructural components of the hospitals did incur damage, even in facilities built in accordance with the structural provisions of the Alquist Act.

SB 1953 was intended to address the issues of survivability of both nonstructural and structural components of hospital buildings after a seismic event. Therefore, the ultimate public safety benefit intended under SB 1953 is for general acute-care hospital buildings to be capable of not only remaining intact after a seismic event, but of operating and providing acute-care medical services after a seismic event. California Health and Safety Code Section 1250(a) defines several different types of health facilities. Different types of facilities, based on purpose, need to meet appropriately stringent requirements.

City/Local

San Francisco General Plan

The *San Francisco General Plan* (1996) provides long-term guidance and policies maintaining and improving the quality of life and the human-made and natural resources of the community. The Community Safety Element includes policies for the avoidance of geologic hazards and/or the protection of unique geologic features. The plan requires detailed site-specific geologic hazard assessments in areas delineated with geologic hazards (seismic hazards, landslides, and liquefaction). Filled land and geologic hazards, such as landslides and shoreline erosion, are addressed in the Environmental Protection Element of the *San Francisco General Plan*. The element includes policies for the promotion of the highest standards of soils engineering, the correction of landslide and shore erosion conditions, and the avoidance of construction on land subject to slide or erosion.

San Francisco 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 California. The 2007 CBC, effective January 1, 2008, is based on the current (2006) IBC. Each jurisdiction in California may adopt its own building code based on the 2007 CBC. Local codes are permitted to be more stringent than Title 24, but, at a minimum, were required to meet all state standards and enforce the regulations of the 2007 CBC beginning January 1, 2008.

San Francisco adopted the 2007 CBC as the basis of the SFBC (Municipal Code Title 17, Chapter 17.04) through Ordinance No. 3789, on December 3, 2007. The full 2007 SFBC consists of the 2006 IBC, as amended by the 2007 CBC, and as further modified by San Francisco amendments designed to be used in conjunction with the 2007 CBC. The SFBC amendments were adopted by the Board of Supervisors on November 6, 2007, through Ordinance 258-07, effective January 1, 2008.

Chapter 16 of the SFBC deals with structural design requirements governing seismically resistant construction (Section 1604), such as 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 (Sections 1613.5 and 1613.6). Included in Chapter 18 of the SFBC are the requirements for foundation and soil investigations (Section 1802); excavation, grading, and fill (Section 1803); allowable load-bearing values of soils (Section 1804); and the design of footings, foundations, and slope clearances (Section 1805), retaining walls (Section 1806), and pier, pile, driven, and cast-in-place foundation support systems (Sections 1808, 1809, and 1810). Chapter 33 of the SFBC includes requirements for safeguards at work sites to ensure stable excavations and cut or fill slopes (Section 3304). Appendix J of the SFBC presents grading requirements for the design of excavations and fills (Sections J103 to J107) and for erosion control (Sections J109 and J110).

Compliance with the SFBC is mandatory for development in San Francisco. Throughout the permitting, design, and construction phases of a building project, San Francisco Planning Department staff, DBI engineers, and DBI building inspectors confirm that the SFBC is being implemented by project architects, engineers, and contractors.

During the design phase for buildings included in the CPMC LRDP, foundation support and structural specifications based on the preliminary foundation investigations would be prepared by the project engineer and architect and would be reviewed for compliance with the SFBC by the San Francisco Planning Department and DBI. During the project construction phase, DBI inspectors would be responsible for enforcing the provisions of the SFBC as implemented by the contractor.

4.14.3 Cumulative Conditions

The geographic context for the analysis of cumulative impacts resulting from geologic hazards is generally site-specific, because each project site has a different set of geologic considerations that would be subject to specific site development and construction standards. Soil and geologic conditions are site specific and there is little, if any, cumulative relationship between the project sites and other areas of San Francisco. As such, the potential for cumulative impacts to occur is geographically limited for many geology and soils impact analyses to immediately adjacent development sites; however, variations from a site-specific cumulative context are identified, where they occur.

4.14.4 Significance Criteria

The thresholds for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the State CEQA Guidelines, which has been adopted and modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable thresholds were used to determine whether implementing the project would result in a significant impact on geology and soils. Implementation of the proposed project would have a significant effect on geology and soils if it would:

- 14a—expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - 14a.1—rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
  - 14a.2—strong seismic ground shaking;
  - 14a.3—seismic-related ground failure, including liquefaction; or
  - 14a.4—landslides;
- 14b—result in substantial soil erosion or the loss of topsoil;

- 14c—be located on a geologic unit or 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;
- 14d—be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, creating substantial risks to life or property;
- 14e—have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater; or
- 14f—change substantially the topography or any unique geologic or physical features of the site.

Proposed Project Features

Cathedral Hill Campus: Cathedral Hill Hospital Site

The depth of excavation for the proposed Cathedral Hill Hospital is estimated to range from 23 feet below grade at Van Ness Avenue and Geary Boulevard, to 64 feet deep at Post Street and Franklin Street. Total soil removal for the hospital site is estimated at 121,295 cubic yards.[120]

The proposed hospital building's shoring would be a soldier beam, lagging, and tieback method.[121] The existing foundation walls would have to be tied back to allow for demolition of the existing partially below-grade garage. The shoring contractor would move on-site before completing demolition at the hospital site. Holes would be drilled into the existing hotel garage through the existing foundation walls that sit outside of the hospital site's property line, which is the majority of the walls on Post Street, Franklin Street, and the west end of the site at Geary Boulevard. The contractor would drill and install tiebacks that would extend under the streets to laterally brace the existing foundation walls. This would allow the demolition subcontractor to remove the existing below-grade suspended slabs and slab-on-grade without allowing subsidence of the adjacent sidewalks or streets. The space below the sidewalks, outside the property line, would be backfilled. After demolition of the existing hotel and office structure, the shoring contractor would move on-site and drill soil-mixed holes along the property lines to set in the soldier beams. This would be a process of drilling into the existing soil and combining it with a cement slurry mix, lowering a steel beam into the mix, and letting it cure. During excavation, the face of these soldier beams would be exposed by scraping the hardened soil-cement mixture off and installing lagging to retain the soil between the soldier beams. Tiebacks are drilled horizontally and attached to the vertical soldier beams to support them as the hole is dug.

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[120] Ibid., page 51.
[121] Ibid., page 53.

Cathedral Hill Campus: Cathedral Hill MOB Site

The proposed Cathedral Hill MOB would extend nine stories, plus a mechanical level above grade and seven levels below grade. This proposed building would require up to 55 feet in depth of excavation at Geary Street and the adjacent property and up to 79 feet in depth along Van Ness Avenue and Cedar Street. The total volume of soil removal required for development of the MOB is estimated to be 92,000 cubic yards.[122]

Shoring for the proposed Cathedral Hill MOB would consist of a continuous soil-cement-mixed wall.[123] The soil-mixed wall would restrict the potential flow of water into the excavated area, allowing reduced dewatering within the excavated area. The shoring contractor would move on-site after demolition. Temporary tiebacks would be required under all four sides of the project. The existing adjacent building east of the site of the proposed Cathedral Hill MOB may have to be underpinned upon the start of shoring, depending on the final depth of the proposed parking levels and the shoring design. The shoring would be monitored regularly to ensure minimum deflection. The soil-cement-mixed wall would be completed with a drill rig. The rig would drill and mix the soil with a cement slurry mix to a depth extending below the foundation level. The drills would be removed and a soldier beam would be installed. After the soil-cement-mixed wall is complete, the excavation would commence. Tiebacks would be installed to support the soldier beams as the site is excavated.

The proposed Van Ness Avenue pedestrian tunnel, which would extend between the Cathedral Hill Hospital on the west side of the street and the Cathedral Hill MOB on the east side of the street, would measure approximately 10 feet in width, 10 feet in height, and approximately 124 feet in length. The total volume of permanent soil removal required for the tunnel site excavation is estimated at approximately 1,700 cubic yards.

The tunnel would be sloped from elevation 121 feet, 4 inches (or about 20 feet beneath Van Ness Avenue) at the entrance to the Cathedral Hill MOB's basement level B2 to bottom at elevation 118 feet (or about 23 feet beneath Van Ness Avenue) at the entrance to the Cathedral Hill Hospital's parking level P3.[124] As currently proposed, the tunnel would be constructed in sections using a "cut-and-cover" construction method. The bottom-up cut-and-cover tunneling technique involves excavating from the ground surface in a supported/shored trench, constructing the structure in the resulting excavation, then backfilling over the structure to the original street grade. Steel plates, or some other method of bridging the excavation, would be used to accommodate traffic flow on Van Ness Avenue during the construction of the tunnel. Additionally, the tunnel would be connected to the proposed

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[122] Ibid., page 52.

[123] Ibid., page 54.

[124] California Pacific Medical Center. 2009 (March 24). *Geotechnical Consultation, California Pacific Medical Center (CPMC)—Cathedral Hill Campus, Van Ness Avenue Connector Tunnel, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 1.

hospital and MOB with a seismic joint provided to allow for independent movement of the tunnel and the two adjoining structures during earthquakes.

Variants

The construction features of the No Van Ness Avenue Pedestrian Tunnel Variant would be identical to those of the proposed projects described above; however, the pedestrian tunnel would not be constructed.

Pacific Campus

Work proposed for this campus would occur over the long term; no near-term work is proposed. Therefore, detailed project features are not available because project designs have not been refined to a sufficient level of detail.

California Campus

No projects are proposed for the California Campus; therefore, no project features are described. No geologic impacts would occur.

Davies Campus: Neuroscience Institute Building Site

The proposed Neuroscience Institute building at the Davies Campus would require excavation up to 6 feet below ground surface, and removal of approximately 6,000 cubic yards of soil.[125] The building's shoring system would most likely be a soldier beam, lagging, and tieback method. The installation of the shoring system would start before completion of the excavation. Soil-mixed holes would be drilled along the excavation boundary lines to set in the soldier beams. During excavation, the face of these soldier beams would be exposed by scraping the hardened soil mixture off and installing lagging to retain the soil between the soldier beams. Tiebacks would be drilled and installed horizontally at a downward angle on the soldier beams to support them as the hole is dug.

Proposed work for the Castro Street/14th Street MOB would occur in the long term; no near-term work is proposed. Therefore, detailed project features are not available because project designs have not been refined to a sufficient level of detail.

