University of California

The University of California Sustainable Practices Policy

The University of California (UC) Sustainable Practices Policy lays out sustainability goals and strategies for all UC campuses and medical centers and covers climate and energy, transportation, water, green building, waste, food, and operations. UC has a goal to reach operational carbon neutrality by 2025. As a part of that goal, UC recognizes that single-occupant vehicle (SOV) commuting is a primary contributor to commute GHG emissions and localized transportation impacts, and has set the following goals related to transportation:

- By 2025, each location shall strive to reduce its percentage of employees and students commuting by SOV by 10 percent relative to its 2015 SOV commute rates.
- By 2050, each location shall strive to have no more 40 percent of its employees and no more than 30 percent of all employees and students commuting to the location by SOV.
- By 2025, each location shall strive to have at least 4.5 percent of commuter vehicles be zero-emission vehicles (ZEV).
- By 2050, each location shall strive to have at least 30 percent of commuter vehicles be ZEV.
- Each location (campus) will develop a business-case analysis for any proposed parking structures serving University affiliates or visitors to campus to document how a capital investment in parking aligns with each campus' Climate Action Plans and/or sustainable transportation policies.

UCSF Long Range Development Plan

Each campus within the University of California system is required periodically to prepare a Long Range Development Plan (LRDP), which sets forth concepts, principles, and plans intended to guide future physical growth of the campus. Currently, development at all UCSF campus sites is guided by the *2014 UCSF Long Range Development Plan (2014 LRDP)*, which includes specific policies related to future program development and space needs at each UCSF campus site, including the Parnassus Heights campus site.

The 2014 LRDP identified campus-wide objectives and objectives specific to the Parnassus Heights campus site. The following 2014 LRDP objectives relate to transportation goals:

LRDP Objectives

1. **Respond to the City and Community Context**

   D. Incorporate pedestrian-friendly urban design principles to relate campus buildings to surrounding streetscape and neighborhoods.

4. **Promote Environmental Sustainability**

   B. Reduce commute travel by providing additional campus housing.

   C. Reduce the number of UCSF remote locations by consolidation of owned and leased sites, thereby reducing travel between sites.

D. Enhance the Transportation Demand Management program by developing adequate facilities and transportation demand reduction policies, to emphasize transportation alternatives that will lessen auto traffic in and around campus sites and to meet changing needs consistent with the City's Transit First policy.

E. Continue to prioritize scarce parking for use by patients and essential healthcare providers.

The 2014 LRDP also included *Community Planning Principles*, which were produced in collaboration with the UCSF Community Advisory Group:

Community Planning Principles

Transportation

T1. Coordinate with relevant agencies to minimize congestion and provide viable transportation alternatives to single-occupancy vehicles.

T2. Coordinate UCSF planning and development efforts with San Francisco Municipal Transportation Agency operations within and around campus sites.

T3. Remain committed to San Francisco's Transit First policy and appropriate transportation demand management strategies.

T4. Recognizing UCSF's position as the second largest employer in San Francisco, take a leadership position to advance San Francisco's Transit First policy and to advocate for sustainable transportation solutions including increase in public transit ridership, use of alternative fuel vehicles, traffic calming measures, transportation demand management, demand pricing, off-peak delivery of goods and services, smart phone technologies, and other innovative strategies.

T5. Take into account transportation impacts at both the neighborhood and citywide levels in planning for UCSF's facilities.

T6. Avoid building parking in excess of anticipated need.

City of San Francisco

Transit First Policy

The City's Transit First policy is a set of principles that emphasize the City's commitment to give pedestrian, bicyclist, and public transit use of public rights-of-way priority over the private automobile.

Better Streets Plan

The Better Streets Plan is a unified set of standards, guidelines, and implementation strategies to govern how San Francisco designs, builds, and maintains its pedestrian environment, which it defines as the areas of the street where people walk, sit, shop, play, or interact. The Better Streets Plan focuses on creating a positive pedestrian environment through measures such as careful streetscape design and traffic calming measures to increase pedestrian safety. Generally speaking,

the guidelines are for design of sidewalks and crosswalks; however, in some cases, the Better Streets Plan includes guidelines for certain areas of the roadway, particularly at intersections.

San Francisco Bicycle Strategy

The San Francisco Bicycle Strategy describes a City program to provide the safe and attractive environment needed to promote bicycling as a transportation mode. The Bicycle Strategy identifies the citywide bicycle route network and establishes the level of treatment (i.e., Class I, Class II or Class III facility) for each route.

4.15.3 Impacts and Mitigation Measures

This section provides the impact analysis related to transportation for the proposed project. It describes the methods used to determine the impacts of the proposed project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany the discussion of each identified significant impact, as needed.

Significance Criteria

Would implementation of the CPHP, including the three Initial Phase projects and Initial Phase improvements:

a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

b) Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?[13]

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

d) Result in inadequate emergency access?

e) Would project construction activities adversely affect travel conditions along sidewalks and roadways serving the project site?

Approach to Analysis

Consistent with the CEQA Guidelines and the *SF Guidelines*, the transportation impact analysis in this EIR analyzes the change to VMT that would result from the implementation of the CPHP at the Parnassus Heights campus site. Changes to traffic operations in the study area (i.e., the level of service of project area intersections) and transit operations (e.g. project generated transit ridership and effect on capacity utilization, potential delay to transit vehicles) is outside the scope of the CEQA analysis and are not discussed below. An analysis of the changes to traffic and

[13] CEQA Guidelines Section 15064.3, subdivision (b) refers to the discontinuation of vehicle level of service (LOS) as an impact metric for transportation analysis and instead recommends the use of vehicle miles traveled (VMT); this section gives lead agencies discretion to choose the most appropriate methodology to evaluate a project's VMT.

transit operations has, however, been completed and is presented in **Appendix TRANS** for informational purposes only. This appendix is provided for decision-makers' consideration, independent of the environmental review process.

As discussed in the Vehicle Miles Traveled section above (within the *Local Setting* section), VMT is a measurement of the amount and distance that a resident, employee, or visitor drives, accounting for the number of passengers within a vehicle. To determine VMT, travel demand was first estimated to understand the number and the length of vehicle trips associated with the CPHP by population.

At a high level, travel demand is determined through the use of a four-step process: trip generation, mode split, trip distribution, and trip assignment, which are described in more detail in the Travel Demand Estimates section. The travel demand estimates for the CPHP were primarily informed by the results of travel behavior surveys conducted at the campus site in recent years, but with two adjustments to reflect how people are reasonably expected to travel in the future with the implementation of the CPHP: (1) current travel behavior trends such as more people traveling to and from the campus site using TNCs such as Uber and Lyft, and (2) the expected amount of parking available to UCSF faculty, staff, patients, and visitors under the CPHP, which would be more constrained than existing conditions and would result in a shift away from driving alone and parking on campus. The campus off-street parking supply is expected to decrease by approximately 400 spaces with implementation of the CPHP from approximately 2,300 spaces to approximately 1,900 spaces.[14]

Analysis Scenarios

The analysis examines four scenarios: 'Existing', 'CPHP' (Future Phase), 'CPHP Initial Phase' and 'Cumulative.' Each scenario is described below.

- **Existing** – This scenario represents existing conditions at the campus site and is based on existing population numbers and existing travel behavior.
- **CPHP (Future Phase)** – This scenario represents full buildout, when the CPHP has been fully implemented. This analysis uses the projected future campus population and adjusted mode split numbers.
- **CPHP Initial Phase** – This scenario represents the implementation of the near-term projects proposed in the Initial Phase, which are anticipated to be completed by about the year 2030. This includes the Irving Street Arrival, Research and Academic Building, and initial Aldea Housing Densification projects and other Initial Phase improvements (e.g., Initial Phase Utility Improvements, the Parnassus Avenue Streetscape Plan, Renovation of Existing Buildings, and Neighborhood Investments (see Chapter 3, *Project Description* for more detail). Note: as described in Chapter 3, *Project Description*, the New Hospital is also an Initial Phase project, but is analyzed at a program level in this EIR. The New Hospital will be analyzed in more detail – at a project level – in a future, separate EIR.

[14] These estimates include garage and surface lots at the campus site, including the Kezar lot, and exclude parking associated with the Aldea Housing complex.

- **Cumulative** – The Cumulative scenario represents implementation of the CPHP in combination with past, present, and reasonably foreseeable future projects in the vicinity of the campus site.

Travel Demand Estimates

Trip Generation

UCSF provided population estimates for faculty and staff, patients and visitors, and residents under the CPHP in August 2019. Trip generation rates for the populations were based on historical UCSF travel surveys and largely consistent with the Transportation Impact Study prepared in support of the 2014 LRDP. These trip generation inputs were used in combination with the population estimates by category to estimate daily and PM peak hour person trips by population category at full implementation of the CPHP. Daily and peak hour person trip estimates by population group are displayed in **Table 4.15-7.** Compared to existing conditions, the daily population and daily and PM peak hour external person trips are expected to increase by approximately 50 percent.

TABLE 4.15-7
CPHP (FUTURE PHASE)[1] DAILY AND PEAK HOUR PERSON TRIPS (COMPARED TO EXISTING CONDITIONS)

Population Group	Population	External Daily Person Trips	External PM Peak Person Trips
Faculty/Staff/Students	16,400[2]	29,700	5,200
Patients/Visitors	9,000	18,100	1,300
Residents[3]	1,000[4]	4,400	600
Total[5]	**26,400**[6] (+50%)	**52,200** (+55%)	**7,100** (+50%)

NOTES:
1 The population and trip estimates reflect full buildout of the CPHP (Future Phase), when the CPHP has been fully implemented.
2 For purposes of the transportation analysis, sub-population estimates (e.g. faculty, staff, and student populations individually) were rounded prior to summing; this results in a difference of approximately 100 compared to the total population presented in Chapter 3, *Project Description*.
3 includes staff and student housing, market-rate housing, and hotel for patients and families proposed as part of the CPHP.
4 The trip generation estimates for the market-rate housing and hotel uses are based on the number and size of housing units and number of hotel rooms. The population associated with these uses is not included in this population estimate. However, these uses are included in the person trip estimates and the subsequent demand analyses presented below.
5 Percentages represent the percent change from the existing condition to full buildout of the CPHP.
6 The total population analyzed in the transportation analysis differs from the total population presented in Chapter 3, *Project Description*, because it includes residents.

The Parnassus Heights campus site is estimated to generate a total of approximately 52,200 external daily person trips with full implementation of the CPHP by year 2050, an increase of approximately 55 percent compared to existing conditions. This number of trips excludes internal trips that are expected to occur within the campus site (e.g., a researcher at the campus site traveling from her office to the Millberry Union to eat lunch and returning back to her office afterwards).

Mode Choice

Mode choice is the designation of trips to the various means that people use to travel, such as automobile, transit, walking, bicycling, taxi, or other modes of transportation. The determination

of the mode of transportation used in trips to and from the campus site would depend on many characteristics of the trip such as who is making the trip (e.g., faculty, staff, patient, visitor, resident, vendor), the type of trip (work, medical appointment, other visit), and where people are going to or coming from. Existing mode choice data was derived from the 2018 Employee Commute Survey and the 2017-18 Patient/Visitor Survey and is displayed in **Table 4.15-8**.