St. Luke's Campus: St. Luke's Replacement Hospital Site

The proposed St. Luke's Replacement Hospital would be constructed in the middle of the northern portion of the campus in the area south of the intersection of Cesar Chavez Street and San Jose Avenue. The first level of the new replacement hospital and future entry plaza would be near elevation 64 feet (near existing street grade where

[125] Herrero Boldt. 2010. *CPMC Davies Campus, Neuroscience Institute, Environmental Impact Report Construction Data.* San Francisco, CA. Page 33.

it fronts Cesar Chavez Street). Because of the sloped grade, the basement would be up to 17 feet below the existing ground surface at the southwest corner of the hospital building. The existing utility equipment located between the St. Luke's Hospital tower and the parking lot on San Jose Avenue would be removed and installed on the roof of the proposed St. Luke's Replacement Hospital. Excavation for the St. Luke's Replacement Hospital building would range from a depth of 16 feet along 27th Street to no excavation along Cesar Chavez Street; excavation along Guerrero Street would be 15 feet deep. Approximately 15,200 cubic yards of soil would be removed for the proposed replacement hospital.

The proposed St. Luke's Replacement Hospital's shoring system would be a soldier beam and lagging method. The soldier beams would be installed before the start of excavation. Soil-mixed holes would be drilled along the excavation boundary lines and the soldier beams (steel beams) would be lowered into the holes. During excavation, the face of these soldier beams would be exposed by scraping the hardened soil mixture off and installing lagging (wooden beams) to retain the soil between the soldier beams. Tiebacks may be installed on 27th Street to shore the street and sidewalk. No tiebacks would be used on the west property line adjacent to the residential neighbors.[126]

St. Luke's Campus: MOB/Expansion Building Site

The proposed MOB/Expansion Building would be constructed in the northeast corner of the St. Luke's Campus at the site of the existing hospital tower and parking lot, southwest of the intersection of Cesar Chavez Street and Valencia Street. The lowest parking level of the proposed MOB/Expansion Building would be near elevation 24 feet. Excavation for the MOB/Expansion Building would extend 40–50 feet below the existing ground surface; the excavation would extend about 30 feet below the basement of the existing 12-story tower. Because the ground is sloping, excavation for the adjacent entry plaza would extend up to 13 feet below the existing ground surface at its southwest corner. Approximately 42,000 cubic yards of soil would be removed for the proposed MOB/Expansion Building.

As part of the proposed projects at St. Luke's, the sewer, water, and electrical lines connecting to the campus would be rerouted. The sewer, water, and electrical lines would connect to the campus at the intersection of Cesar Chavez Street and San Jose Avenue and would be routed along Cesar Chavez Street to the west before turning south along Guerrero Street, and running east along 27th Street to the intersection of 27th Street and San Jose Avenue. Excavation for the sewer line would be 850 feet long, 7 feet wide, and 28 feet deep and would remove 6,200 cubic yards of soil. The area excavated for the water line would be 960 feet long, 4 feet wide, and 7 feet deep; excavation would remove 1,000 cubic yards of soil. The area excavated for the electrical line would be 1,800 feet long, 3 feet wide, and 36 inches deep; excavation would remove 600 cubic yards of soil. All trenches in

[126] Ibid., page 58.

excess of 48 inches would be shored using conventional shoring equipment approved by the California Occupational Safety and Health Administration (Cal/OSHA) and removed as the backfill is placed and compacted to standard City specifications.

Variants

The construction features of the Alternate Emergency Department Variant would be largely similar to those of the proposed projects described above. Only the aboveground locations of the Emergency Department, ambulance bay, and loading dock would be changed; this would not affect the excavation, shoring, or foundation design or construction plans.

The sewer variant route would realign the water and electrical lines as described above for the proposed utility route; however, the sewer line would be realigned along Duncan Street, where it would connect with the new sewer line along Valencia Street that would be installed as part of the San Francisco Public Utilities Commission's (SFPUC's) proposed Cesar Chavez Street Sewer System Improvement Project. The area excavated for the sewer line along Duncan Street would be 406 feet long, 8 feet wide, and 13–23 feet deep; excavation would remove 1,850 cubic yards of soil. The sewer variant would require SFPUC's proposed new sewer line along Valencia Street to be increased in size from 54 inches to 84 inches, resulting in excavation of 400 cubic yards more soil than what was assumed for SFPUC's project. Accordingly, the total amount of soil that would be removed for the sewer realignment under this variant would be 2,250 cubic yards. The trench would be shored using conventional Cal/OSHA-approved shoring equipment and removed as the backfill is placed and compacted to standard City specifications.

4.14.5 Impact Evaluations

Methodology

The preliminary geotechnical assessment related to the proposed CPMC LRDP is based on site-specific geotechnical and soils investigations prepared by Treadwell & Rollo and URS (for the proposed Davies Neuroscience Institute building only),[127] as well as published regional information and previously collected data. These investigations describe the geologic, seismic, and soils conditions near and/or within each CPMC campus, and assess the potential impacts from strong ground shaking, liquefaction, differential settlement, and unstable or expansive soils. The geotechnical and soils investigations are based on previous site-specific geotechnical and hazardous materials investigations, updated site investigation efforts, some of which include subsurface borings, and review of published geologic reports and maps. No site-specific investigation was prepared for the proposed

[127] These documents are on file with the Planning Department, 1650 Mission Street, Suite 400, San Francisco 94103, and are available for public review as part of the project file, in Case No. 2005.0555E.

utility route or variant route at the St. Luke's Campus; subsurface information was extrapolated using data gathered during borings advanced in the vicinity of the alignments. As explained in the introduction to Chapter 4 of this EIR, effects on the California Campus are not addressed in the impact evaluations because no construction would occur and almost all CPMC-related use of the California Campus would cease by 2020.

IMPACT GE-1

The project would not expose people or structures to the risk of loss, injury, or death involving rupture of a known earthquake fault or strong seismic ground shaking. (Significance Criteria 14a.1 and 14a.2)

Levels of Significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific: Less than significant*
- *Davies: Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

As discussed above in Section 4.14.1, "Fault Rupture" (page 4.14-8), no earthquake fault zones have been mapped within the city limits and no evidence of fault rupture was observed at the Cathedral Hill, Davies, and St. Luke's Campuses. Thus, the potential for fault rupture is low. Further, designation of new earthquake fault zones in the San Francisco area is not expected in the near future; therefore, surface rupture at the CPMC campuses would be unlikely to occur. **This impact related to surface rupture would be less than significant.**

As is true for the entire Bay Area, all structures on the CPMC campuses could be affected by ground shaking in the event of an earthquake on an active fault in the region. The amount of ground shaking depends on the magnitude of the earthquake, the distance from the epicenter, and the type of earth materials between the receptor and the epicenter. Strong to violent ground shaking (MMI VII to IX; see Table 4.14-2, "Modified Mercalli Intensity Scale," on page 4.14-6 in Section 4.14.1, "Environmental Setting") is expected at all campuses should a major earthquake occur on the San Andreas Fault or other active faults in the region. This level of seismic shaking could considerably damage buildings at and near the CPMC campus sites, and has the potential to injure building occupants. This condition underlies the need for renovated and new acute-care facilities at the CPMC campuses.

The main objective of the proposed CPMC LRDP is to address SB 1953 and SB 1661, which require that acute-care hospitals remain "life-safe"[128] and operational after a seismic event. Activities associated with the proposed LRDP are intended to ensure that all existing and proposed campus structures are in full compliance with SB 1953 and SB 1661, as applicable. The proposed Cathedral Hill Hospital and St. Luke's Replacement Hospital would provide acute-care services at the Cathedral Hill and St. Luke's Campuses, respectively. Therefore, the geotechnical investigations and consultations for the proposed Cathedral Hill Campus and the St. Luke's Campus included a PSHA and DSHA to develop the seismic design recommendations specific to each structure proposed for the campuses in accordance with the CBC, SFBC, and OSHPD requirements. The proposed hospitals at these campuses would be designed in accordance with the site-specific recommendations determined by the geotechnical investigations and consultations.

Additionally, as noted above (see page 4.14-31 in Section 4.14.2, "Regulatory Framework"), the LRDP project must comply with the Seismic Hazards Mapping Act of 1990, which is enforced by OSHPD. The final plans for the proposed hospitals would be reviewed by OSHPD. Therefore, potential damage to the proposed new hospitals under the LRDP from seismic shaking would be addressed as part of the proposed LRDP, through OSHPD's review. OSHPD would also review the new hospitals' building permit applications for compliance with the CBC and SFBC, and for implementation of recommendations in the site-specific geotechnical report to address seismic hazards. This analysis, review, and approval process would ensure that the proposed CPMC LRDP would comply with SB 1953 and SB 1661 and that the proposed Cathedral Hill Hospital and St. Luke's Replacement Hospital would remain life-safe and operational hospitals after a seismic event.

In addition to the life-safety and operational requirements for structures providing acute-care services, all new structures proposed under the LRDP, including the Cathedral Hill MOB, the Davies Campus's Neuroscience Institute building, and the St. Luke's MOB/Expansion Building, would be required to comply with CBC, DBI, and SFBC seismic standards. These new structures proposed under the LRDP would not be used for acute care and would not be required to undergo permit application and design review by OSHPD; however, they would be required to implement the site-specific seismic design requirements presented in the applicable geotechnical investigations, consultations, and evaluations determined by the PSHAs and DSHAs for those sites. DBI would also have design review jurisdiction over the LRDP-proposed utility relocations at the St. Luke's Campus.

The required permit application and design reviews of the hospitals by OSHPD and the nonacute-care buildings by DBI would ensure that **this impact related to ground shaking would be less than significant**.

[128] Life-safety refers to the ability of the structural components on a building to withstand seismic forces as prescribed by applicable building codes. Nonstructural components (e.g., support systems) are not precluded from irreparable damage by building codes.

Cathedral Hill Campus and St. Luke's Campus with Project Variants: As stated previously, no earthquake fault zones have been mapped within the city limits and no evidence of fault rupture was observed at any CPMC campus. Therefore, none of the project variants would affect the potential for exposure to the risk of loss, injury, or death involving rupture of a known earthquake fault. As with the proposed projects, all proposed facilities would remain under the jurisdiction of either OSHPD or DBI, and would be designed in accordance with site-specific design requirements determined by the PSHAs and DSHAs. No project variant would affect the potential for exposure to the risk of loss, injury, or death related to ground shaking. The required permit review procedures by DBI would ensure that **this impact related to both surface rupture and ground shaking would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, or St. Luke's Campus in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

With regard to surface rupture, this long-term impact is identical to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. No earthquake fault zones have been mapped within the city limits and no evidence of fault rupture was observed at the Pacific and Davies Campuses. Thus, for the same reasons as discussed above, surface rupture would be unlikely to occur at these campuses in the long term. **This impact related to surface rupture would be less than significant**.