TABLE 4.15-8
EXISTING MODE SPLIT (2018)

Population Group	Drive Alone	Drop-Off	Taxi/ Uber/ Lyft	Car-pool	Van-pool	Public Transit	UCSF Shuttle	Bicycle	Motor-cycle/ Scooter	Walk/ Run	Tele-com-mute	Other
Faculty/ Staff/ Students	23%	2%	4%	3%	1%	32%	10%	6%	1%	16%	2%	0%
Patient/ Visitor	22%	7%	7%	37%[1]	1%	17%	3%	1%	0%	5%	0%	0%
Residents	31%	3%	2%	0%	0%	25%	25%	4%	0%	9%	0%	0%

NOTES:
[1] Surveyed patients and visitors who "traveled in a car with others" on their trip to/from the campus site are categorized under "carpool." The larger proportion of carpooling activity among patients and visitors reflects the proportion of patients (both inpatients and outpatients) who travel to/from the campus site with a companion.

To forecast anticipated travel behavior under full buildout of the CPHP, which would be completed by 2050, a methodology was developed to adjust the existing mode split to account for:

- The continuation of observed historical travel behavior trends, such as a decrease in faculty/staff drive alone trips, an increase in faculty/staff transit use and an increase in TNC and drop-off trips associated with both faculty/staff and patients/visitors
- The anticipated amount of parking provided under the CPHP for faculty/staff and patients/visitors, which would essentially "cap" the number of drive alone and carpool trips to/from campus across both the faculty/staff and patient/visitor populations

To estimate how travel patterns might change in the future, current trends in travel behavior at UCSF were first examined. In recent years, UCSF has continued implementing an extensive TDM program, prices for off-street parking have increased, and some minor transit improvements have been implemented on nearby routes. Based on regularly conducted surveys of UCSF faculty and staff travel behavior, the share of faculty and staff driving alone to campus decreased from 32 to 23 percent between 2013 and 2018. During the same period, the share of faculty and staff traveling by public transit or UCSF shuttle increased from 37 to 42 percent and the percentage of faculty and staff traveling by taxi/TNC or drop-off increased from 4 to 6 percent. Over the past 30 years, UCSF patient and visitors have been surveyed on their travel behavior twice – in 1990 and 2018. During that time period, the share of patients and visitors driving alone to campus decreased from 39 to 22 percent and the share traveling by public transit or UCSF shuttle decreased from 33 percent to 20 percent. During the same period, the share traveling by taxi, TNC, drop-off or carpool increased from 22 percent to 51 percent.

Even if these travel behavior trends continue into the future – and less faculty and staff drive alone and more travel by public transit and/or taxi/TNC – the amount of parking available at UCSF under the CPHP would not be sufficient to accommodate the number of people who would desire to drive alone or carpool to the campus site.

Under the CPHP, the amount of off-street parking available is expected to decrease by approximately 400 parking stalls from approximately 2,300 to approximately 1,900 parking stalls in off-street garages and surface lots.[15] Total parking supply would decrease even with the addition of a new structured parking garage proposed as part of the West Side Housing. A new structured parking garage with approximately 190 parking spaces would replace the Westside surface lot behind the Dental Clinics building (with 151 existing parking spaces).

As the total campus population increases in a more parking-constrained environment, people will likely change the way they travel to and from the campus site. With respect to patients, some health insurance companies and hospitals are currently partnering with TNCs, like Uber and Lyft to provide patients with free travel to and from medical appointments,[16] and in the future, TNCs could have larger roles in medical travel. One reason taxi/TNC services are attractive is that they do not require a parking space; people can travel to/from the campus site by vehicle without needing to park the vehicle. It is expected that those desiring to travel to the campus site by vehicle in the future are less likely to drive and park, and more likely travel by taxi/TNC due to the door-to-door convenience and removal of looking for and paying for parking in a parking constrained destination. Specifically, the number of people who would otherwise desire to drive alone or carpool to/from campus site – but would not under the CPHP due to the limit on parking supply – was estimated by comparing anticipated parking supply under the CPHP to estimated parking demand based on the continuation of observed historical travel behavior trends. This proportion of people would be reasonably expected to shift their travel behavior and would be more likely to travel by taxi/TNC or drop-off in the future, which reflects a desire to travel by automobile – but one that is not limited by parking availability.

This approach, which contemplates a larger shift to taxi/TNC and drop-off trips, is conservative with respect to estimating the number of vehicle trips associated with the CPHP. Each taxi/TNC or drop-off trip generates two vehicle trips for every person trip: one when the driver arrives to the campus site to pick-up/drop-off a passenger(s) and one when they depart the campus site. The future estimated mode split that reflects this analysis approach is displayed in **Table 4.15-9**. As compared to the existing mode split, the share of faculty/staff driving alone or carpooling to the campus site would decrease, while the share of faculty/staff using taxi/TNC, drop-off, and

15 These estimates include garage and surface lots at the campus site, including the Kezar lot, and exclude parking associated with the Aldea Housing complex.

16 For additional information, see *Uber Health's website* https://www.uberhealth.com/; Recent news coverage of TNC-healthcare partnerships include Sutter Health's partnership with Lyft (https://www.forbes.com/sites/brucejapsen/2020/01/13/lyft-hails-major-hospital-partner-in-sutter-health/) and Medicare Advantage's partnership with Lyft (https://healthpayerintelligence.com/news/lyft-expands-work-with-bcbs-humana-medicare-advantage-plans).

public transit would increase. For patients/visitors, travel by drive alone, carpool, and public transit is expected to decrease, and travel by taxi/TNC and drop-off is expected to increase.

TABLE 4.15-9
CPHP (FUTURE PHASE)[1] MODE SPLIT

Population Group	Drive Alone	Drop-Off	Taxi/ Uber/ Lyft	Car-pool	Van-pool	Public Transit	UCSF Shuttle	Bicycle	Motor-cycle/ Scooter	Walk/ Run	Tele-com-mute	Other
Faculty/ Staff/ Students	13%	5%	8%	2%	1%	33%	12%	6%	1%	16%	2%	0%
Patient/ Visitor	12%	20%	20%	23%	1%	15%	2%	1%	0%	5%	0%	0%
Residents	31%	3%	2%	0%	0%	25%	25%	4%	0%	9%	0%	0%

NOTES:
[1] These mode split estimates reflect full buildout of the CPHP (Future Phase), when the CPHP has been fully implemented.

These estimated future mode splits were used to calculate the daily and peak hour number of vehicle trips, which are presented in **Table 4.15-10**. The daily vehicle trip estimate is an input to the VMT analysis presented below. The PM peak vehicle trip estimate is presented for informational purposes. Compared to existing conditions, the daily and PM peak hour vehicle trips are expected to increase by approximately 95 percent and 75 percent, respectively.

TABLE 4.15-10
CPHP (FUTURE PHASE)[1] DAILY AND PEAK HOUR VEHICLE TRIPS (COMPARED TO EXISTING CONDITIONS[2])

Population Group	Daily	PM Peak
Faculty/Staff/Students	10,600	1,900
Patient/Visitor	16,500	1,200
Residents	1,700	300
Total	**28,800 (+95%)**	**3,400 (+75%)**

NOTES:
[1] The vehicle trip estimates reflect full buildout of the CPHP (Future Phase), when the CPHP has been fully implemented.
[2] Percentages represent the percent change from the existing condition to full buildout of the CPHP.

In recent months, travel behavior has changed at a global level as a result of the COVID-19 pandemic. In San Francisco travel patterns (both amount and mode of trips) have changed significantly since a "shelter-in-place" order was issued on March 17, 2020. For example, telework and telemedicine services have increased, and transit use has decreased.

As discussed in the *Environmental Setting*, Muni has been operating reduced transit service in San Francisco under a COVID-19 Core Service Plan since April 8, 2020. The timing and degree to which transit service is reinstated in San Francisco is uncertain at present. The SFMTA has developed a Transportation Recovery Plan, which represents a guiding framework for expanding transportation services and operations as the "shelter-in-place" orders are modified and demand for travel increases. Financial constraints will also likely impact Muni's ability to restore transit service.

At the time of publication of the Draft EIR, the medium- or long-term effects of the COVID-19 pandemic on travel behavior are uncertain and it would be speculative to estimate any of these possible changes, which may include various effects such as increased telework and telemedicine services or less transit ridership. To the degree that telework/telemedicine increases over the long-term, as compared to a 2019 baseline, this could result in less VMT than projected as part of this study. Should transit ridership decrease over the long-term, as compared to a 2019 baseline, with more people choosing to drive or be driven, this could result in additional VMT than projected as part of this study.

Trip Distribution

For each population group, project-generated vehicle trip origins and destinations were analyzed as coming to or from the four superdistricts in San Francisco, (i.e., northeast, northwest, southeast, and southwest quadrants of the City), different regions in the Bay Area (East Bay, North Bay, Peninsula, South Bay), or outside the Bay Area. Trip distributions were based on information collected by UCSF in the 2018 Employee Commute Survey, 2017-18 Patient/Visitor Survey, and a 2013 survey of Aldea and Avenue Housing as presented in the 2014 LRDP. As previously noted in Table 4.15-10, the campus site would generate 28,800 daily vehicle trips across all population groups. These trips were then distributed regionally, with the resulting trip distribution percentages shown in **Table 4.15-11**. The results of the vehicle trip distribution analysis were used in to determine average VMT by population.

TABLE 4.15-11
PROJECT TRIP DISTRIBUTION BY POPULATION GROUP

	SD 1	SD 2	SD 3	SD 4	East Bay	North Bay	Peninsula	South Bay	Outside Bay Area
Faculty/Staff/Students	3%	12%	15%	17%	15%	10%	24%	3%	1%
Patient/Visitor	4%	5%	11%	7%	18%	11%	11%	6%	27%
Residents	24%	10%	46%	11%	3%	2%	0%	3%	1%

Parking and Loading Estimates

Although parking and loading demand are not CEQA significance topics, parking and loading demand estimates are presented, as they relate to the overall travel demand analysis. Parking demand was an important consideration in the travel demand process, as described above. Passenger loading demand is an output of the travel demand process and is related to parking demand. Parking demand reflects the space needed on campus to accommodate people who travel to/from the campus site by drive alone or carpool, whereas passenger loading demand reflects the space needed for those who travel by taxi/TNC or drop-off.

Parking Demand

Parking demand estimates were calculated based on population type, expected mode of travel to and from the campus site, and average vehicle occupancy. The number of daily parked vehicles reflects vehicle trips associated with drive alone and carpool trips, and excludes vanpool vehicle

trips, which are parked in a separate, dedicated parking lot. The expected daily parking demand and peak hour parking demand for a typical weekday are summarized in **Table 4.15-12** by population group. Peak parking hour is distinct from the PM peak hour and reflects the time of day with the greatest parking demand. For the off-street parking garages, the peak parking hour occurs at approximately 11:00 AM, as presented in Table 4.15-6. Compared to existing conditions, the daily and peak parking hour parking demand are expected to decrease by approximately three percent and eight percent, respectively. This decrease reflects the expected decrease in off-street parking supply (by approximately 400 parking stalls) associated with the CPHP, which would essentially "cap" the number of drive alone and carpool trips to/from campus that require a parking stall across both the faculty/staff and patient/visitor populations.

TABLE 4.15-12
CPHP (FUTURE PHASE)[1] DAILY AND PEAK PARKING DEMAND (COMPARED TO EXISTING CONDITIONS)

Population Group	Daily Parking	Peak Parking Hour
Faculty/Staff/Students	2,500	1,900
Patient/Visitor	2,600	900
Residents	700	100
Total[2]	**5,800 (-3%)**	**2,900 (-8%)**

NOTES:
1 The parking demand estimates reflect full buildout of the CPHP (Future Phase), when the CPHP has been fully implemented.
2 Percentages presented in parentheses represent the percent change from the existing condition to full buildout of the CPHP.

The on-street parking supply within the vicinity of the campus site is expected to remain constant between existing conditions and implementation of the CPHP at approximately 1,000 parking spaces. Since existing on-street parking occupancies are about 90 percent on average over the course of the day (as shown in Table 4.15-5), it is not expected that there would be additional on-street parking supply to meet additional parking demand related to UCSF populations. Therefore, the total parking demand is expected to be approximately equal to the total parking supply of 2,900 spaces, which includes both off-street and on-street parking facilities.

Loading Demand

Passenger loading demand was calculated based on the expected number of people traveling to the campus site by taxi/TNC or drop-off during the PM peak hour. As described above, more people are expected to travel to/from the campus site by taxi/TNC or drop-off as a result of the limited campus parking supply. Considering the PM peak hour passenger loading demand, it is expected that up to approximately 45 passenger loading instances would occur simultaneously during the peak minute of the peak hour. The expected PM peak hour passenger loading demand and peak minute passenger loading demand range is summarized in **Table 4.15-13** by population group. Compared to existing conditions, the PM peak hour and peak minute loading demand are expected to increase by approximately 240 percent.

TABLE 4.15-13
CPHP (FUTURE PHASE)[1] PM PEAK HOUR AND PEAK MINUTE LOADING DEMAND
(COMPARED TO EXISTING CONDITIONS)

Population Group	PM Peak Hour	Peak Minute
Faculty/Staff/Students	650	20-25
Patient/Visitor	500	15-20
Residents	40	1-2
Total[2]	**1,210 (+240%)**	**35-45 (+240%)**

NOTES:
1 The loading demand estimates reflect full buildout of the CPHP (Future Phase), when the CPHP has been fully implemented.
2 Percentages presented in parentheses represent the percent change from the existing conditions to full buildout of the CPHP.

Compared to the anticipated passenger loading supply with full implementation of the CPHP, presented in **Table 4.15-14**, once the CPHP is fully implemented, passenger loading demand during the PM peak hour may exceed supply during the peak minute.

TABLE 4.15-14
CPHP (FUTURE PHASE)[1] ANTICIPATED PASSENGER LOADING SUPPLY

Passenger Loading Location	Proposed Loading Spaces
Parnassus Avenue (On-Street)	13
Proposed Millberry Union Garage Passenger Loading Location	5-6
Proposed New Hospital Passenger Loading Loop	8-10
Proposed Fourth Avenue Extension (On-Street)	4-6
Total	**30-35**

NOTES:
1 The loading supply estimates reflect full buildout of the CPHP (Future Phase), when the CPHP has been fully implemented.

VMT Estimates

The VMT analysis presented below reflects two different methodologies: one based on the *SF Guidelines* methodology for estimating VMT for San Francisco projects, and the other based on a project-specific methodology. The estimates based on *SF Guidelines* are presented for comparison purposes. The project-specific methodology used for the impact assessment calculates average daily VMT for specific CPHP populations using the results of the travel demand analysis. Thus, the project-specific method incorporates UCSF-specific data on the travel patterns associated with the existing population and urban context of the campus site. The transportation assessment focuses on VMT per capita estimates for residential and office uses; total VMT, which includes all VMT generated by the project was also calculated and used as an input for the air quality analysis presented in *Section 4.2, Air Quality*.

VMT Estimates based on SF Guidelines

Under the *SF Guidelines*, the Transportation Authority's SF-CHAMP travel demand forecasting model is used to estimate the daily VMT for residential, office and retail land use types for existing and future (2040) cumulative conditions for the TAZ in which the proposed project is located (this approach is considered to be "map-based screening" for VMT impacts). Separate calculations of VMT are performed for residential, office, and retail uses, each one of which is then divided by the applicable geographic household population, office jobs, or retail employment to calculate the VMT per capita.

The *SF Guidelines* also indicate how to apply the map-based screening criteria to the other land use types which are not residential, office, or retail uses; for example:

- Student housing should be treated as residential for screening and analysis.
- Medical and childcare land uses, and tourist hotel workers should be treated as office for screening and analysis.

Because the Parnassus Heights campus site encompasses multiple TAZs, the per capita values presented in the *SF Guidelines* could not be used directly. Instead, the existing and future total daily VMT for the residential and office uses of each TAZ were obtained from the SF-CHAMP model, aggregated for the five TAZs, and then divided by the applicable geographic household population or office jobs to calculate the average daily VMT per capita for residential and office populations. The retail VMT was not analyzed, given the relatively small size and ancillary nature of the retail uses on the campus site.

VMT Estimates based on Project-specific Data

Given that the five TAZs encompass parts of the adjacent neighborhoods (mostly residential, but also retail, medical and other office uses unrelated to UCSF), a project-specific methodology was used to calculate the average daily VMT using travel information from the CPHP. The calculations take into account the various types and travel characteristics of the existing and future UCSF employees, residents, and visitors to estimate the average daily VMT specific to the campus site.

The average daily VMT was calculated by multiplying the number of existing and future site-generated vehicle trips originating from or destined for the four San Francisco superdistricts, the East Bay, North Bay, South Bay, and out of the bay area region by an average distance between the campus site and the estimated center of gravity for each of the eight zones. These daily VMT estimates were then divided by the appropriate household population or jobs to calculate the average daily VMT per capita. This method is considered a spreadsheet model based on project-specific data and local data on trip modes and lengths, which is consistent with the spreadsheet-based methods the Governor's Office of Planning and Research (OPR) indicates may be used to estimate VMT in its *Technical Advisory on Evaluating Transportation Impacts in CEQA* (*"Technical Advisory"*).[17]

[17] This document is accessible at http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf

Table 4.15-15 shows the existing and future average daily VMT per capita for the campus site, using both the *SF Guidelines* methodology and the project-specific methodology described above.

TABLE 4.15-15
EXISTING AND FUTURE DAILY VMT PER CAPITA

	Residential: Average VMT per resident[1]		Office: Average VMT per employee[2]	
	Existing	2040	Existing	2040
Parnassus Heights Area (SF Guidelines)[3]	9.8	9.5	8.9	8.7
Parnassus Heights Campus Site (CPHP Estimate)[4]	6.9	8.5	9.4	10.9

NOTES:
1 Represents student housing residents and hotel guests
2 Represents UCSF faculty, physicians, nurses, students, trainees and other UCSF staff, as well as childcare and hotel workers.
3 TAZs 226, 227, 545, 546, and 547; includes adjacent residential, retail, medical and other office uses unrelated to UCSF.
4 Represents UCSF campus site exclusively; 2040 conditions represent the estimated future mode split of the CPHP project.

SOURCE: Adavant Consulting, 2020.

As presented in Table 4.15-15, the average daily VMT results for the Parnassus Heights area (five TAZs in the SF-CHAMP model) and the Parnassus Heights campus site (Parnassus Heights campus site boundaries) are similar under all conditions. Some variation is expected, since the differences between the two analysis areas reflect different study areas and associated land use mixes in their VMT calculations. For example, the existing and future residential VMT estimates for the Parnassus Heights campus site are less than that of the five TAZs in the Parnassus Heights Area, while the opposite trend can be observed for the office VMT estimates.

Impact Analysis

Impact TRANS-1: Implementation of the CPHP would not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities. (Less than Significant)

Consistency with UC Plans and Policies

CPHP

Consistency with The University of California Sustainable Practices Policy. The proposed CPHP is consistent with the transportation-related goals and policies set forth in the *UC Sustainable Practice Policy* as it continues to encourage a shift away from drive-alone commute trips, which are a primary contributor to commute GHG emissions and localized transportation impacts. Already, approximately 23 percent of UCSF employees currently drive alone to the campus site, which is below the *UC Sustainable Practices Policy* target of having no more 40 percent of employees commuting by this mode of travel by 2050. In the future, under implementation of the proposed CPHP, it is anticipated that a lower percentage of employees would drive-alone to the campus site partially as result of the limited parking supply on campus (described above in more detail in the "Travel Demand Estimates" section).

Under the proposed CPHP, UCSF would continue its existing TDM program described in the "Local Setting" section, such as priced permit parking, carpool/vanpool, and telecommuting programs, which have historically been effective TDM strategies to reduce the number of drive-alone trips to/from the campus site.

The proposed CPHP includes a net decrease in parking spaces on campus (as described in the "Travel Demand Estimates" section), and therefore does not include a business-case analysis for new proposed parking structures, consistent with the *UC Sustainable Practices Policy.* The proposed CPHP proposes one new parking structure on the West End of the campus site, which would replace existing parking spaces that are planned to be removed under the CPHP.

Consistency with the 2014 LRDP. The proposed CPHP is also consistent with the 2014 LRDP transportation-related goals and policies. The proposed CPHP includes elements to facilitate intuitive wayfinding and easy navigation between buildings consistent with 2014 LRDP goal to "incorporate pedestrian-friendly urban design principles" in and around the campus site. In addition, the proposed CPHP included the development of a bridge across, and/or tunnel beneath, Parnassus Avenue, which would improve pedestrian connections between the north side and south side of the street.

Also, as described in the "Local Setting" section, under the proposed CPHP, UCSF would continue its existing TDM program, which have historically been effective TDM strategies to reduce the number of drive-alone trips to/from the campus site. UCSF continues to prioritize parking for use by patients and essential healthcare providers in their Millberry Union garage (public parking for patients) and Medical Building 1 garage (permit parking for faculty, staff with patient care responsibilities, and senior management). By proposing additional housing at the Aldea Housing complex site and new housing within the West Side district for students, trainees, and faculty, the proposed CPHP is also consistent with the 2014 LRDP goal of reducing commute travel by providing additional campus housing.

The proposed CPHP is also consistent with the 2014 LRDP *Community Planning Principles* as UCSF will continue implementing its comprehensive TDM program, as well as coordinating with relevant local and regional agencies to advance San Francisco's Transit First policy, minimize congestion and provide viable transportation alternatives to single-occupancy vehicles. Finally, by reducing net parking supply on the campus site, the proposed CPHP would not build parking in excess of anticipated need.

Based on the above, the proposed CPHP would be consistent with the transportation-related goals and policies set forth in the *UC Sustainable Practices Policy* and the 2014 LRDP*,* and the impact would be less than significant.

Mitigation: None required.

Irving Street Arrival

The Irving Street Arrival project would mainly involve modifications to the existing Medical Building 1 in order to develop a new and/or reconfigured multistory vertical circulation space

between Medical Building 1 and Millberry Union. In doing so, the project would help improve wayfinding and navigation between Irving Street and Parnassus Avenue. The Irving Street Arrival project would not involve any modifications to city streets. The project would therefore be consistent with the transportation-related goals and policies set forth in the *UC Sustainable Practices Policy* and the 2014 LRDP*,* and the impact would be less than significant.

Mitigation: None required.

Research and Academic Building

The proposed Research and Academic building (RAB) would occupy the site currently occupied by UC Hall. The impact related to conflict with a program, plan, ordinance or policy addressing the circulation system for the CPHP as a whole, including the RAB, is set forth above and would be less than significant.

Mitigation: None required.

Initial Aldea Housing Densification

During the initial phase of housing densification on the Aldea Housing complex, three existing 3-story housing structures would be replaced with three 8-story housing structures and one 5-story building. By adding additional housing, this project helps achieve the 2014 LRDP goal to "reduce commute travel by providing additional campus housing." Therefore, the initial Aldea Housing Densification project would have a less-than-significant impact related to conflict with a program, plan, ordinance or policy addressing the circulation system.

Mitigation: None required.