As stated previously, the potential for strong ground shaking in the San Francisco area underlies the need for renovated and new acute-care facilities at the CPMC campuses. Like the near-term projects, long-term projects at the Pacific and Davies Campuses would be required to comply with CBC, DBI, and SFBC seismic safety standards, which are implemented through the design review process. Improvement Measure I-GE-L1 below would ensure this compliance by requiring preparation of further geotechnical studies. Accordingly, the Castro Street/14th Street MOB at the Davies Campus would be designed according to the site-specific seismic design requirements in force at the time as determined by the PSHAs and DSHAs for the site. The geotechnical investigation for the Pacific Campus did not include an updated PSHA and DSHA in compliance with the CBC and SFBC; however, in accordance with Improvement Measure I-GE-L1, the applicable required geotechnical investigations, including seismic design analysis for specific sites, would be prepared before demolition and construction. CPMC would be required to design and construct the converted ACC building, Webster Street/Sacramento Street Underground Parking Garage, ACC Addition, and North-of-Clay Aboveground Parking Garage in accordance with the site-specific seismic design requirements in force at that time, as determined by the PSHA and DSHA. All long-term projects would be subject to DBI permit applications and design review. No acute-care facilities are proposed for the Pacific and Davies Campuses in the long term and no OSHPD involvement would be required. Therefore, after the DBI review and implementation of Improvement Measure I-GE-L1, **this less-than-significant impact related to ground shaking would be further reduced**.

Improvement Measure for Pacific and Davies Campuses (long term)

I-GE-L1 Additional geotechnical studies shall be conducted following development of detailed design-level plans for the long-term projects at the Pacific and Davies Campuses. All recommendations in the studies shall be implemented by CPMC.

Long-term projects would comply with CBC, DBI, and SFBC seismic safety standards to ensure that the impacts related to seismic shaking would be less than significant. Improvement Measure I-GE-L1 would ensure that geotechnical studies are updated and prepared at the time that the design-level plans for long-term projects at the Pacific and Davies Campuses are finalized, further ensuring compliance with seismic safety standards. All recommendations in the geotechnical studies would be implemented and followed. **The less than significant impacts related to seismic ground shaking would be further reduced following implementation of Improvement Measure I-GE-L1.**

IMPACT GE-2

The project would not expose people or structures to the risk of loss, injury, or death involving ground failure, including liquefaction, or be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in liquefaction or lateral spreading. (Significance Criteria 14a.3 and 14c)

Levels of Significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Near-Term Projects

◆ Cathedral Hill Campus

The proposed Cathedral Hill Campus would not be located within a liquefaction hazard zone as established by CGS, but would be located within an area that has "moderate" susceptibility to liquefaction as mapped by USGS. A 2-foot-thick, medium-dense clayey sand layer encountered in one boring in the northeastern portion of the site of the proposed Cathedral Hill Hospital was determined by the geotechnical investigation to be potentially liquefiable. However, this layer was not observed to be continuous throughout the site of the proposed hospital, and the geotechnical investigation determined that the layer is deep enough below the proposed basement that liquefaction within the layer would not affect the performance of the proposed hospital's foundation.[129]

In general, the soils beneath the groundwater table at the campus site, including the sites of the proposed Cathedral Hill MOB and Van Ness Avenue pedestrian tunnel, consist of dense to very dense sand and clayey and silty sand, which would not be susceptible to liquefaction.[130, 131, 132] Additionally, the geotechnical investigations for the proposed Cathedral Hill Campus determined that because no continuous potentially liquefiable layers were observed at the campus site, the potential for lateral spreading is very low. Existing conditions at the 1375 Sutter Street building would not change with implementation of the LRDP because only interior renovation would occur. Therefore, **impacts related to potential for lateral spreading and liquefaction would be less than significant**.

Cathedral Hill Campus with No Van Ness Avenue Pedestrian Tunnel Variant: Removing the Van Ness Avenue pedestrian tunnel from near-term projects at the proposed Cathedral Hill Campus would not affect the potential for liquefaction or lateral spreading. The potential for these hazards at the tunnel location would remain low. Similarly, eliminating tunnel construction not affect the liquefaction risks at the sites of the proposed Cathedral Hill Hospital and Cathedral Hill MOB. Therefore, for the same reasons as discussed above, **impacts related to potential for lateral spreading and liquefaction would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at the proposed Cathedral Hill Campus in the near term.

◆ Davies Campus

As discussed under "Liquefaction" on page 4.14-27 in Section 4.14.1, "Environmental Setting," the site of the proposed Neuroscience Institute building at the Davies Campus is not located within a liquefaction hazard zone as established by CGS; in addition, the soils beneath the groundwater table generally consist of medium-dense to

[129] California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 28.

[130] Ibid. Page 28.

[131] California Pacific Medical Center. 2009 (October 2). *Updated Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 19.

[132] California Pacific Medical Center. 2009 (March 24). *Geotechnical Consultation, California Pacific Medical Center (CPMC)—Cathedral Hill Campus, Van Ness Avenue Connector Tunnel, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

dense sand and stiff to hard clay, which would not be susceptible to liquefaction or lateral spreading.[133] Accordingly, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the near term.

◆ St. Luke's Campus

As discussed under "Liquefaction" on page 4.14-27 in Section 4.14.1, "Environmental Setting," the dense to very dense sand beneath the area of the proposed St. Luke's Replacement Hospital would not be susceptible to liquefaction. Additionally, because no potentially liquefiable layers were observed at the campus, the potential for lateral spreading is very low.[134] The geotechnical investigation for the site of the proposed MOB/Expansion Building determined that the underlying medium-dense clayey and silty sand is liquefiable and could result in liquefaction-induced settlement on the order of one-quarter inch (in the vicinity of the proposed entry plaza/MOB site) to 2 inches (beneath sidewalks along Cesar Chavez and Valencia Streets) during a major earthquake on a nearby fault.[135] Additionally, the geologic and geotechnical input for the proposed utility route under the LRDP determined that potentially liquefiable soil could be present in the location of the easternmost end of the route on Cesar Chavez Street and that liquefaction-induced ground settlement on the order of 2–3 inches could occur during a major earthquake on a nearby fault.[136]

As part of the LRDP's near-term projects at the St. Luke's Campus, the existing St. Luke's Hospital tower would be demolished and the loose to medium-dense sand and gravel above and below the design groundwater level would be removed in their entirety by the planned excavation for the proposed below-grade parking structure for the MOB/Expansion Building. Furthermore, excavation for the entry plaza would extend into dense to very dense sand or bedrock, which is likely present. Therefore, the potential for liquefaction and lateral spreading at the locations of the proposed MOB/Expansion Building and entry plaza is judged to be low.[137] Additionally, potentially liquefiable soil beneath the location of the proposed utility relocation would be removed from the bottom of the excavation area and replaced with engineered fill. Excavation for the proposed utility route would be properly supported using internally braced or a soldier-pile-and-lagging shoring system as recommended by

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[133] California Pacific Medical Center. 2006. *Geotechnical Study, Planned Medical Office Building and Retaining Wall, Davies Medical Center, San Francisco, California*. Prepared by URS, San Francisco, CA.

[134] California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 17.

[135] California Pacific Medical Center. 2010 (February 26). *Geology and Geotechnical Input for Environmental Impact Report, Medical Office Building, St. Luke's Replacement Hospital, San Francisco, CA.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 10.

[136] California Pacific Medical Center (Sutter Health/CPMC). 2010 (February 26). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 1, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[137] California Pacific Medical Center. 2010. *Mitigation Measures Regarding Geologic and Geotechnical Impacts, CPMC Long Range Development Plan, San Francisco, CA.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 2.

the geologic and geotechnical input.[138] With implementation of these design features, **impacts related to liquefaction and lateral spreading would be less than significant**.

St. Luke's Campus with Alternate Emergency Department Location Variant: Implementing this project variant would not affect the susceptibility of the St. Luke's Campus and vicinity to liquefaction or lateral spreading. The existing structures in the location susceptible to liquefaction, lateral spreading, and settlement would still be demolished and no critical utilities would be installed within this area; the variant would change only the locations of certain facilities associated with the St. Luke's Replacement Hospital. Therefore, for the same reasons as discussed above, **this impact would be less than significant**.

St. Luke's Campus with Cesar Chavez Street Utility Line Alignment Variant: As discussed under "Liquefaction" in Section 4.14.1, "Environmental Setting" (page 4.14-27), the location of the sewer variant (along Duncan Street) consists of dense to very dense sand, which would not be susceptible to liquefaction or lateral spreading. The susceptibility of the remainder of the St. Luke's Campus and vicinity would be as described above. Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the St. Luke's Campus in the near term.

Long-Term Projects

◆ Pacific Campus

The Pacific Campus is not located within a liquefaction hazard zone as established by CGS and the soils beneath the groundwater table generally consist of dense sand and clayey sand, which would not be susceptible to liquefaction or lateral spreading. The design plans for the Pacific Campus have not been finalized and the analysis of potential impacts at the campus is presented at a programmatic level; however, the subsurface materials at the Pacific Campus would not change between the time of the investigation and the implementation of the long-term projects. Additionally, new liquefaction hazard zones would not be expected to be designated within the San Francisco area that would include the campus location. Therefore, no project-related exposure of people or structures to risks from liquefaction and lateral spreading would result. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at the Pacific Campus in the long term.

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[138] California Pacific Medical Center (Sutter Health/CPMC). 2010 (March 12). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 1, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

◆ Davies Campus

As noted under the discussion of near-term projects at the Davies Campus, this campus is not located within a liquefaction hazard zone as established by CGS. The subsurface materials at the Davies Campus would not change between the time of investigation and the implementation of long-term projects. Additionally, new liquefaction hazard zones are not expected to be designated within any part of San Francisco that would include the campus location. Thus, no additional evaluation would be required for the Davies Campus upon finalization of design plans. **This impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the long term.

IMPACT GE-3

The project would not expose people or structures to the risk of loss, injury, or death involving landslides or be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslides. (Significance Criteria 14a.4 and 14c)

Levels of Significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

As discussed above under "Slope Stability/Landsliding" (pages 4.14-17 through 4.14-18) in Section 4.14.1, "Environmental Setting," the proposed Cathedral Hill Campus and existing Davies Campus are not located within an area susceptible to potential seismically induced landslide hazards as mapped by the *San Francisco General Plan* or by the State of California's seismic hazards zone map. No landslides have been mapped on or near the site of the proposed Cathedral Hill Campus, including the locations of the proposed Cathedral Hill Hospital, Cathedral Hill MOB, and Van Ness Avenue pedestrian tunnel, or at the location of the Neuroscience Institute building at the Davies Campus; further, the geotechnical investigation for the campuses did not determine the materials at these sites to be susceptible to seismically induced landsliding. The St. Luke's Campus, including the locations of the proposed St. Luke's Replacement Hospital, MOB/Expansion Building, and utility route, is located within an area susceptible to potential seismically induced landslide hazards as mapped by the *San Francisco General Plan*. However, the campus is not located in an area susceptible to seismically induced landsliding as shown in the State of California's seismic hazards zone map, and no evidence of past or ongoing landslide activity was observed during review of aerial photographs and site reconnaissance. Therefore, at the Cathedral Hill, Davies, and St. Luke's Campuses, **the impact related to seismically induced landsliding would be less than significant**.

Given the sloping topography of the campuses, the sandy nature of the native geologic materials, and presence of unengineered artificial fill beneath the sites, the potential for on-site aseismic landsliding[139] during construction is high. Excavations for the Cathedral Hill Hospital, Cathedral Hill MOB, and Van Ness Avenue pedestrian tunnel at the Cathedral Hill Campus; the Neuroscience Institute building at the Davies Campus; and the proposed St. Luke's Replacement Hospital, St. Luke's MOB/Expansion Building, and St. Luke's utility route could fail if the sandy subsurface materials exposed in the excavated pit walls were not properly supported. In addition to on-site aseismic landsliding resulting from excavation, off-site aseismic landsliding could be induced upslope of the locations of the proposed structures when support provided by the excavated sediment at these sites is removed. The proposed excavation and shoring methods described above under "Cathedral Hill Campus Project Features," "Davies Campus Project Features," and "St. Luke's Campus Project Features" (beginning on page 4.14-37) were developed based on the site-specific geotechnical investigations at the campuses. The final shoring and pit wall support methods would be prepared in coordination with a licensed engineer and reviewed as part of the permit review procedures by DBI. Site-specific excavation support systems and design review by DBI would ensure that proper shoring and slope angles for temporary slopes and excavations are maintained during construction. Therefore, at all three campuses, **the impact related to aseismic landsliding during project construction would be less than significant**.

On- or off-site aseismic landsliding also could occur during project operation if the subsurface materials are not capable of supporting the weight of the proposed structures. The geotechnical investigations, consultations, and evaluations for the Cathedral Hill, Davies, and St. Luke's Campuses determined the following:

- At the sites of the proposed Cathedral Hill Hospital and Cathedral Hill MOB, the upper soil layers to depths of approximately 13 feet below ground surface would not be suitable to support the foundations of the proposed buildings. However, the depth of excavation for the hospital and MOB would range from 23 to 79 feet below ground surface, through these layers to competent material that is suitable for foundation support. Additionally, excavation for the Van Ness Avenue pedestrian tunnel would extend to between 20 and 30 feet below ground surface.

[139] Aseismic landsliding is slope failure in the absence of notable earthquakes.

- At the Davies Campus, the upper soil layers to depths of approximately 15 feet below ground surface would not be suitable to support the foundations of the proposed Neuroscience Institute building. However, excavation for the building would remove 6 feet of this material and the foundation would rest on cast-in-place concrete piers.

- At the sites of the proposed St. Luke’s Replacement Hospital and MOB/Expansion Building, the upper fill and topsoil layers to depths of approximately 9 feet below ground surface (hospital site) and 15 feet below ground surface (MOB/Expansion Building site) would not be suitable to support the foundations of the proposed buildings. However, excavation for the St. Luke’s Replacement Hospital and MOB/Expansion Building would extend to depths of up to 17 feet and 50 feet, respectively, below ground surface. The upper fill and topsoil layers along the proposed utility route would also be removed during excavation to depths of 28 feet, approximately 18–25 feet into bedrock. Accordingly, excavation would extend through these layers to competent material that is suitable for foundation support.

Additionally, foundation methods proposed for all structures at all three campuses would be consistent with the site-specific recommendations for footings, mats, lateral loads and pressures, piers, piles, floor slabs, underdrains, and subgrade elevations determined by the subsurface materials and groundwater elevations. Therefore, at all three campuses, **the impact related to aseismic landsliding during project operation would be less than significant**.

Cathedral Hill Campus with No Van Ness Avenue Pedestrian Tunnel Variant: Eliminating the Van Ness Avenue pedestrian tunnel from near-term projects at the proposed campus would not affect the risk of seismically induced landslides because the proposed campus is not susceptible to landslides. The risk of aseismically induced landslides would be slightly reduced because the total amount of construction required would be reduced; however, the potential for aseismic landsliding during construction of other project elements would remain high. Therefore, this impact would be slightly less severe than the impact of near-term projects described above. **This impact would be less than significant.**

St. Luke’s Campus with Alternate Emergency Department Location Variant: This project variant would not affect the susceptibility of the St. Luke’s Campus and vicinity to seismically induced or aseismic landsliding. The variant would change only the locations of certain facilities associated with the St. Luke’s Replacement Hospital, and proposed structures would still be constructed in accordance with the shoring and stability recommendations contained in the site-specific geotechnical reports. **This impact would be less than significant**.

St. Luke’s Campus with Cesar Chavez Street Utility Line Alignment Variant: As described in the discussion of soil and groundwater conditions at the St. Luke’s Campus (page 4.14-13), the location of the sewer variant consists of dense to very dense sand with shallow bedrock. Excavation for the sewer variant route would be properly supported using internally braced or a soldier-pile-and-lagging shoring system as recommended by the geologic and geotechnical input for the variant. The susceptibility of the remainder of the St. Luke's Campus and vicinity to landsliding would be as described above. **This impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Pacific, or St. Luke's Campus in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

As discussed under "Slope Stability/Landsliding" on pages 4.14-17 and 4.14-18 in Section 4.14.1, "Environmental Setting," the Pacific and Davies Campuses are not located within an area susceptible to potential landslide hazards as mapped by the *San Francisco General Plan* or by the State of California's seismic hazards zone map. No landslides have been mapped on or near either campus, and the geotechnical investigations for these campuses did not determine the site materials to be susceptible to landslides. The design plans for the Pacific and Davies Campuses have not been finalized, and the analysis of potential impacts at these campuses remains at a programmatic level; however, the subsurface materials at the Pacific and Davies Campuses would not change between the time of the investigation and the implementation of the long-term projects. Additionally, it is not expected that new hazard zones with the potential for seismically induced landslides would be designated within any area of San Francisco that would include the campus locations. Accordingly, no additional evaluation of potential impacts on these campuses caused by seismically induced landslides would be required after finalization of design plans. **The impact related to seismically induced landslides would be less than significant**.

The subsurface materials at the Pacific and Davies Campuses would not change between the time of investigation and the implementation of long-term projects; however, the location, design, and size of the converted ACC building, ACC Addition, Webster Street/Sacramento Street Underground Parking Garage, and North-of-Clay Aboveground Parking Garage at the Pacific Campus and the Castro Street/14th Street MOB at the Davies Campus could change. Changes in the weight and footprint of the proposed structures would have the potential to exceed the load-bearing properties of the subsurface materials. In accordance with Improvement Measure I-GE-L3 below, additional geotechnical investigations for the campuses would occur in the future, as long-term plans for proposed structures are developed and refined. Future investigations would determine the appropriate structural properties for the proposed buildings based on the site-specific design requirements in order to ensure that the final footprints and structural loads of the proposed long-term buildings would be adequately supported by the subsurface materials at the campuses. Accordingly, **the impact related to seismically induced landslides would be less than significant**.

Improvement Measure for Pacific and Davies Campuses (long term)

I-GE-L3 This improvement measure is identical to Improvement Measure I-GE-L1.

Long-term projects would comply with site-specific design requirements to ensure that impacts related to seismically induced landslides would be less than significant. Improvement Measure I-GE-L3 would ensure that geotechnical studies are updated and prepared once the design-level plans for long-term projects at the Pacific and Davies Campuses are finalized, further ensuring compliance with design standards. All recommendations in the geotechnical studies would be implemented and followed. **Less-than-significant impacts related to seismically induced landslides would be further reduced following implementation of Improvement Measure I-GE-L3.**

IMPACT GE-4 *The project would not result in substantial erosion or loss of topsoil. (Significance Criterion 14b)*

Levels of Significance:

- *Cathedral Hill (with or without project variant): Less than significant with mitigation*
- *Pacific: Less than significant with mitigation*
- *Davies (near term and long term): Less than significant with mitigation*
- *St. Luke's (with or without either project variant): Less than significant with mitigation*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

As discussed under "Erosion" on page 4.14-24 in Section 4.14.1, "Environmental Setting," the CPMC campus sites are almost entirely paved or developed with buildings, and no evidence of localized erosion was observed. Exposed fill and native sand, including dune sand deposits, would be moderately to highly susceptible to erosion resulting from stormwater runoff when exposed during construction-related activities such as excavation. Topsoil and underlying soils at the construction sites would be disturbed during project-related excavation and grading activities. In most cases, the greatest soil erosion hazard would occur during the excavation and construction of the buildings' foundations when the soil is exposed. Construction vehicles at all campus sites, including haul trucks removing excavated sediments, would entrain sediment on their tires in the pit and carry it to surface streets, where it would deposited and eventually be washed into the nearby storm drains. Increased sediment loads in storm drains from construction dewatering and deposition on streets from vehicle tires also would add incrementally to wastewater treatment requirements. Similarly, as stated on page 4.15-35 in Section 4.15, "Hydrology and Water Quality," soil stockpiles and excavated portions of the sites would be exposed to runoff; if not managed properly, the runoff could cause increased erosion. Without proper controls, these construction activities would expose loose soils to both wind and water erosion. See Impact HY-3, beginning on page 4.15-34 of this EIR, for further discussion. **This impact would be potentially significant.**

Cathedral Hill Campus and St. Luke's Campus with Project Variants: See Impact HY-3, beginning on page 4.15-34, for a detailed discussion of this impact. For the same reasons as described in Impact HY-3, with implementation of either the No Van Ness Avenue Pedestrian Tunnel Variant (Cathedral Hill Campus) or the Cesar Chavez Street Utility Line Alignment Variant (St. Luke's Campus), the impact would be similar to but slightly less than the impact of near-term projects discussed above. With implementation of the Alternate Emergency Department Location Variant at St. Luke's, the impact would be similar to the impact of near-term projects described above. For the same reasons as described above, **this impact would be potentially significant**.