Initial Phase Improvements

The Initial Phase improvements that relate to the transportation include the proposed Service Corridor (as part of larger Utility Improvements), any changes to the Parnassus Avenue Streetscape Plan, and Neighborhood Investments. The Service Corridor would facilitate the transport of goods and back-of-house commercial loading activities. The Parnassus Avenue Streetscape Plan aims to create a sense of place on the street while balancing competing needs of different street users by reallocating curbside uses and installing pedestrian safety improvements such as widened crosswalks and bulbouts.[18] Neighborhood Investments refer to voluntary improvements to public streets or other public realm areas, which - while not considered mitigation measures under CEQA - may nonetheless improve operations or otherwise enhance conditions at those locations. In these ways, these projects would generally have a positive effect on transportation in the vicinity of the campus site. Therefore, these CPHP Initial Phase improvements would have a less-than-significant impact related to conflict with a program, plan, ordinance or policy addressing the circulation system.

Mitigation: None required.

[18] Note: the Parnassus Avenue Streetscape Plan was analyzed as part of the 2014 LRDP FEIR and no specific changes have been identified as part of the CPHP at this point in time.

Consistency with Local Plans and Policies

Consistency with San Francisco's Transit First Policy. The proposed CPHP would be implemented in a way that would continue to give people walking, biking, and using public transit priority in the public rights-of-way. The design of the proposed CPHP would maintain existing Muni bus stops on Parnassus Avenue and light rail stops on Irving Street. The proposed CPHP would maintain the existing sidewalks, crosswalks, and bicycle facilities within the campus site. In addition, the proposed CPHP included the development of a bridge across, and/or tunnel beneath, Parnassus Avenue, which would improve pedestrian connections between the north side and south side of the street. Therefore, the proposed CPHP would not conflict with San Francisco's Transit First Policy.

Consistency with San Francisco's Better Streets Plan. The proposed CPHP would be implemented in a way that would continue to create a positive pedestrian environment in and around the campus site, consistent with San Francisco's Better Streets Plan. The proposed CPHP would maintain the existing sidewalks and crosswalks in the campus site. New roadways such as the proposed extension of Fourth Avenue would be designed consistent with the recommendations and design guidelines presented in the Better Streets Plan, including sidewalk width. Therefore, the proposed CPHP would not conflict with the Better Streets Plan.

Consistency with the San Francisco Bicycle Strategy. The proposed CPHP would be implemented in a way that would continue to create a safe and attractive environment for bicycling, consistent with the San Francisco Bicycle Strategy. The proposed CPHP would maintain the existing bicycle facilities within the campus site. The proposed CPHP would maintain existing short-term and long-term bicycle parking facilities as well as provide additional short-term and long-term bicycling parking facilities in convenient locations, as needed to maintain adequate bicycling parking facilities on campus. Therefore, the proposed CPHP would not conflict with the San Francisco Bicycle Strategy.

Since the CPHP would not conflict with San Francisco's Transit First Policy, Better Streets Plan, or the San Francisco Bicycle Strategy, the impact would be less than significant.

Mitigation: None required.

Irving Street Arrival

The Irving Street Arrival project would not involve any modifications to city streets. There would be no conflicts with a program, plan, ordinance or policy addressing the circulation system, and the impact would be less than significant.

Mitigation: None required.

Research and Academic Building

The proposed RAB would involve modifications to Parnassus Avenue sidewalk and streetscape adjacent to the project site. These improvements would be designed to conform to San Francisco's Better Streets Plan discussed above. There would be no conflicts with a program,

plan, ordinance or policy addressing the circulation system, and the impact would be less than significant.

Mitigation: None required.

Initial Aldea Housing Densification

The proposed initial Aldea Housing Densification project would not require any modifications to city streets. There would be no conflicts with a program, plan, ordinance or policy addressing the circulation system, and the impact would be less than significant.

Mitigation: None required.

Initial Phase Improvements

To the degree to which the Initial Phase improvements - such as the proposed Service Corridor, any changes to the Parnassus Avenue Streetscape Plan, and Neighborhood Investments - would involve modifications to city streets, these improvements would be designed to conform to San Francisco's Better Streets Plan discussed above. By relocating curbside uses and implementing pedestrian safety treatments, the Parnassus Avenue Streetscape Plan would improve mobility for people walking, biking and taking transit. There would be no conflicts with a program, plan, ordinance or policy addressing the circulation system, and the impact would be less than significant.

Mitigation: None required.

Impact TRANS-2: Implementation of the CPHP would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b). (Less than Significant)

CEQA Guidelines Section 15064.3, subdivisions (a) and (b) refer to the discontinuation of vehicle level of service (LOS) as an impact metric for transportation analysis and instead states that VMT is the most appropriate measure of transportation impacts. A project would have a significant impact related to VMT if it would cause substantial additional VMT or substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow travel lanes) or by adding new roadways to the network. A project would generate substantial additional VMT if it would exceed regional household VMT per capita minus 15 percent.[19] Regional household VMT per capita includes both residential and office VMT. As documented in OPR's *Technical Advisory*, "achieving 15 percent lower per capita… VMT than existing development is both generally achievable and is supported by evidence that connects this level of reduction to the state's emissions goals,"[20] and therefore represents a reasonable threshold for determining VMT impacts.

[19] OPR's transportation impact guidelines state that a project would cause substantial additional VMT if it were to exceed both existing city household VMT per capita minus 15 percent and existing regional household VMT per capita minus 15 percent. In San Francisco, the city's average VMT per capita is lower (8.4) than the regional average (17.2). Therefore, city average VMT is irrelevant for the purposes of the analysis.

[20] OPR, *Technical Advisory on Evaluating Transportation Impacts in CEQA*, December 2018, page 12.

CPHP

Table 4.15-16 presents the VMT per capita estimates for Parnassus Heights campus site residents and employees under the CPHP and compares them to the project significance threshold of 15 percent below the regional average VMT per capita.

TABLE 4.15-16
EXISTING AND FUTURE DAILY VMT PER CAPITA – CPHP (FULL BUILDOUT)

	Residential: Average VMT per resident[1]		Office: Average VMT per employee[2]	
	Existing	**2040**	**Existing**	**2040**
San Francisco Bay Area Regional Average	17.2	16.1	19.1	17.0
Project Threshold (Regional minus 15%)	**14.6**	**13.7**	**16.2**	**14.5**
UCSF Parnassus Heights Campus Site (CPHP Estimate)[3]	6.9	8.5	9.4	10.9

NOTES:
1 Represents residents and hotel guests
2 Represents UCSF faculty, physicians, nurses, students, trainees and other UCSF staff, as well as childcare and hotel workers.
3 Represents UCSF campus site exclusively; 2040 conditions represent the estimated future mode split of the CPHP project.

SOURCE: Adavant Consulting, 2020.

Both the existing and future average daily VMT per capita for residential and office uses under the CPHP are substantially less than the respective thresholds of significance. Therefore, the impact related to the change in VMT per capita rates from the implementation of the CPHP would be less than significant. As the impact would be less than significant, no mitigation is required. However, the analysis of air quality impacts in Section 4.2 (Impact AIR-2), which is based on total VMT associated with the CPHP, shows that increased vehicle travel to and from the campus would result in increased emissions of PM10 that would exceed the BAAQMD thresholds. As mitigation for the significant impact on air quality, UCSF will monitor changes in its VMT per capita rates on an annual basis, and will implement enhancements to the UCSF TDM program to include strategies that reduce drive-alone, taxi/TNC, and drop-off trips which contribute most to total and VMT per capita.

Induced Automobile Travel Assessment

In addition to the proposed land use changes included in the CPHP, the CPHP includes several changes to local transportation infrastructure.

Transportation projects have the potential to induce additional automobile travel. However, OPR's recommended transportation impact guidelines include a list of transportation project types that would not be likely to lead to a substantial or measurable increase in VMT. If a project fits within the general types of projects (including combinations of types) described below, then it is presumed that VMT impacts would be less than significant, and a detailed VMT analysis is not required:

- Active Transportation, Rightsizing (aka Road Diet), and Transit Projects:
  - Infrastructure projects, including safety and accessibility improvements, for pedestrians and bicyclists.
  - Installation or reconfiguration of traffic-calming devices.
  - Creation of new or addition to roadway capacity on local or collector streets, provided the project also substantially improves conditions for people walking, bicycling, and, if applicable, riding transit (e.g., by improving neighborhood connectivity or improving safety).
- Other Minor Transportation Projects:
  - Rehabilitation, maintenance, replacement, and repair projects designed to improve the condition of existing transportation assets (e.g., highways, roadways, bridges, culverts, tunnels, transit systems, and bicycle and pedestrian facilities) that do not add additional motor vehicle capacity.
  - Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left-turn lanes, right-turn lanes, U-turn pockets, or emergency breakdown lanes that are not used as through lanes.
  - Installation, removal, or reconfiguration of traffic control devices, including transit signal priority features.
  - Timing of signals to optimize vehicle, bicycle, or pedestrian flow on local or collector streets.
  - Addition of transportation wayfinding signage.
  - Removal of off- or on-street parking spaces.
  - Adoption, removal, or modification of on-street parking or loading restrictions (including meters, time limits, accessible spaces, and preferential/reserved parking permit programs).

Accordingly, the proposed transportation network changes within the study area evaluated for potential VMT impacts are listed below, along with discussion regarding why each change does not require a detailed VMT assessment.

Extension of Fourth Avenue: The CPHP would add a new section of roadway between Parnassus Avenue and Kirkham Street and provide access to the future planned uses in the West End. This roadway would be a local street, primarily designed to provide access to the Parnassus Heights campus site and would include traffic-calming design elements such as narrow lanes, pedestrian crosswalks, full sidewalks, and bicycle infrastructure. In addition, the primary purpose of this roadway would be to provide access to the site, and not to provide a pathway for through traffic. The extension of Fourth Avenue would also provide access for service vehicles to/from the proposed multi-level service corridor between Medical Center Way and the Fourth Avenue extension. As such, this transportation improvement would not be expected to result in a significant impact on VMT.

Installation of new off-street roadway loop for short-term parking and passenger loading adjacent to the New Hospital: The CPHP includes an off-street roadway loop for short-term parking and passenger loading adjacent to the New Hospital. It would not be

designed for through traffic and would not add additional vehicle capacity; therefore, this transportation improvement would not be expected to result in a significant impact on VMT.

The potential removal of the existing off-street roadway loop for short-term parking and passenger loading adjacent to Moffitt Hospital: In conjunction with the planning and design of a new short-term parking and passenger loading loop adjacent to the New Hospital, the New Hospital project may require removing the existing off-street roadway loop adjacent to the existing Moffitt Hospital. As the existing loop is not designed for through traffic, its removal would not result in a significant impact on VMT.

The widening and potential regrading of portions of Medical Center Way south of Parnassus Avenue adjacent to the New Hospital: The CPHP would widen Medical Center Way to meet the fire safety requirements for roadways of this type, and would not add additional vehicle capacity. Therefore, this transportation improvement would not be expected to result in a significant impact on VMT.

In addition to the changes to the roadway network described above, the CPHP contemplates installing an off-street passenger loading facility within the Millberry Union garage. Access to this facility would rely on the existing Millberry Union garage access ramps and would not require building additional access facilities. Therefore, it would not alter the local roadway network and would not be expected to result in a significant impact on VMT.

Based on the discussion provided above, the proposed changes to transportation facilities included in the CPHP would result in a less than significant impact on VMT.

Mitigation: None required.

Irving Street Arrival, RAB, Initial Aldea Housing Densification Projects, and Initial Phase Improvements

Of these Initial Phase projects, only the RAB and the initial Aldea Housing Densification projects would add additional population to the campus site. These two projects were assessed to estimate average daily VMT per capita for residential and office uses. The Irving Street Arrival project would not increase the population on the campus site or influence overall travel demand and behavior, and consequently, would have no impact on VMT.

The proposed RAB would occupy the campus site currently occupied by UC Hall, and would increase the daily population on campus by approximately 2,000 faculty, staff, and/or visitors. The initial Aldea Housing Densification project would increase the daily population on campus by approximately 300 residents and residential visitors. These projects would therefore result in more person trips to/from campus, including additional vehicle trips. However, these projects would not influence how people travel to/from the campus; they would travel similar to existing populations.