Mitigation Measure for Cathedral Hill (with or without project variant), Davies (near term), and St. Luke's Campuses (with or without either project variant)

M-GE-N4 CPMC shall implement Mitigation Measure M-HY-N3, as described in Section 4.15, "Hydrology and Water Quality," beginning on page 4.15-36.

As detailed on page 4.15-36 of this EIR, Mitigation Measure M-HY-N3 would reduce the potential for erosion by requiring implementation of a stormwater pollution prevention plan (SWPPP). Therefore, **implementing Mitigation Measure M-GE-N4 at the proposed Cathedral Hill Campus and at the Davies and St. Luke's Campuses would reduce Impact GE-4 to a less-than-significant level**.

Long-Term Projects

◆ Pacific and Davies Campuses

This long-term impact is similar to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. For the same reasons as discussed above, **this impact would be potentially significant**.

Mitigation Measure for Pacific Campus and Davies Campus (long term)

M-GE-L4 CPMC shall implement Mitigation Measure M-HY-N3, as described in Section 4.15, "Hydrology and Water Quality," beginning on page 4.15-36.

As detailed on page 4.15-36 of this EIR, implementing Mitigation Measure M-HY-N3 would reduce the potential for erosion by requiring implementation of a SWPPP. Therefore, **implementing Mitigation Measure M-GE-L4 at the Pacific and Davies Campuses would reduce Impact GE-4 to a less-than-significant level**.

IMPACT GE-5

The project would not expose people or structures to the risk of loss, injury, or death involving ground failure, including densification or seismic settlement. (Significance Criterion 14c)

Levels of Significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific: Less than significant with mitigation*
- *Davies (near term): Less than significant; (long term): Less than significant with mitigation*
- *St. Luke's (with or without either project variant): Less than significant*

Near-Term Projects

◆ Cathedral Hill Campus

During the investigation at the proposed Cathedral Hill Campus, zones of loose to medium-dense sand, which could be susceptible to seismically induced settlement, were encountered within the fill and the upper layers of the dune sand. In general, however, the geotechnical investigations at the sites for the proposed Cathedral Hill Hospital and Cathedral Hill MOB determined that the sandy soil above the groundwater table is sufficiently dense and/or cohesive for densification potential to be low. Additionally, excavation for the planned basements of the proposed Cathedral Hill Hospital and Cathedral Hill MOB at these locations would extend well below the zones of loose geologic material (64 feet and 79 feet below ground surface, respectively).

The geotechnical consultation for the proposed Van Ness Avenue pedestrian tunnel determined that the sediment in this area would be susceptible to potential settlement of 1–2 inches. As with the proposed aboveground structures, the tunnel would also extend well below the loose soil zones and would be founded on dense to very dense sand. Additionally, the construction of the tunnel would be "cut and cover," where the soil above the tunnel would be excavated and replacement cover would be placed as engineered fill. The consultation determined that potential settlement in the footprint of the proposed tunnel would not affect the performance of the structure.

The ground adjacent to the proposed buildings on the Cathedral Hill Campus (streets, sidewalks, and landscaping areas) may potentially experience settlement ranging from 1 to 3 inches; this material would not be excavated and replaced with engineered fill as part of the proposed LRDP. Although no buildings or structures are proposed for these locations, connections to off-site utilities would be located within these areas. Should seismic settlement occur, connections to off-campus utilities could be severed and the ability of the proposed Cathedral Hill Campus to remain operational following a seismic event, as required by SB 1953 and SB 1661, would be impaired. (For a discussion of utilities, see Section 4.12, "Utilities and Service Systems.") However, to address the potential for settlement, the proposed project design includes flexible connections between off-site utilities and the campus buildings. Therefore, **this impact would be less than significant**.

Cathedral Hill Campus with No Van Ness Avenue Pedestrian Tunnel Variant: Removing the Van Ness Avenue pedestrian tunnel from near-term projects at the proposed Cathedral Hill Campus would not affect the potential for densification or seismic settlement. Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures related to settlement are required at the Cathedral Hill Campus in the near term.

◆ Davies Campus

During the investigation at the location of the proposed Neuroscience Institute building, loose sandy fill was encountered in the southeastern portion of the site, which could settle up to 1.5 inches.[140] However, the building's planned basement would extend well below the depth of the fill material, and effects related to settlement of this fill would not occur.[141] Loose sandy fill outside of the building footprint could be susceptible to seismically induced settlement on the scale of one-quarter inch to 1 inch. Although this soil would be removed within the building footprint, settlement could occur where not removed (sidewalks, exterior slabs, utility connections). Should seismically induced settlement occur, sidewalk and exterior slabs could crack and connections with utilities would be severed. (For a discussion of utilities, see Section 4.12, "Utilities and Service Systems.") However, to address the potential for settlement, the project design includes flexible utility connections and hinged or articulated slabs for the building. Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures related to settlement are required at the Davies Campus in the near term.

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[140] California Pacific Medical Center. 2006. Geotechnical Study, Planned Medical Office Building and Retaining Wall, Davies Medical Center, San Francisco, California. San Francisco, CA. Prepared by URS, San Francisco, CA.

[141] California Pacific Medical Center. 2010. *Mitigation Measures Regarding Geologic and Geotechnical Impacts, CPMC Long Range Development Plan, San Francisco, CA.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 6.

◆ St. Luke's Campus

The subsurface materials in the vicinity of the proposed St. Luke's Replacement Hospital are generally too clayey and dense for seismic settlement to occur.[142] Subsurface materials in the area of the proposed MOB/Expansion Building to a depth of 16 feet below ground surface would be susceptible to seismic settlement on the order of 1 inch to 1.5 inches over a horizontal distance of 30 feet, resulting in one-quarter inch of local densification settlement at the ground surface.[143] However, excavation for the proposed MOB/Expansion Building would extend below the bottom of the liquefiable layer to a depth of 40–50 feet below ground surface. Therefore, the potential for effects on liquefiable soil would be removed during site grading. Anticipated settlement in the vicinity of the northeasternmost section of the proposed utility route (at the intersection of Cesar Chavez Street and San Jose Avenue) would be on the order of 1–2 inches over a horizontal distance of 50 feet.[144] As described above under Impact GE-2 (beginning on page 4.14-45), soil beneath the location of the proposed utility relocation would be removed from the bottom of the excavation and replaced with engineered fill. This would ensure that subsurface materials susceptible to settlement would be removed before installation of the utility lines. Accordingly, **this impact would be less than significant**.

St. Luke's Campus with Alternate Emergency Department Location Variant: This project variant would not affect the susceptibility of the St. Luke's Campus and vicinity to densification or seismic settlement because only the locations of certain facilities associated with the St. Luke's Replacement Hospital—and not the project footprint or other specifications—would change. Therefore, **this impact would be less than significant**.

St. Luke's Campus with Cesar Chavez Street Utility Line Alignment Variant: This project variant would not affect the susceptibility of the St. Luke's Campus and vicinity to densification or seismic settlement because the geologic and geotechnical input for the variant determined that the potential for settlement at the location of the sewer route is small. The settlement potential for the locations of the St. Luke's Replacement Hospital and MOB/Expansion Building would be unchanged. Therefore, **this impact would be less than significant.**

Mitigation Measure: No mitigation or improvement measures related to settlement are required at the St. Luke's Campus in the near term.

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[142] Gilpin Geosciences. 2008 (December 12). *Geologic Hazard Investigation, St. Luke's Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco. Appendix A in: California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[143] California Pacific Medical Center. 2010 (February 26). *Geology and Geotechnical Input for Environmental Impact Report, Medical Office Building, St. Luke's Replacement Hospital, San Francisco, California*. Prepared by Treadwell & Rollo, San Francisco, CA.

[144] California Pacific Medical Center (Sutter Health/CPMC). 2010 (March 12). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 1, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

Long-Term Projects

◆ Pacific Campus and Davies Campus

The geotechnical investigations at the Pacific and Davies Campuses determined that in general, the sandy soil above the groundwater table is sufficiently dense and/or cohesive that the potential for densification is low at the proposed locations of the ACC building, ACC Addition, Webster Street/Sacramento Street Underground Parking Garage, and North-of-Clay Aboveground Parking Garage at the Pacific Campus and Castro Street/14th Street MOB at the Davies Campus. The design plans for these structures have not been finalized and the analysis of potential impacts remains at a programmatic level; however, the subsurface materials at the campuses would not change between the time of the investigation and the implementation of the long-term projects. Accordingly, **this impact would be potentially significant**.

Mitigation Measure for Pacific Campus and Davies Campus (long term)

M-GE-L5 This mitigation measure is identical to Improvement Measure I-GE-L1 above (see Impact GE-1).

Mitigation Measure M-GE-L5 would ensure that geotechnical studies are updated and prepared once the design-level plans for long-term projects at the Pacific and Davies Campuses are finalized. All recommendations in the geotechnical studies would be implemented and followed. Accordingly, the appropriate level of flexibility of utility connections would be determined and incorporated into the final design of long-term projects. **Impacts related to densification or seismic settlement would be less than significant following implementation of Mitigation Measure M-GE-L5.**

IMPACT GE-6 *The project would not be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, resulting in subsidence or collapse. (Significance Criterion 14c)*

Levels of Significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke’s (with or without either project variant): Less than significant with mitigation*

Near-Term Projects

◆ Cathedral Hill and Davies Campuses

San Francisco has no agricultural land uses and no petroleum wells are located within the city limits. The City pumps groundwater from within the city limits for landscape irrigation at the Harding Park Golf Course, San Francisco Zoo, and Golden Gate Park. The City's proposed Groundwater Supply Project includes plans for six new wells in the western part of the city to operate in 2013, with total pumping of up 4 million gallons per day. However, the Cathedral Hill and Davies Campuses are located in separate groundwater basins from those used by the existing and proposed new wells; thus, campus groundwater would not be affected by those ongoing or planned groundwater extractions. As discussed under "Soil and Groundwater Conditions" on pages 4.14-10, 4.14-10, 4.14-11, and 4.14-12 in Section 4.14.1, "Environmental Setting," subsurface exploration at the locations of the proposed Cathedral Hill Hospital, Cathedral Hill MOB, and Van Ness Avenue pedestrian tunnel at the proposed Cathedral Hill Campus and Neuroscience Institute building at the Davies Campus did not reveal soft, compressible sediments that would be susceptible to subsidence. Accordingly, the risk of ground subsidence at the campuses and immediate vicinity would be low.