Table 4.15-17 presents the existing and future VMT per capita estimates for residents and employees related to the Initial Phase projects and compares them to the project significance threshold of 15 percent below the regional average.

TABLE 4.15-17
EXISTING AND FUTURE DAILY VMT PER CAPITA – RAB AND INITIAL ALDEA HOUSING DENSIFICATION PROJECTS

	Residential: Average VMT per resident[1]		Office: Average VMT per employee[2]	
	Existing	**2040**	**Existing**	**2040**
San Francisco Bay Area	17.2	16.1	19.1	17.0
Project Threshold (Regional minus 15%)	**14.6**	**13.7**	**16.2**	**14.5**
UCSF Parnassus Heights Campus Site (CPHP Initial Projects Estimate)	5.4		10.0	

NOTES:
[1] Represents campus housing residents.
[2] Represents UCSF faculty, physicians, nurses, students, trainees and other UCSF staff, as well as childcare and hotel workers.
[3] CPHP Initial Projects are anticipated to be complete by 2030 and are compared to both existing and 2040 regional averages for average VMT per resident and per employee.

SOURCE: Adavant Consulting, 2020.

The average daily VMT per capita for residential and office uses with implementation of the RAB and the initial Aldea Housing Densification projects are substantially less than both the existing and future thresholds of significance. Therefore, the impact related to VMT per capita of the Initial Projects would be less than significant.

Mitigation: None required.

The Initial Phase improvements propose one planned transportation network change within the study area:

Installation of a multi-level service corridor: The Initial Phase improvements include the construction of a multi-level service corridor that would extend from roughly Medical Center Way to Koret Way (and the new extension of Fourth Avenue in the future), and would provide access for freight and utility vehicles to transport goods and materials for back-of-house purposes. The service corridor would be designed as a local roadway and would facilitate travel by freight vehicles via Medical Center Way and/or the proposed extension of Fourth Avenue. Freight vehicles would otherwise take a longer route; therefore, this transportation element would not be expected to result in a significant impact on VMT.

Therefore, these Initial Phase projects and improvements would not result in any changes to the transportation network and do not include any transportation projects that would substantially induce additional automobile travel. Therefore, VMT impacts related to inducing additional automobile travel associated with these Initial Phase projects would be less than significant.

Mitigation: None required.

Impact TRANS-3: Implementation of the CPHP would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). (Less than Significant)

CPHP

As described in Impact TRANS-2, above, the CPHP proposes the following changes to the roadway network within the study area:

- Extension of Fourth Avenue between Parnassus Avenue and Kirkham Street
- A new off-street roadway loop for short-term parking and passenger loading adjacent to the New Hospital
- The potential removal of the existing off-street roadway loop for short-term parking and passenger loading adjacent to Moffitt Hospital
- The widening and potential regrading of portions of Medical Center Way south of Parnassus Avenue adjacent to the New Hospital

The proposed extension of Fourth Avenue would serve as the main access point for future new buildings to the west of the proposed RAB, including the new housing structures on the West Side. As a campus street open to all vehicles, the Fourth Avenue extension would include on-street parking, sidewalks, and loading areas. The proposed Fourth Avenue extension would be designed based on applicable design standards for all roadways in the City and County of San Francisco, including the *San Francisco Public Works Standard Specification and Standard Plans*, as well as the *Project Manual* and reference documents.[21] Future streetscape design for public roadways should also apply best practices in traffic calming and pedestrian facilities to minimize conflicts and to moderate vehicle speeds, consistent with San Francisco's Better Streets Plan and the *California Manual on Uniform Traffic Control Devices*. The new roadway would also be subject to review, and approval by the relevant City departments, including SFPW, SFMTA, and San Francisco Public Utilities Commission (SFPUC).

The New Hospital would design and install a new off-street roadway loop to serve short-term parking and passenger pick-up and drop-off activities to largely serve hospital patients and visitors. A new hospital loading loop would add two new curb cuts across the sidewalk on the south side of Parnassus Avenue to accommodate vehicles entering and exiting the loading loop. The details of the proposed roadway loop are subject to further analysis and review as part of a future environmental review process specific to the New Hospital project. The new hospital loading loop would be sized to accommodate anticipated passenger loading demand. Its design will be coordinated with the Irving Street Arrival project and implementation of the Parnassus Avenue Streetscape Plan in order to also accommodate the planned widening of the pedestrian crossing located between Medical Building 1 and Millberry Union. The project would use the

[21] Additional details can be found on the City's website at https://www.sfpublicworks.org/services/standards-specifications-and-plans.

appropriate design standards for any new transportation facilities, such as those described above, and would therefore not substantially increase hazards.

In conjunction with the planning and design of a new short-term parking and passenger loading loop adjacent to the New Hospital, the New Hospital project may require removing the existing off-street roadway loop adjacent to the existing Moffitt Hospital. By removing the existing Moffitt Loop, implementation of a new hospital loading loop would maintain the same number of curb cuts (location where a vehicle is able to cross a sidewalk) on Parnassus Avenue; the two curb cuts for entry/exit of Moffitt Loop would be replaced by two curb cuts for entry/exit of the new loading loop.

The New Hospital project includes widening and potentially regrading portions of Medical Center Way south of Parnassus Avenue and adjacent to the New Hospital. The roadway would be widened to meet the fire safety requirements for roadways of this type. Widening of Medical Center Way may result in encroachment on the Reserve; as indicated in Chapter 3, *Project Description*, UCSF would replace any Reserve acreage lost resulting from new development under the CPHP by creating new Reserve acreage elsewhere within the campus site. The roadway improvements will be designed based on applicable design standards described above, and would be subject to review, and approval by the relevant City departments, including SFPW, SFMTA, and SFPUC.

In addition to the changes to the roadway network described above, the CPHP contemplates installing an off-street passenger loading facility within the Millberry Union garage. Access to this facility would rely on the existing Millberry Union garage access ramps and would not require building additional access facilities. Therefore, it would not alter the local roadway network. This facility would also be designed consistent with the design guidelines referenced above.

By following the design guidelines referenced above, the CPHP would not substantially increase hazards, including hazards to pedestrian safety, due to a geometric design feature. In addition, the CPHP does not propose any incompatible uses. Therefore, the impact would be less than significant.

Mitigation: None required.

Irving Street Arrival, RAB, Initial Aldea Housing Densification Projects, and Initial Phase Improvements

These Initial Phase projects and improvements propose one transportation network change within the study area. The proposed multi-level service corridor would facilitate transport of goods and materials for back-of-house functions and provide easy access to major utility lines serving the campus site. The service corridor is envisioned to be located above ground on its east end. Given the existing topography, several options are being considered for its routing on the western end.

Similar to the proposed Fourth Avenue extension, the proposed service corridor would be designed based on applicable design standards for all roadways in the City and County of

San Francisco, including the *San Francisco Public Works Standard Specification and Standard Plans*, as well as the *Project Manual* and reference documents.[22] This new roadway would also be subject to review, and approval by the relevant City departments, including SFPW, SFMTA, and San Francisco Public Utilities Commission (SFPUC).

The Irving Street Arrival, RAB, and initial Aldea Housing Densification projects do not propose any additional new roadways or incompatible uses. Therefore, these Initial Phase projects would not substantially increase hazards due to a geometric design feature or incompatible uses, and therefore, the impact would be less than significant.

Mitigation: None required.

Impact TRANS-4: Implementation of the CPHP would not result in inadequate emergency access. (Less than Significant)

CPHP

Potential impacts on emergency access were assessed qualitatively. Specifically, the analysis assessed whether the proposed street network changes associated with the proposed CPHP would impair, hinder, or preclude adequate emergency vehicle access.

Under existing conditions, emergency vehicles travel on major local roadways including Parnassus Avenue/Judah Avenue, Stanyan Street, Lincoln Way, and Seventh Avenue, when heading to and from an emergency and/or emergency facility. In the future, emergency vehicles would use these same streets to reach the campus site from the nearest fire department stations, police department stations, or other hospitals. On all streets surrounding the campus site, non-emergency vehicles would continue to yield the right-of-way, per the California Vehicle Code.

Stanyan Street (north of Frederick Street) and Lincoln Way are multi-lane arterial roadways that allow emergency vehicles to travel at higher speeds and permit other traffic to maneuver out of the path of the emergency vehicle. Although Parnassus Avenue/Judah Avenue and Seventh Avenue have one travel lane in each direction, they are each approximately 32 feet wide and have a two-way left-turn lane in the center. Although typical vehicle travel lanes in San Francisco are between 10 and 12 feet wide, a typical passenger vehicle is between 6 and 7 feet wide. The combination of the lane widths and center turn lanes would therefore allow non-emergency vehicles enough space to yield to emergency vehicles headed to the campus site.

The proposed CPHP would not make any changes to city streets adjacent to the campus site or include elements that would conflict with adopted codes regarding street widths and turning movements. Furthermore, the proposed CPHP would not include any design features that would hinder or preclude emergency vehicle access. UCPD would also continue to maintain a substation

[22] Additional details can be found on the City's website at https://www.sfpublicworks.org/services/standards-specifications-and-plans.

on the campus site under the CPHP. Therefore, implementation of the CPHP would not result in inadequate emergency access; the impact would be less than significant.

Mitigation: None required.

Irving Street Arrival, RAB, Initial Aldea Housing Densification Projects, and Initial Phase Improvements

With implementation of the Initial Phase projects such as the Irving Street Arrival, RAB, and initial Aldea Housing Densification projects and the Initial Phase improvements, emergency vehicle access to the campus site would be similar to existing conditions. Therefore, similar to the discussion presented for the CPHP as a whole, the Initial Phase projects and improvements would not result in inadequate emergency access; the impact would be less than significant, and no mitigation measures are necessary.

Mitigation: None required.

Impact TRANS-5: Construction activities under the CPHP could temporarily impact travel conditions along sidewalks and roadways serving the campus site. (Potentially Significant; Less than Significant with Mitigation)

The discussion of construction impacts is based on currently available information from UCSF, as summarized in Chapter 3, *Project Description*; local and state regulations regarding use of the public right-of-way; and experience with typical construction practices by UCSF in San Francisco. As discussed in Chapter 3, implementation of the CPHP would be spread over the next thirty years and would preserve UCSF's operations at the Parnassus Heights campus site during the construction period. Construction would begin in mid-2021, with Initial Phase projects anticipated to be completed by 2030, and Future Phase projects implemented over the remainder of the CPHP and completed by horizon year 2050.

CPHP

Construction activities at the campus site under the proposed CPHP would result in truck trips associated with the delivery of construction materials and the off haul of demolition debris, excavated soil and construction wastes and vehicle trips to and from the site by construction workers. These trips would have the potential to cause temporary disruptions to nearby streets, transit services, and pedestrian and bicycle facilities. Specifically, construction of individual projects or phases of the CPHP, including the arrival or departure of construction vehicles and delivery of construction materials may inhibit vehicle, transit, bicycle and pedestrian movement and access both intermittently and through the duration of their construction if sidewalk and walkway closures, street closures, a temporary relocation of a transit stop, and bicycle route detours are required. They could also result in a temporary parking supply reduction, whether off- or on-street due to construction staging. Construction workers who drive to the site and potential temporary parking restrictions would cause a temporary increase in parking demand. Construction workers would park within UCSF parking garages, either in available or dedicated

parking spaces, in satellite parking lots in which UCSF would lease temporary parking spaces, or in temporary surface parking lots within undeveloped blocks. Additionally, certain roads within the campus site, such as Medical Center Way, are likely to be partially or fully closed for limited durations during construction, related to widening, regrading, and/or paving.

Prior to construction of certain phases or projects associated with the CPHP, UCSF and their construction contractor(s) would meet with San Francisco Public Works and SFMTA staff to develop and review truck routing plans and any required temporary roadway or sidewalk closures or detours. For any work in the public right-of-way, the construction contractor would be required to comply with the SFMTA *Blue Book*[23], including the regulations regarding sidewalk and lane closures, and would meet with SFMTA staff to determine if any special traffic permits would be required. Prior to construction, the project contractor would coordinate with Muni's Street Operations and Special Events Office to coordinate construction activities and reduce any impacts to transit operations. Additionally, any temporary traffic controls implemented as part of a construction project would be required to conform to the California Manual of Uniform Traffic Control Devices.

Although CPHP construction activities would be temporary, construction impacts would be considered potentially significant given the magnitude and duration of the CPHP and need for on-going coordination and monitoring. **CPHP Mitigation Measure TRANS-5** is set forth to reduce this impact to a less-than-significant level.

> **CPHP Mitigation Measure TRANS-5: Construction Coordination and Monitoring Measures**
>
> ***Construction Traffic Control Plan*** – In order to reduce potential conflicts between construction activities and pedestrians, transit and autos during construction activities at the Parnassus Heights campus site, UCSF shall require construction contractor(s) to prepare a traffic control plan for major phases of project construction (e.g., demolition, construction, or renovation of individual buildings). UCSF and their construction contractor(s) will meet with relevant City agencies to coordinate feasible measures to reduce traffic congestion, including temporary transit stop relocations (e.g., Parnassus Avenue) and other measures to reduce potential traffic and transit disruption and pedestrian circulation effects during major phases of construction of the CPHP projects. For any work within the public right-of-way, the contractor would also be required to comply with the City of San Francisco's *Regulations for Working in San Francisco Streets*, which establish rules and permit requirements so that construction activities can be done safely and with the least possible interference with pedestrians, bicyclists, transit, and vehicular traffic.
>
> ***Reduce Drive Alone Mode Share for Construction Workers*** – In order to minimize parking demand and vehicle trips associated with construction workers, UCSF shall require the construction contractor to include in the Construction Traffic Control Plan methods to encourage walking, bicycling, carpooling, and transit access to the campus site by construction workers.

[23] Available at https://www.sfmta.com/reports/construction-regulations-blue-book

Project Construction Updates for Adjacent Residents and Businesses – In order to minimize construction impacts on access for nearby residences, institutions, and businesses, UCSF shall provide nearby residences and businesses with regularly-updated information regarding project construction, including construction activities, peak construction vehicle activities (e.g., concrete pours, excavation),and travel lane closures via a newsletter, website, and/or quarterly construction update meetings with neighbors.

Significance after Mitigation: Less than Significant.

Irving Street Arrival, RAB, Initial Aldea Housing Densification Projects, and Initial Phase Improvements

It is estimated that construction activity associated with these Initial Phase projects and improvements would generate an average of 10 truck trips per day and as many as 50 trucks per day. Although construction activities associated with these Initial Phase projects and improvements would be temporary, construction impacts would be considered potentially significant given the need for on-going coordination and monitoring.

Mitigation: Implement CPHP Mitigation Measure TRANS-5.

Significance after Mitigation: Less than Significant.

Cumulative Impacts

Impact C-TRANS-1: The CPHP, in combination with past, present, and reasonably foreseeable future projects, would not result in a cumulatively considerable contribution to significant transportation impacts. (Less than Significant)

Cumulative transportation impacts consider those that would result from the implementation of the CPHP combined with other future land use and transportation changes anticipated to occur by 2050. The CPHP would be implemented over an approximately 30-year horizon, and would thus also be anticipated to occur by 2050. The CPHP's contribution to cumulative impacts may be considerable if it worsens or results in a significant cumulative impact. Cumulative transportation impacts in the project area may result from residential and commercial land use development projects that are reasonably expected to occur within the vicinity of the Parnassus Heights campus site, as well as changing travel patterns on transportation facilities within the vicinity of the Parnassus Heights campus site.

There are no identified land use development projects within the vicinity of the Parnassus Heights campus site or population change projections, which would result in traffic growth and/or changing travel patterns on transportation facilities within the vicinity of the Parnassus Heights campus site. As such, the discussions presented in Impacts TRANS-1 through TRANS-4 would be similar under cumulative conditions.

- The CPHP, in combination with past, present, and reasonably foreseeable future projects, would not result in a conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.
- The CPHP would not result in a conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b). The VMT per capita estimates presented in Impact TRANS-2 are well below the 2040 impact threshold.
- The CPHP, in combination with past, present, and reasonably foreseeable future projects, would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- The CPHP, in combination with past, present, and reasonably foreseeable future projects, would not result in inadequate emergency access.

Impact TRANS-5 describes temporary conditions during project construction, which would not be present under cumulative conditions with full project build out.

Mitigation: None required.

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4.16 Utilities and Service Systems

This section assesses the potential for development under the Comprehensive Parnassus Heights Plan (CPHP or Plan), including the three Initial Phase projects and Initial Phase improvements, to result in significant impacts on utilities and service systems. The section includes a description of the existing environmental setting as it relates to utility and service systems, and provides a regulatory framework that discusses applicable federal, State, and local regulations. The section presents the significance criteria used to evaluate impacts on utility and service systems, and the results of the impact assessment, including any significant impacts and associated mitigation measures.

4.16.1 Environmental Setting

Water

Water Supply

The San Francisco Public Utilities Commission (SFPUC) provides regional water services to approximately 2.6 million people in San Francisco, Santa Clara, Alameda, San Mateo, and Tuolumne Counties, including all of the City and County of San Francisco. Approximately 97 percent of the water provided to San Francisco is supplied by the SFPUC Regional Water System (RWS), which is made up of water from the Hetch Hetchy Reservoir and Bay Area reservoirs in the Alameda Creek and Peninsula watersheds. The remaining 3 percent is supplied by local water supplies, including recycled water, groundwater and non-potable water (SFPUC, 2016).

Regional Water System

Water from the Tuolumne River watershed stored in the Hetch Hetchy Reservoir accounts for 85 percent of the water supply delivered by the RWS, while the Alameda and Peninsula watersheds accounts for the remaining 15 percent. The RWS includes over 280 miles of pipelines, over 60 miles of tunnels, 11 reservoirs, five pump stations, and two water treatment plants, and currently delivers approximately 196 million gallons of water per day (mgd) to its customers (SFPUC, 2016).

Groundwater

A small portion of the San Francisco's water is obtained from locally-produced groundwater, which is used primarily for irrigation in local parks and on highway medians. San Francisco is located atop all or part of seven un-adjudicated groundwater basins. All of the basins, except the Westside and Lobos basins, are generally inadequate to supply a substantial amount of groundwater for municipal supply because of low yields (SFPUC, 2016).

The Westside Groundwater Basin is the largest groundwater basin in San Francisco. This basin is currently used to meet water demands for some irrigation and non-potable water needs in Golden Gate Park and the San Francisco Zoo. Six deep well pumping stations currently extract up to

4.0 mgd of water from the basin, which is then conveyed to in-City reservoirs for blending with the municipal drinking water supply (SFPUC, 2016).

Recycled Water

A small percentage of San Francisco's water is sourced from recycled water, which is used primarily for golf course irrigation in some parts of San Francisco. Presently recycled water provides about 0.3 mgd. Two planned recycled water projects will significantly increase the amount of recycled water available to City users. The Westside Recycled Water Project, which is currently under construction, will provide irrigation water to replace the existing groundwater and water from RWS used on the west side of the City. This project is expected to begin making deliveries in 2021 and will provide an annual average of 1.6 mgd. In addition, the Eastside Recycled Water Project will provide up to 2 mgd (annual average) of recycled water to portions of the east side of the City for non-potable irrigation, commercial, and industrial users (SFPUC, 2016).

Non-Potable Water

Alternate water sources (i.e., rainwater, storm water, greywater and blackwater) also now may be used in San Francisco for approved non-potable use. The Non-Potable Water Ordinance allows for the collection, treatment, and use of alternate water sources for non-potable applications. In July 2015, the ordinance was amended to mandate the installation of on-site water systems to treat and reuse available alternate water sources for toilet flushing and irrigation in new developments that meet specified criteria. The use of onsite alternate water sources serves to offset demands for potable water, with a cumulative projected potable-water offset of 0.4 mgd by 2040 (SFPUC, 2016). This potable-water offset is part of SFPUC's water supply portfolio in the 2015 Urban Water Management Plan (UWMP) for the City (see discussion of SFPUC's UWMP under *Regulatory Setting*, below).

Water Demand

The SFPUC serves water to both retail and wholesale customers, with about one third of its water supplies for retail customers (primarily located in San Francisco), including UCSF for use at its campus sites, and its remaining supplies reserved for 28 wholesale customers located in Alameda, Santa Clara, and San Mateo Counties, including the Groveland Community Services District.[1] Retail customers include the residents, businesses, and industries within the City as well as other customers such as the Town of Sunol, San Francisco International Airport, and the Lawrence Livermore National Laboratory, among others. Within the City, the SFPUC provides distribution and storage for water and fire protection for the local water system; this system includes 10 reservoirs, eight water tanks, 17 pump stations, and approximately 1,250 miles of transmission lines and water mains. In 2015, retail customers demanded 70.1 mgd, which was an historic low. Of this demand, in-City retail customers used approximately 65.6 mgd, of which 1.5 mgd was

[1] As reported in the SFPUC's 2015 *Urban Water Management Plan*, wholesale customers used about 128 mgd in 2015.

met with groundwater, and 0.2 mgd was met with recycled water, and the remainder was met with RWS supplies (SFPUC, 2016).

Water Supply Reliability

During normal precipitation years, the RWS is projected to have adequate water supplies to meet service area demands through 2040. In a single dry year, SFPUC projects to have sufficient supplies to meet demands for potable water through 2040; however, during a multiple-year drought, SFPUC would experience shortages in deliveries in 2040 without development of additional water supplies (SFPUC, 2016).

To address the reliability of its supplies, SFPUC has developed a Water System Improvement Plan (WSIP) and Water Shortage Allocation Plans (WSAP). These plans are discussed in further detail below.

Water System Improvement Program

In 2008, the SFPUC adopted the Phased Water System Improvement Program (WSIP) to ensure the ability of the regional water system to meet certain level of service goals for water quality, seismic reliability, delivery reliability, and water supply through 2018.[2] The SFPUC's level of service goals for regional water supply are to meet customer water needs in non-drought and drought periods and to meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide. In approving the WSIP, the SFPUC established a supply limitation of up to 265 mgd to be delivered from its water supply resources in the Tuolumne, Alameda and Peninsula watersheds in years with normal (average) precipitation.[3] The SFPUC's water supply agreement with its wholesale customers provides that approximately two-thirds of this total (up to 184 mgd) is available to wholesale purchasers and the remaining one-third (up to 81 mgd) is available to retail customers. The total amount of water the SFPUC can deliver to retail and wholesale customers in any one year depends on several factors, including the amount of water that is available from natural runoff, the amount of water in reservoir storage, and the amount of that water that must be released from the system for purposes other than customer deliveries (e.g., required instream flow releases below reservoirs). A "normal year" is based on historical hydrological conditions that allow the reservoirs to be filled by rainfall and snowmelt, allowing full deliveries to customers; similarly, a "wet year" and a "dry year" are based on historical hydrological conditions with above and below "normal" rainfall and snowmelt, respectively.