Long-term groundwater dewatering would not be needed at either the proposed Cathedral Hill Campus or the Davies Campus and thus would not result in long-term subsidence. However, excavation activities during construction of the Cathedral Hill MOB may encounter groundwater, which would require temporary dewatering. Removal of large amounts of water from the water table during construction dewatering has the potential to result in subsidence as overlying soil loses support from the volume of the water. However, the geotechnical reports for the Cathedral Hill Campus determined that the soil at the location of the proposed Cathedral Hill MOB is primarily dense sand and the groundwater level is relatively deep. Therefore, anticipated settlement would not be expected to exceed one-quarter inch and subsidence would not present a hazard to the MOB site.[145] In addition, Improvement Measure I-GE-N6, below, would ensure development of an excavation monitoring program for excavation of the proposed Cathedral Hill MOB to detail procedures for monitoring of dewatering activities. Dewatering of groundwater is not anticipated to be needed for construction of the Cathedral Hill Hospital and Van Ness Avenue pedestrian tunnel, or for the Neuroscience Institute building on the Davies Campus. Thus, ground subsidence related to groundwater dewatering would not be expected to occur at those construction sites. Construction would not induce a change in groundwater at adjacent streets and properties, indirectly resulting in ground subsidence. Thus, **the impact related to subsidence would be less than significant**.

[145] California Pacific Medical Center. 2010. *Mitigation Measures Regarding Geologic and Geotechnical Impacts, CPMC Long Range Development Plan, San Francisco, CA*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 4.

The soil beneath the locations of the proposed Cathedral Hill Hospital, Cathedral Hill MOB, and Van Ness Avenue pedestrian tunnel was determined by the geotechnical investigations to generally consist of stiff to hard clay and dense sand materials. The soil beneath the location of the proposed Neuroscience Institute building at the Davies Campus was determined by the geotechnical investigation to consist of medium-dense to dense sandy clay. The relative densities of the soils do not indicate a susceptibility to collapse. Accordingly, the potential for soil collapse at the sites would be low. Because the hazard of induced soil collapse is low at these proposed building sites, it similarly would create a low hazard of indirectly inducing soil collapse at adjacent streets and properties. **The impact related to soil collapse would be less than significant.**

Cathedral Hill Campus with No Van Ness Avenue Pedestrian Tunnel Variant: This project variant would not affect the risk of subsidence at the proposed Cathedral Hill Campus or the susceptibility of soils on the campus site to collapse. Therefore, for the same reasons as described above, **this impact would be less than significant**.

Improvement Measure for Cathedral Hill Campus (near term)

I-GE-N6 An excavation monitoring program shall be developed for construction of the Cathedral Hill MOB. The program shall include requirements for the installation and regular monitoring of survey points and inclinometers should dewatering be required. Excavation and dewatering activities shall be shut down should unacceptable movement of overlying soil occur.

Implementing Improvement Measure I-GE-N6 at the proposed Cathedral Hill Campus would further reduce the less-than-significant impact GE-6 by ensuring that unanticipated effects of dewatering activities are monitored.

Mitigation Measure: No mitigation or improvement measures are required at the Davies Campus in the near term.

◆ St. Luke's Campus

San Francisco has no agricultural land uses and no petroleum wells are located within the city limits. The City pumps groundwater from within the city limits for landscape irrigation at the Harding Park Golf Course, San Francisco Zoo, and Golden Gate Park. The City's proposed Groundwater Supply Project includes plans for six new wells in the western part of the city to operate in 2013, with total pumping of up 4 million gallons per day. However, the St. Luke's Campus is located in separate groundwater basins from those used by the existing and proposed new wells; thus, campus groundwater would not be affected by those ongoing or planned groundwater extractions. As discussed in the description of St. Luke's soil and groundwater conditions on page 4.14-13, subsurface exploration at the locations of the St. Luke's Replacement Hospital and MOB/Expansion Building did not reveal soft, compressible sediments that would be susceptible to subsidence. Accordingly, the risk of ground subsidence from soft compressible soils at the campus would be low.

Long-term groundwater dewatering would not be needed at the St. Luke's Campus and thus would not result in long-term ground subsidence. However, excavation activities during construction of the St. Luke's Replacement Hospital and MOB/Expansion Building would likely encounter groundwater, which would require dewatering. Construction of the St. Luke's Replacement Hospital would require only minor amounts of local dewatering; however, dewatering during excavation of the shoring system for the MOB/Expansion Building would require the removal of large amounts of groundwater. Excavation for the proposed utility route could also potentially encounter groundwater that would require dewatering. Removing large amounts of water from the water table during dewatering has the potential to result in ground subsidence at the MOB/Expansion Building and utility routes sites and at adjacent streets and properties as overlying soil loses support from the volume of the water. Accordingly, **the impact related to ground subsidence from construction dewatering would be potentially significant**.

The soil beneath the locations of the proposed St. Luke's Replacement Hospital and MOB/Expansion Building was determined by the geotechnical investigations to generally consist of stiff to hard clay and dense sand materials. Loose, sandy soil within some of the upper artificial fill at the St. Luke's Campus, including along the proposed utility route, would be susceptible to collapse; however, excavation for the St. Luke's Replacement Hospital, MOB/Expansion Building, and utility route would extend below the upper fill layers to depths of 15–16 feet, 40–50 feet, and 28 feet below ground surface for the sewer line. Excavation for the water and electrical lines would only extend to 7 feet and 36 inches deep, respectively. However, unsuitable soil beneath the proposed water and electrical routes would be removed from the bottom of the excavation and replaced with engineered fill. Accordingly, soil potentially susceptible to collapse at the site would be removed during excavation. Because stable engineered fill would be placed at the site, the potential for induced soil collapse at adjacent streets and properties would be eliminated. **The impact related to induced collapse of soil would be less than significant.**

St. Luke's Campus with Alternate Emergency Department Location Variant: This project variant would not reduce or eliminate the dewatering impacts associated with construction of the MOB/Expansion Building, and thus would not affect the risk of subsidence at the St. Luke's Campus or the susceptibility of soils on the campus to collapse. Therefore, for the same reasons as described above, **the impact related to ground subsidence would be potentially significant and the impact related to induced collapse of soil would be less than significant**.

St. Luke's Campus with Cesar Chavez Street Utility Line Alignment Variant: Excavation for the sewer variant location (along Duncan Street) is anticipated to extend 1–7 feet below groundwater level.[146] This would require more dewatering than required for the proposed near-term projects at the St. Luke's Campus. For the same

[146] California Pacific Medical Center (Sutter Health/CPMC). 2010 (February 26). *Geology and Geotechnical Input for Environmental Impact Report, Sewer Relocation, Alternative Route 2, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 4.

reasons as described previously, **the impact related to ground subsidence would be potentially significant and the impact related to induced soil collapse would be less than significant**.

Mitigation Measure for St. Luke's Campus

M-GE-N6 The design-level geotechnical report for the MOB/Expansion Building, the proposed utility route, and the sewer variant at the St. Luke's Campus shall include an excavation and dewatering program. The program shall include measures to monitor the improvements adjacent to construction for vertical movement. The monitoring shall include an optical survey and installation of inclinometers and groundwater observation wells. Groundwater levels outside the excavation shall be monitored through wells while dewatering is in progress. Should the magnitude of settlement or groundwater drawdown be deemed potentially damaging to surrounding improvements by a licensed engineer, the groundwater outside the excavation shall be recharged through wells or the dewatering program altered to reduce drawdown to an acceptable level.

Implementing Mitigation Measure M-GE-N6 at the St. Luke's Campus would reduce the impact related to subsidence to a less-than-significant level because it would prevent significant subsidence impacts through monitoring of surrounding improvements during dewatering activities and would require the immediate recharge or alteration of dewatering activities to halt settlement, should it occur.

Long-Term Projects

◆ Pacific and Davies Campuses

San Francisco has no agricultural land uses and no petroleum wells are located within the city limits. The City pumps groundwater from within the city limits for landscape irrigation at the Harding Park Golf Course, San Francisco Zoo, and Golden Gate Park. The City's proposed Groundwater Supply Project includes plans for six new wells in the western part of the city to operate in 2013, with total pumping of up 4 million gallons per day. However, the Pacific and Davies Campuses are located in separate groundwater basins from those used by the existing and proposed new wells; thus, campus groundwater would not be affected by those ongoing or planned groundwater extractions. As discussed in the descriptions of soil and groundwater conditions for the Pacific and Davies Campuses on pages 4.14-11 and 4.14-12, subsurface exploration at the locations of the proposed ACC building, ACC Addition, Webster Street/Sacramento Street Underground Parking Garage, and North-of-Clay Aboveground Parking Garage at the Pacific Campus and Castro Street/14th Street MOB at the Davies Campus did not reveal soft, compressible sediments that would be susceptible to subsidence. Accordingly, the risk of ground subsidence at the Pacific and Davies Campuses would be low, and project construction would not induce ground subsidence at adjacent streets and properties.

Excavation activities during construction of the proposed structures at the Pacific Campus may encounter groundwater, which would require dewatering. Long-term dewatering is not anticipated to be required for the proposed developments. Removing large amounts of water from the water table during construction dewatering has the potential to result in subsidence as overlying soil loses support from the volume of the water. The geotechnical reports for the Pacific Campus determined that the soil in the location of the proposed structures is primarily dense sand and bedrock and the groundwater level is relatively deep. Therefore, anticipated settlement would not be expected to exceed one-quarter inch, and subsidence would not present a hazard to the proposed ACC building, ACC Addition, Webster Street/Sacramento Street Underground Parking Garage, or North-of-Clay Aboveground Parking Garage.[147] Because construction dewatering would not be expected to result in subsidence at those campus sites, it similarly would not be expected to indirectly induce ground subsidence at adjacent streets and properties. Groundwater dewatering during construction is not anticipated to be required for the Castro Street/14th Street MOB. In addition, Improvement measure I-GE-L6 would ensure development of an excavation monitoring program for excavation for long-term LRDP projects at the Pacific and Davies Campuses to detail procedures for monitoring of dewatering activities. Accordingly, **the impact related to subsidence would be less than significant**.

The soil beneath the locations of the proposed ACC building, ACC Addition, Webster Street/Sacramento Street Underground Parking Garage, and North-of-Clay Aboveground Parking Garage at the Pacific Campus was determined by the geotechnical investigations to generally consist of stiff clay and dense to very dense sand materials. The soil beneath the location of the Castro Street/14th Street MOB at the Davies Campus was determined to consist of medium dense to dense sandy clay. The relative densities of the soils do not indicate a susceptibility to collapse and the potential for soil collapse at the sites would be low. Because the potential for the proposed developments to induce soil collapse on-site is low, the potential to indirectly induce soil collapse on adjacent streets and properties is low. Accordingly, **the impact related to collapse would be less than significant**.

Improvement Measure for the Pacific and Davies Campuses (long term)

I-GE-L6 This improvement measure is identical to Improvement Measure I-GE-N6, above.

For the same reasons as described above, **implementing Improvement Measure I-GE-L6 at the Pacific and Davies Campuses in the long term would further reduce the less-than-significant Impact GE-6** by ensuring that unanticipated effects of dewatering activities are monitored.

[147] California Pacific Medical Center. 2010. *Mitigation Measures Regarding Geologic and Geotechnical Impacts, CPMC Long Range Development Plan, San Francisco, CA*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA. Page 5.

IMPACT GE-7

The project would not be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code, nor would it be substantially affected by corrosive soils, and therefore would not create substantial risks to life or property. (Significance Criterion 14d)

Levels of Significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

Geotechnical investigations and laboratory testing of the soil were conducted beneath the locations of the proposed Cathedral Hill Hospital and Cathedral Hill MOB at the proposed Cathedral Hill Campus, the Neuroscience Institute building at the Davies Campus, and the St. Luke's Replacement Hospital and MOB/Expansion Building at the St. Luke's Campus. The results determined that the probability of expansion of the sediment beneath the Cathedral Hill and Davies Campuses is low.[148, 149, 150] Given the proximity and similar nature of the soil beneath the location of the Van Ness Avenue pedestrian tunnel to that beneath the hospital and MOB sites, it is likely that the probability of sediment expansion at the location of the tunnel is also low. However, geotechnical investigation at the St. Luke's Campus indicated the presence of potentially expansive clayey fill and topsoil in the northern portion of the St. Luke's Campus, in the vicinity of the proposed St. Luke's Replacement Hospital, MOB/Expansion Building, and northeasternmost portion of the proposed utility route (the intersection of Cesar Chavez Street and San Jose Avenue). However, the potentially expansive material is confined to the upper 16 feet of the subsurface soil profile. Excavation for the replacement hospital would extend to 17 feet below ground surface except at the northeast corner of the building. The northeast corner of the

[148] California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[149] California Pacific Medical Center (Sutter Health/CPMC). 2009. *Updated Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[150] California Pacific Medical Center. 2006. *Geotechnical Investigation, Four Campus Master Plan Project, Pacific Campus, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

proposed St. Luke's Replacement Hospital would be structurally supported in competent subsurface soil material below the fill/topsoil in accordance with the recommendations of the geotechnical investigation. Excavation for the MOB/Expansion Building would extend to 50 feet below ground surface to competent native soil. Excavation for the proposed sewer route would extend to 28 feet below ground surface. Therefore, **the impact related to expansive soil would be less than significant**.

Additional laboratory testing for corrosivity was conducted on the soils at the proposed Cathedral Hill Campus and the Davies and St. Luke's Campuses. Results indicated that deeper soils at the proposed Cathedral Hill Campus are considered "moderately corrosive" while upper surface soils are considered "mildly corrosive."[151, 152] As with the expansion potential, the proximity and similar nature of the soil beneath the location of the Van Ness Avenue pedestrian tunnel mean that it is likely the soil beneath the tunnel is also mildly corrosive. No corrosivity testing was conducted on the Davies Campus at the location of the proposed Neuroscience Institute building; however, given the similar nature of the subsurface soil materials at the site to the other campuses, it is likely that the soil beneath the campus would be on the scale of "negligibly corrosive" to "moderately corrosive." Corrosion testing at the St. Luke's Campus indicated that soils at the campus are considered "moderately corrosive" to "mildly corrosive."[153] Subsurface concrete and reactive metal materials could be corroded through contact with soils over time. However, as part of standard engineering practices, all reinforced concrete, including foundations and floor slabs, buried iron, steel, cast iron, ductile iron, galvanized steel, dielectric coated steel or iron, and buried metallic pressure piping, would be properly protected against corrosion in accordance with the critical nature of the structure. Therefore, **the impact related to corrosive soil would be less than significant**.

Cathedral Hill Campus and St. Luke's Campus with Project Variants: The respective variants would not affect the probability of soil expansion or the corrosivity of soils at the campus sites, relative to the near-term projects for these campuses as proposed. Therefore, for the same reasons as discussed above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, or St. Luke's Campuses in the near term.

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[151] California Pacific Medical Center. 2004 (September 30). *Geotechnical Investigation and Geologic Hazard Evaluation, Cathedral Hill Hospital, California Pacific Medical Center, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[152] California Pacific Medical Center (Sutter Health/CPMC). 2009. *Updated Geotechnical Investigation Report, Cathedral Hill Medical Office Building, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[153] Gilpin Geosciences. 2008 (December 12). *Geologic Hazard Investigation, St. Luke's Medical Center, San Francisco, California.* San Rafael, CA. Prepared for Treadwell & Rollo, San Francisco. Appendix A in: California Pacific Medical Center (Sutter Health FPD). 2008 (December 19). *Geologic Hazard Evaluation and Geotechnical Investigation, St. Luke's Replacement Hospital, San Francisco, California*. San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

Long-Term Projects

◆ Pacific and Davies Campuses

The design plans for the proposed ACC building, ACC Addition, Webster Street/Sacramento Street Underground Parking Garage, and North-of-Clay Aboveground Parking Garage at the Pacific Campus and Castro Street/14th Street MOB at the Davies Campus have not been finalized, and the analysis of potential impacts at the campus remains at a programmatic level. However, the subsurface materials at the campuses would not change between the time of the investigation and implementation of the long-term projects. The results of the geotechnical investigations and laboratory testing of the soil beneath the Pacific and Davies Campuses determined that the probability of soil expansion beneath the site is low.[154, 155] Therefore, **the impact related to expansive soils would be less than significant**.

Additional laboratory testing for corrosivity was conducted on the soils at the Pacific Campus. Soils in the locations of the proposed ACC building, ACC Addition, Webster Street/Sacramento Street Underground Parking Garage, and North-of-Clay Aboveground Parking Garage were found to be "moderately corrosive" to "negligibly corrosive." As discussed above for the near-term impacts, no corrosivity testing was conducted at the Davies Campus; however, because the site's subsurface materials are similar to those at other campuses, the soil beneath the campus would likely be "negligibly corrosive" to "moderately corrosive." Because the soils at the Pacific and Davies Campuses are corrosive, subsurface concrete and reactive metal materials could be corroded through contact with soils over time. However, as part of standard engineering practices, all reinforced concrete, including foundations and floor slabs, buried iron, steel, cast iron, ductile iron, galvanized steel, dielectric coated steel or iron, and buried metallic pressure piping would be properly protected against corrosion in accordance with the critical nature of the structure. Therefore, **the impact related to corrosive soils would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific or Davies Campuses in the long term.

[154] California Pacific Medical Center. 2006. *Geotechnical Investigation, Four Campus Master Plan Project, Pacific Campus, California Pacific Medical Center, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

[155] California Pacific Medical Center (Sutter Health). 2009 (March 19). *Geotechnical Investigation, Castro/14th Streets Medical Office Building and 14th/Noe Streets Temporary Parking Garage CPMC—Davies Campus, San Francisco, California.* San Francisco, CA. Prepared by Treadwell & Rollo, San Francisco, CA.

IMPACT GE-8 *The CPMC campus sites do not have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater. (Significance Criterion 14e)*

Levels of Significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

The proposed CPMC LRDP would not include septic tanks or alternative wastewater disposal systems at any campus. All existing campuses connect into the municipal combined stormwater/sewer system and would remain connected; as discussed in Section 4.12, "Utilities and Service Systems," the proposed Cathedral Hill Hospital and Cathedral Hill MOB and the Neuroscience Institute building at the Davies Campus would be designed and constructed to connect to the municipal combined stormwater/sewer system. Construction work proposed for the St. Luke's Campus would require realignment of the existing stormwater/sewer line. However, after the relocation of the line, the site would be reconnected into the municipal sewer system and no septic tanks would be required. **This impact would be less than significant.**

Cathedral Hill Campus and St. Luke's Campus with Project Variants: The project variants at these campuses would not affect the connections to the municipal sewer system. Proposed structures at both campuses under all variants would connect into the municipal combined stormwater/sewer system and no septic tanks would be required. Therefore, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, or St. Luke's Campus in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

This long-term impact is identical to the near-term impact identified above for the Cathedral Hill, Davies, and St. Luke's Campuses. For the same reasons as discussed above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific Campus or Davies Campus in the long term.

IMPACT GE-9

The project would not change substantially the topography or any unique geologic or physical features of the sites. (Significance Criterion 14f)

Levels of Significance:

- *Cathedral Hill (with or without project variant): Less than significant*
- *Pacific: Less than significant*
- *Davies (near term and long term): Less than significant*
- *St. Luke's (with or without either project variant): Less than significant*

Near-Term Projects

◆ Cathedral Hill, Davies, and St. Luke's Campuses

As discussed under "Erosion" in Section 4.14.1, "Environmental Setting" (page 4.14-1), the CPMC campus sites are almost entirely developed with buildings, paved parking lots, or landscaped areas. Although the CPMC campuses are located on sites with elevation changes, there are no unique geologic features, such as prominent hills, exceptional rock outcroppings, or similar features. Near-term projects at the Cathedral Hill, Davies, and St. Luke's Campuses under the proposed LRDP would alter surface topography and require the excavation and disposal of approximately 290,900 cubic yards of soil. The greatest excavation of soil would occur at the site of the proposed Cathedral Hill Campus, where the existing subsurface topographic profile would be deepened by removing 122,000 cubic yards at the Cathedral Hill Hospital site and 92,000 cubic yards at the Cathedral Hill MOB site. At the site of the proposed Cathedral Hill Hospital, the cut into the hillside would be located entirely within the site boundary. The excavation would deepen the existing cut into the hillside that is currently occupied by the Cathedral Hill Hotel. The proposed cut would create a maximum cut slope that's 64 feet deep along the western side of the site at Post and Franklin Streets. Because of the slope of the hillside, the sides of the cut below grade would drop to 23 feet deep along the east side of the Cathedral Hill Hospital site at Van Ness Avenue and

Geary Boulevard. At the Cathedral Hill MOB site, the cut into the hillside would extend across the full site and would reach a maximum of 79 feet deep at the Van Ness Avenue and Cedar Street side of the Cathedral Hill MOB site. Because of the grade of the hillside, the height of the cut would drop to 55 feet below existing grade along Geary Street and the eastern edge of the Cathedral Hill MOB site. About 1,700 cubic yards of soil would be removed for construction of the tunnel under Van Ness Avenue. A temporary cut would be made that is 23 feet deep below Van Ness Avenue, but the area above the tunnel would be refilled, and thus, no permanent alteration of the surface topography would result.