For planning purposes, the SFPUC uses a hypothetical drought that is more severe than what has historically been experienced. This drought sequence is referred to as the "design drought" and serves as the basis for planning and modeling of future scenarios. While the most recent drought (2012 through 2016) included some of the driest years on record for the SFPUC's watersheds, the design drought still represents a more severe drought in duration and overall water supply deficit.

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2 On December 11, 2018, the SFPUC Commission extended the timing of the WSIP water supply decision through 2028 in its Resolution No. 18-0212.

3 SFPUC Resolution No. 08-200, *Adoption of the Water System Improvement Program Phased WSIP Variant,* October 30, 2008.

Based on historical records of hydrology and reservoir inflow from 1920 to 2017, current delivery and flow obligations, and fully-implemented infrastructure under the WSIP, normal or wet years occurred 85 out of 97 years. This translates into roughly nine normal or wet years out of every 10 years. Conversely, system-wide rationing is required roughly one out of every 10 years. The frequency of dry years is expected to increase as climate change intensifies.

The WSIP aims to meet customer water needs in non-drought and drought conditions through the completion of defined improvements to the RWS that improve seismic, delivery, water quality, and water supply reliability for the RWS. The WSIP includes both local projects (located within San Francisco) and regional projects (spread over seven different counties from the Sierra foothills to San Francisco). As of March 31, 2020, 34 of the 35 local projects and 48 of the 52 regional projects have been completed; the remaining projects are under construction and are forecasted to be completed by May 2023.

Water Shortage Allocation Plans

Each year, SFPUC evaluates the amount of total water storage expected to occur throughout the RWS. If the evaluation finds the projected total water storage to be less than an identified level sufficient to provide sustained delivery during drought, then the SFPUC may impose delivery reductions or rationing in accordance with: (1) the Retail Water Storage Allocation Plan (RWSAP), which pertains to retail customers, and (2) the Wholesale Water Shortage Allocation Plan (WWSAP), which pertains to wholesale customers. Both plans provide specific allocations of the available water supply between the retail and wholesale customers collectively associated with varying system-wide shortages of up to 20 percent (SFPUC, 2016). The SFPUC last implemented customer water rationing during the most recent drought from 2014-2017.

Parnassus Heights Water Infrastructure

The existing domestic and fire water system on the Parnassus Heights campus site comprises distribution pipes, storage tanks, pump stations, valves, fire hydrants, and connections to the City's water system. A description of each of these systems is provided below.

Domestic Water System

Domestic water within the Parnassus Heights campus site is supplied from two water mains. A City-owned 8-inch-diameter domestic water main along Parnassus Avenue and 5th Avenue supplies domestic water to most of the buildings within the campus core on both sides of Parnassus Avenue. A City owned 12-inch diameter high pressure domestic water main along Clarendon Avenue supplies domestic water to buildings within the Aldea Housing complex, the Central Utility Plant (CUP), Moffitt Hospital, Medical Sciences, and Health Science Instruction Research (HSIR) East buildings. The high-pressure domestic water main also supplies the two domestic water tanks along Medical Center Way and the Forest Knolls Tank to the northwest of the Aldea Housing complex through the Forest Knolls Pump Station (UCSF, 2019).

Fire Water System

Fire water within the Parnassus Heights campus site is supplied from four water mains. The City-owned 8-inch-diameter domestic water main along Parnassus Avenue and 5th Avenue discussed

above supplies water to fire hydrants and sprinkler systems for buildings north of Parnassus Avenue, along 5th Avenue, and along Kirkham Street. The 12-inch-diameter high pressure domestic water main along Clarendon Avenue discussed above supplies water to the fire hydrants in the Aldea Housing complex, two fire water tanks on Mount Sutro along Medical Center Way, and to most of the major campus site buildings south of Parnassus Avenue. A 12-inch diameter Auxiliary Water Supply System[4] (AWSS) main along Parnassus Avenue serves as a secondary defense against fires if the municipal water supply system fails and supplies hydrants on the south side of Parnassus Avenue. Finally, a 30-inch-diameter domestic water main along Parnassus Avenue supplies one fire hydrant at the east end of the Parnassus Heights campus site (UCSF, 2019).

Wastewater / Stormwater

Parnassus Heights campus site straddles two City watershed basins. The west side of the Parnassus Heights campus site is located in the City's Sunset drainage basin within the larger Western Basin; and east side of the campus site is in the City's Channel drainage basin within the larger Eastern Basin.

The City's combined sewer system (CSS) is a network of pipes and tunnels that convey combined stormwater and sanitary sewage flows, referred to as combined sewer discharge, to City wastewater treatment plants. During non-storm conditions, the City's CSS collects and treats up to 80 mgd of wastewater, primarily municipal sewage.

The CSS routes flows to two treatment plants: the Southeast Treatment Plant (SEP) in the Bayview/Hunters Point neighborhood, and the Oceanside Treatment Plant (OSP) east of the Great Highway near the San Francisco Zoo. The SEP receives approximately 80 percent of the combined wastewater and stormwater flows from the city and discharges treated effluent to San Francisco Bay. On average, the SEP treats approximately 60 mgd of combined flows each day. During a rainstorm, the SEP has the capacity to treat up to 250 mgd of combined flows.

When the SEP reaches capacity, the North Point Wet Weather Facility (NPF), located on the north side of the City at 111 Bay Street, provides an additional 150 mgd of wet weather flows (San Francisco RWQCB, 2013). Treated effluent from this facility is discharged through four deep water outfalls, approximately 800 feet from the bay shoreline. Two of the deep water outfalls terminate at the end of Pier 33 and two terminate at the end of Pier 35 on the northeastern Bay shore.

The OSP treats the remaining 20 percent of flows from the west side of the City, including sewage flows from the entire Parnassus Heights campus site, and stormflows from the western half of the Parnassus Heights campus site. OSP has a dry weather capacity of 43 mgd. On an average day, the OSP treats approximately 17 mgd. During rain events, the wet-weather treatment capacity is 65 mgd (SFPUC, 2019a).

[4] The Auxiliary Water Supply System (AWSS) is a system of mains and high pressure fire hydrants, independent of the domestic water supply, built solely for the purpose of firefighting.

The CSS includes storage and transport boxes that, during wet weather, retain the combined stormwater and sewage flows that exceed the capacities of the SEP and the NPF for later treatment. The transport boxes connect to 36 combined sewer outfalls to the Bay (SFPUC, 2019c). When rainfall intensity results in combined flows that exceed the total capacity of the SEP, the NPF, and the storage and transport structures, the excess flows are discharged through the combined sewer discharge structures in compliance with NPDES permits. Citywide, discharges from these discharge structures receive "flow-through treatment," which is similar to primary treatment, to remove settleable solids and floatable materials. Wet weather flows are intermittent throughout the rainy season, and combined sewer overflow events vary in nature and duration depending largely on the intensity of individual rainstorms.

The Parnassus Heights campus site is served by public and private stormwater and combined sewer pipe networks of varying pipe size, material and condition. SFPUC's public combined sewers are located wholly within public streets, which receive effluent from UCSF's private combined sewer system (UCSF, 2019).

Electric and Natural Gas Facilities

Campus Core

The CUP provides electricity to the campus core along Parnassus Avenue through a 12.47 kilovolt (kV) distribution network. The CUP has two gas turbine generators nominally generating 5 megawatts (MW) each, and one steam turbine generator nominally generating 3.75 MW. As a result, the combined capacity of the CUP is 13.75 MW (UCSF, 2019).

Three separate Pacific Gas and Electric (PG&E) 12.47 kV feeders provide supplemental electricity to the campus core along Parnassus Avenue when necessary. In the event of a CUP outage, the PG&E service can pick up the demand without any power interruption to the campus site. The combined electrical capacity from the three PG&E connections is 22.5 MW, of which 15 MW is available at any one time (UCSF, 2019).

PG&E also provides natural gas service to the campus core from existing lines along Parnassus Avenue. Branch lines provide natural gas service to the CUP and individual buildings.

Aldea Housing Complex

The Aldea Housing complex is served by a PG&E 12.47 kV line located in Clarendon Avenue. PG&E also provides natural gas service to the Aldea housing complex from existing lines in the area.

Heating and Chilled Water Facilities

The CUP provides heating for the entire campus core via steam networks and cooling for only six campus site buildings (Clinical Sciences Building, Medical Science Building, Dolby Regeneration Medicine Building, Health Sciences Instruction and Research Towers West and East, and Parnassus Services Building). The remaining buildings have cooling systems (e.g., absorption chillers, rooftop units). Steam is distributed through three networks to the campus for

use in heating and process loads (e.g., sterilization). High pressure steam and low pressure steam are distributed to the majority of campus site buildings, while medium pressure steam is supplied to the clinical and medical buildings only. For Kalmanovitz Library, Moffitt Hospital, and Long Hospital, high pressure steam is used to power an absorption chiller for cooling. The chilled water system consists of 26-inch pipe secondary chilled water supply and return piping, which narrows in diameter as it extends to each served building (UCSF, 2019). Steam and chilled water are not provided to the Aldea Housing complex.

Telecommunications Facilities

The Parnassus Heights campus site is currently supplied with telecommunications services through various private companies. Typical telecommunications systems on campus include voice frequency, digital, fiber optic, wireless, Ethernet video over Internet Protocol, and voice over Internet Protocol. The infrastructure is located underground in vaults and conduits and aboveground on overhead power lines with pole mounted cable and transformers. Antennas are also mounted in towers or on roofs (UCSF, 2019).

Solid Waste Collection and Disposal

Recology provides solid waste collection, recycling, and disposal services for residential and commercial garbage, recycling, and composting in San Francisco. Solid waste in the City is collected and hauled to a transfer station near Candlestick Point and recycled as feasible. Recyclable materials are taken to Recology's Pier 96 facility, where they are separated into commodities (e.g., aluminum, glass, and paper) and transported to other users for reprocessing. Compostables (e.g., food waste, plant trimmings, and soiled paper) are transferred to a Recology composting facility in Solano County, where they are converted to soil amendment and compost. The remaining material that cannot otherwise be reprocessed ("trash") is transported to landfills.

In September 2015, the City approved an agreement with Recology, Inc., for the transport and disposal of the City's municipal solid waste at the Recology Hay Road Landfill in Solano County. The City began disposing its municipal solid waste at the landfill in January 2016, and that practice is anticipated to continue for approximately nine years, with an option to renew the agreement thereafter for an additional six years. The Hay Road Landfill has a permitted peak maximum daily disposal of 2,400 tons and an estimated remaining capacity of approximately 30.4 million cubic yards or 82 percent of its permitted capacity.[5] The estimated closure date of the landfill is 2077 (CalRecycle 2019a).

In 2018, San Francisco sent approximately 740,000 tons of solid waste to landfills, with, approximately 453,300 tons transported to Recology Hay Road Landfill, 74,500 tons to the Potrero Hills Landfill, 79,900 tons to the Corinda Los Trancos Landfill, and 70,500 tons to Altamont Landfill. The remaining approximate 61,900 tons of solid waste were transported to

[5] Tons is a unit of weight, and cubic yards is a unit of volume; conversion from one unit to other takes into account a density factor for the material.

24 other landfills. Together, the top four landfills used by San Francisco in 2018 have a remaining capacity of 131.9 million cubic yards (CalRecycle 2019b).

In 2018, UCSF generated approximately 7,300 tons of solid waste (not including construction and demolition [C&D] waste) at all campus sites. Of this amount, about 5,700 tons was diverted from the waste stream, resulting in a diversion rate of 78 percent.

4.16.2 Regulatory Framework

State Urban Water Management Plan

In 1983, the California Legislature enacted the Urban Water Management Planning Act (California Water Code Sections 10610 through 10656). The act states that every urban water supplier that provides water to 3,000 or more customers, or that provides over 3,000 acre-feet of water annually, should make every effort to ensure reliable water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry years. The act requires the urban water suppliers to prepare an Urban Water Management Plan (UWMP) and update it every five years. Details of the UWMP for the SFPUC are described below.