The proposed soil excavation at the Davies Campus for the Neuroscience Institute would entail removing 6,000 cubic yards of soil on the gently sloping site. The proposed cut into the hillside would occupy the full footprint of the proposed building to accommodate the foundation and would reach a maximum cut slope that is 6 feet below the existing grade.

At the St. Luke’s Campus, 42,000 cubic yards of soil would be excavated for the MOB/Expansion Building (including the below-grade garage), 19,400 cubic yards of soil would be removed for the St. Luke’s Replacement Hospital, and 7,800 cubic yards of soil would be excavated for the proposed utilities route. At the MOB/Expansion building site, the cut would extend under the footprint of the building as well as to the area on the immediate south side of the building. The maximum cut would extend 17 feet below the existing grade at the southwest corner of the site to accommodate the below-grade parking facility. At the St. Luke’s Replacement Hospital site, the cut would extend under the building to varying depth, with a maximum cut slope of 16 feet below grade along 27th Street to grade level (no cut) along Cesar Chavez Street.

The foundations and subsurface levels of the proposed buildings at each campus would entirely occupy the excavated areas; thus, the change in topography resulting from the proposed cuts would not be visible. The development at the campuses would not change site topography in off-site areas, and no substantial change in grade of the surrounding vicinity would occur. Accordingly, although the amount of native soil and rock removed for below-grade excavation would be substantial, the change in topography would be entirely below grade and would not be visible. Additionally, no unique geologic features, such as rock outcroppings and notable hills, are present at any of the campuses, and thus, none would be affected by the LRDP. **This impact would be less than significant**.

Cathedral Hill Campus with No Van Ness Avenue Pedestrian Tunnel Variant: Because the Van Ness Avenue pedestrian tunnel would not be constructed, slightly less construction would be required with this project variant than under the near-term projects as proposed. Therefore, no new effects on topography would occur. For the same reasons as discussed above, **this impact would be less than significant**.

St. Luke's Campus with Alternate Emergency Department Location Variant: The amount of construction required with implementation of this project variant would be the same as for the near-term projects as proposed. Therefore, no new effects on topography would occur. For the same reasons as discussed above, **this impact would be less than significant**.

St. Luke's Campus with Cesar Chavez Street Utility Line Alignment Variant: A larger amount of construction would be required with implementation of this project variant than under the near-term projects as proposed. However, the additional excavation would be along public streets, which do not contain unique geologic features. Therefore, no new effects on topography would occur with implementation of this project variant. For the same reasons as discussed above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Cathedral Hill, Davies, or St. Luke's Campus in the near term.

Long-Term Projects

◆ Pacific and Davies Campuses

This long-term impact is similar to the near-term impact identified above for the near-term projects. Long-term projects under the proposed LRDP would alter surface topography and require the excavation and disposal of an estimated 155,000 cubic yards of soil. Excavation of the underground parking beneath the proposed ACC Addition at the Pacific Campus would require the excavation of an estimated 92,000 cubic yards of soil; however, excavation for the proposed North-of-Clay Aboveground Parking Garage would require minimal excavation. Excavation associated with the construction of the Castro Street/14th Street MOB would require the removal of approximately 63,000 cubic yards of soil. As with the near-term projects, although the amount of native soil and rock removed for below-grade excavation would be substantial, the change in topography would be entirely below grade and would not be visible. No additional analysis of potential impacts on geologic features would be required for long-term projects. For the same reasons as discussed above, **this impact would be less than significant**.

Mitigation Measure: No mitigation or improvement measures are required at the Pacific Campus or Davies Campus in the long term.

4.14.6 Cumulative Impacts

Impacts associated with potential geologic hazards related to fault rupture could occur at individual sites on the CPMC campuses and would be related to the site's location relative to fault zones, the composition of the site's soil, and the structural strength of a particular building. None of the CPMC campuses are in an Alquist-Priolo fault zone, and no known active faults cross the sites, making hazards from fault rupture from other nearby sites unlikely. Development at the CPMC campuses would not increase or decrease the risks of fault rupture at any location individually or cumulatively with other cumulative projects. **Cumulative impacts with regard to fault rupture would not be considerable**.

Impacts associated with potential ground shaking would occur at individual sites on the CPMC campuses. These effects are site specific, and impacts would not be compounded by additional development. In common with the rest of California, San Francisco is in a seismically active area and is subject to risk of damage to persons and property as a result of seismic ground shaking. Buildings in California are strictly regulated by the CBC, as adopted and enforced by each jurisdiction, to reduce risks from seismic events to the maximum extent possible. New buildings and facilities in San Francisco must be sited and designed in accordance with appropriate geotechnical and seismic guidelines and recommendations, consistent with the requirements of the SFBC and the Alquist-Priolo Act. Cumulative future development in the project area would be subject to design review and safety measures similar to those for the CPMC LRDP. Therefore, although risk from seismic events is inherent in all development in seismically active areas in California, compliance with applicable regulations would reduce this risk.

The CPMC LRDP would comply with the SFBC, San Francisco Department of Public Works regulations, the California Seismic Hazards Mapping Act, and other agency specifications for new structures. Additionally, the acute-care hospitals proposed for the Cathedral Hill and St. Luke's Campuses would be subject to OSHPD requirements, and one of the objectives of the LRDP is to comply with the seismic requirements of SB 1661 and SB 1953. These regulations have been formulated to preserve public safety.

Because development of the CPMC campuses would comply with the provisions of all applicable codes and regulations and because its building plans would conform to the most current seismic safety design guidelines, **the LRDP would not make a cumulatively considerable contribution to any potential cumulative impacts arising out of strong seismic ground shaking**.

As with impacts related to seismic ground shaking, the geographic context for analysis of impacts on development from unstable soil conditions (landslides, liquefaction, subsidence, collapse, or expansive or corrosive soils) generally is site specific. All development is required to undergo analysis of geological and soil conditions applicable to the specific project; restrictions on development would be applied if geological or soil conditions pose a risk to safety. Because the City uses and enforces the requirements of the CBC as part of the SFBC, new buildings and facilities in San Francisco must be sited and designed in accordance with the most current geotechnical and seismic guidelines and recommendations. This would apply to all pertinent cumulative development in the vicinity of the LRDP projects. In addition, CPMC would implement all necessary mitigation measures for the near-term and long-term projects to reduce the risk from liquefaction, settlement, lateral spreading, corrosive soils, subsidence, and landslides.

With implementation of the previously noted mitigation measures and adherence to the SFBC and related plans, regulations, and design and engineering guidelines and practices, **the CPMC LRDP would not make a cumulatively considerable contribution to any potential cumulative impact arising from liquefaction, settlement, lateral spreading, corrosive soils, or landsliding**.

Implementing the LRDP would modify soil and topographic conditions at the CPMC campuses to accommodate development and provide a stable and safe physical environment. The construction phase of the projects could expose soil to erosion by wind or water. Development of other foreseeable cumulative projects in the vicinity of the campuses (see page 4.1-35 in Section 4.1, “Land Use and Planning,” for details) could expose soil surfaces and further alter soil conditions. The impacts of erosion and loss of topsoil from site development and operation can be cumulative in effect within a watershed. Development throughout San Francisco is subject to runoff, erosion, and sedimentation prevention requirements, including the applicable provisions of Phases I and II of the National Pollutant Discharge Elimination System permit process and implementation of fugitive dust control measures in accordance with Bay Area Air Quality Management District Rule 403. Construction activities would be required to comply with all code requirements, including surface soil erosion control. Any erosion potential would be reduced or avoided through compliance with applicable codes and mitigation measures. Because all development in the watershed would be subject to these provisions, **cumulative impacts related to erosion or the loss of topsoil would not be considerable**.

As with seismic ground-shaking impacts, the geographic context for analysis of impacts on development from unstable soil conditions, including landslides, liquefaction, subsidence, collapse, or expansive or corrosive soils, generally is site specific. All development must undergo analysis of geological and soil conditions applicable to the specific individual project, and restrictions on development would be applied if geological or soil conditions pose a risk to safety; therefore, it is anticipated that cumulative impacts from development on soils subject to instability, subsidence, collapse, and/or expansive soil would be less than significant. Because CPMC would implement the identified mitigation measures, **the LRDP would not make a cumulatively considerable contribution to any potential cumulative impacts, and the cumulative impact of the LRDP would be less than significant**.

Cumulative projects, depending on where they are located, could substantially change site topography and/or unique geologic or physical features at their respective sites. In certain situations this could be a potentially significant impact, particularly if a large number of cumulative projects were to change topography or unique geologic features. Although the CPMC campuses are located on sites with elevation changes, there are no unique geologic features, such as prominent hills, exceptional rock outcroppings, or similar features. The LRDP would alter surface topography for new development; however, development at the campuses would not substantially change site topography or affect unique geologic features. Therefore, **no cumulative impact related to topography and unique geographic features would occur**.

The proposed excavation of a combined total of approximately 445,900 cubic yards of soil for the LRDP would be added to an unknown, but potentially large amount of excavated soil from cumulative development. The excavated soil from most of the developments in San Francisco must be disposed off-site. Topography and surrounding development generally limit the possibility of balancing cut and fill on CPMC's campuses and on other development sites in the city, and the resulting spoils must be disposed off-site. As required by Mitigation Measure HZ-N1a on page 4.16-46 in Section 4.16, "Hazards and Hazardous Materials," excavated soil would be sampled before off-site disposal to determine the appropriate disposal site. For the LRDP, agreements between the construction contractors and Brisbane Baylands Landfill, a former landfill that has been accepting clean soil for use as fill since 1967, are currently being prepared for the disposal of soil determined to be uncontaminated by the analytical sampling. Because the Brisbane Landfill is a permitted facility, disposal of the spoils would be in compliance with its permit conditions, thus ensuring that the material would be placed using engineered methods to ensure that the fill would be stable, would not erode, and would not have unacceptable drainage. Cumulative development likely would require additional off-site disposal of spoil materials at sites that remain to be identified. It is assumed that multiple disposal sites permitted to accept such material would be used by the cumulative developments. Therefore**, cumulative impacts related to the off-site disposal of excavated materials would be less than significant.**

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