Water Supply Assessment

The State of California adopted Senate Bill 610 (SB 610) effective January 1, 2002. SB 610 requires cities and counties, when evaluating large development and redevelopment projects, to request an assessment of the availability of water supplies from the water supply entity that will provide water to a project. The Water Supply Assessment (WSA) is performed in conjunction with the land use approval process associated with a project and must include an evaluation of the sufficiency of the water supplies available to the water supplier to meet existing and future demands, including the demand for a project over a 20-year time period that includes normal, single-dry, and multiple dry years.

When a new development project is accounted for in the demand projections of an UWMP, the WSA can refer to the UWMP and no further analysis is necessary. The SFPUC allows for all development projects requiring a WSA under SB 610 to rely solely on the SFPUC's adopted UWMP without having to prepare individual WSAs.

Water Code Section 10910 and 14 CCR 15155 (entitled "City or County Consultation with Water Agencies") apply only to cities and counties. Water Code Section 10910(a) states: "Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part."

2018 Bay-Delta Plan Amendment

In December 2018, the State Water Resources Control Board adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, which establishes water quality objectives to maintain the health of the rivers and the Bay-Delta

ecosystem.[6] Among the goals of the adopted Bay-Delta Plan Amendment is to increase salmonid populations in the San Joaquin River, its tributaries (including the Tuolumne River), and the Bay-Delta. Specifically, the plan amendment requires increasing flows in the Stanislaus, Tuolumne, and Merced Rivers to 40 percent of unimpaired flow[7] from February through June every year, whether it is wet or dry. During dry years, this would result in a substantial reduction in the SFPUC's water supplies from the Tuolumne River watershed (see additional detail below).

RWQCB Permits

The Porter-Cologne Water Quality Control Act authorizes the SWRCB, which, in turn, delegated certain authority to the several Regional Water Quality Control Boards (RWQCB) to issue and enforce NPDES permits. In addition, the SWRCB develops water quality standards and performs other functions to protect California's waters. The RWQCBs, pursuant to their delegated powers, carry out the SWRCB regulations and standards as well as issue and enforce permits. The SEP, the NPF, and all of the Bayside wet-weather facilities are covered by an NPDES permit (Regional Water Quality Control Board Order No. R2-2013-0029) adopted by the San Francisco Bay RWQCB in August 2013 while the OSP is covered by a separate NPDES permit (Regional Water Quality Control Board Order No. R2-2019-0028) adopted by the San Francisco Bay RWQCB in September 2019. See Section 4.8, *Hydrology and Water Quality*, for further discussion of NPDES permits.

Assembly Bill 939 and Senate Bill 1016

The California Integrated Waste Management Act of 1989, or Assembly Bill 939, established the Integrated Waste Management Board, required the implementation of integrated waste management plans, and mandated that local jurisdictions divert at least 50 percent of all solid waste generated (from 1990 levels), beginning January 1, 2000, and divert at least 75 percent by 2010. Projects that would have an adverse effect on waste diversion goals are required to include waste diversion mitigation measures to assist in reducing these impacts to less-than-significant levels. With the passage of Senate Bill 1016 (the Per Capita Disposal Measurement System) in 2006, only per capita disposal rates are measured to determine if a jurisdiction's efforts are meeting the intent of Assembly Bill 939.

University of California

UC Sustainable Practices Policy

The UC Sustainable Practices Policy, developed in 2004 and updated as recently as 2019, establishes goals in 10 areas of sustainable practices for both individual building projects and overall facilities operations: green building design, clean energy, transportation, climate protection, sustainable building operations, waste reduction and recycling, environmentally preferable purchasing, sustainable foodservice, sustainable water systems, and sustainability at UC Health locations (UCOP, 2019). Most relevant to this discussion are the goals and policies

[6] State Water Resources Control Board Resolution No. 2018-0059, *Adoption of Amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary and Final Substitute Environmental Document,* December 12, 2018, available at https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.

[7] "Unimpaired flow" represents the water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds.

related to energy use (i.e., green building design, clean energy, sustainable building operations), solid waste (i.e., waste reduction and recycling), water supply (i.e., sustainable water systems), and sustainability at UCSF locations.

Specifically, with regard to green building design, UCSF is committed to meeting UC system–wide goals of achieving LEED Silver certification or better for all new buildings and LEED certification (not necessarily Silver) for all major renovations. The policy also requires that all new non-acute care facilities or major renovation projects outperform California Energy Code, Title 24, requirements by at least 20 percent and strive to outperform the requirements by 30 percent. UCSF saves millions of gallons of potable water annually through implementation of a comprehensive Water Action Plan, which outlines the campus's methods for reducing dependence on potable water and identifies broader opportunities for water conservation (UCSF, 2018). Development on the Parnassus Heights campus site must comply with the goals set forth in the Water Action Plan. The UC Sustainable Practices Policy identifies the goal of a 20 percent reduction in growth-adjusted potable water consumption by 2020 and 36 percent by 2025 (compared to a 3-year average baseline of FY 2005–06, FY 2006–07, and FY 2007–08) (UCOP, 2019).

The UC produces an annual report to track its progress toward achieving the system-wide goal of sustainability by 2025. The annual report outlines ongoing progress of the UC's comprehensive sustainability program, including advancement in all areas of the UC Sustainable Practices Policy; research and education; Presidential Initiatives; and student, faculty, and staff engagement.

UCSF 2014 LRDP

The UCSF 2014 LRDP included *Community Planning Principles*, which were produced in collaboration with the UCSF Community Advisory Group:

Community Planning Principles

Sustainability

S1. Meet or exceed guidelines and standards in the University of California's Sustainable Practices Policy when planning and developing projects. Policy goals are categorized as follows: Green Building; Clean Energy; Climate Protection Practices (including greenhouse gas reduction); Sustainable Transportation; Sustainable Building Operations; Recycling and Waste Management; Environmentally Preferable Purchasing Practices; Sustainable Foodservices Practices.

City of San Francisco

2015 Urban Water Management Plan

The current urban water management plan for the City and County of San Francisco is the 2015 Urban Water Management Plan.[8] The 2015 plan presents information on the SFPUC's retail and wholesale service areas, the RWS and other water supply systems operated by the SFPUC,

[8] San Francisco Public Utilities Commission, *2015 Urban Water Management Plan for the City and County of San Francisco*, June 2016. This document is available at https://sfwater.org/index.aspx?page=75.

system supplies and demands, water supply reliability, Water Conservation Act of 2009 compliance, water shortage contingency planning, and water demand management.

The water demand projections in the 2015 UWMP reflect anticipated population and employment growth, socioeconomic factors, and the latest conservation forecasts. The 2015 UWMP presents water demand projections in five-year increments over a 25-year planning horizon through 2040. The plan compares anticipated water supplies to projected demand through 2040 for normal, single-dry, and multiple-dry water years. Retail water supplies are comprised of RWS, groundwater, recycled water, and non-potable water. Under normal hydrologic conditions, the total retail supply is projected to increase from 70.1 mgd in 2015 to 89.9 mgd in 2040. According to the plan, available and anticipated future water supplies would fully meet projected demand in San Francisco through 2040 during normal years.

Based on the 2015 UWMP, as modified by a 2018 amendment to the 2009 Water Supply Agreement,[9] sufficient retail water supplies would be available to serve projected growth in San Francisco through 2040. While concluding supply is sufficient, the 2015 UWMP also identifies projects that are underway or planned to augment local supply. Projects that are underway or recently completed include the San Francisco Groundwater Supply Project and the Westside Recycled Water Project. A more current list of potential regional and local water supply projects that the SFPUC is considering is provided below under *Additional SFPUC Water Supplies*.

In addition, the 2015 UWMP describes the SFPUC's ongoing efforts to improve dry-year water supplies, including participation in Bay Area regional efforts to improve water supply reliability through projects such as interagency interties, groundwater management and recharge, potable reuse, desalination, and water transfers. While no specific capacity or supply has been identified, this program may result in future supplies that would benefit SFPUC customers.

Relationship of Bay-Delta Plan Amendment to SFPUC Water Supply

The SWRCB approved the Bay-Delta Plan Amendment in December 2018. If the Bay-Delta Plan Amendment is implemented, the SFPUC would be able to meet the projected retail water demands presented in the 2015 UWMP in normal years but would experience supply shortages in single dry years and multiple dry years. Implementation of the Bay-Delta Plan Amendment would result in substantial dry-year water supply shortfalls throughout the SFPUC's RWS service area, including San Francisco. The 2015 UWMP assumes limited rationing for retail customers may be needed in multiple dry years to address an anticipated supply shortage by 2040; the 2018 amendment to the 2009 Water Supply Agreement with wholesale customers (described above) would slightly increase rationing levels indicated in the 2015 UWMP. By comparison, implementation of the Bay-Delta Plan Amendment would result in supply shortfalls in all single dry years and multiple dry years and rationing to a greater degree than previously anticipated to

[9] SFPUC, Resolution No. 18-0212, December 11, 2018. The SFPUC amended its 2009 Water Supply Agreement between the SFPUC and its wholesale customers, revising Tier 1 allocation in the Water Supply Allocation Plan to require a minimum reduction of 5 percent of the regional water system supply for San Francisco retail customers whenever system-wide reductions are required due to dry-year supply shortages.

address supply shortages not accounted for in the 2015 UWMP or as a result of the 2018 amendment to the Water Supply Agreement.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment by the year 2022, assuming all required approvals are obtained by that time. However, at this time, the implementation of the Bay-Delta Plan Amendment is uncertain for several reasons. First, under the federal Clean Water Act, the United States Environmental Protection Agency (USEPA) must approve the water quality standards identified in the plan amendment. It is uncertain what determination the USEPA will make and its decision could result in litigation.

Second, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in state and federal court, challenging the water board's adoption of the plan amendment, including legal challenges filed by the federal government at the request of the U.S. Bureau of Reclamation. That litigation is in the early stages, and there have been no dispositive court rulings as of this date.

Third, the Bay-Delta Plan Amendment is not self-executing and does not allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the plan amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, the Clean Water Act, section 401 certification process in the Federal Energy Regulatory Commission's relicensing proceeding for Don Pedro Dam. The license amendment process is currently expected to be completed in the 2022–2023 timeframe. This process and other regulatory and/or adjudicatory proceeding would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility for the Tuolumne River than currently exists (and therefore a different water supply effect on the SFPUC).

Fourth, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, the SWRCB directed its staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the [water board] as early as possible after December 1, 2019." In accordance with the water board's instruction, on March 1, 2019, the SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary agreement with the state water board that would serve as an alternative path to implementing the Bay-Delta Plan's objectives. On March 26, 2019, the SFPUC adopted Resolution No. 19-0057 to support its participation in the voluntary agreement negotiation process. To date, those negotiations are ongoing.

For these reasons, whether, when, and the form in which the Bay-Delta Plan Amendment will be implemented, and how those amendments will affect the SFPUC's water supply, is currently unknown.

Additional SFPUC Water Supplies

In light of the adoption of the Bay-Delta Plan Amendment and the resulting potential limitation to the SFPUC's RWS supply during dry years, the SFPUC is expanding and accelerating its efforts to develop additional water supplies and explore other projects that would improve overall water supply resilience. Developing these supplies would reduce water supply shortfalls and reduce rationing associated with such shortfalls. The SFPUC has taken action to fund the study of additional water supply projects, listed below:

- Daly City Recycled Water Expansion
- Alameda County Water District Transfer Partnership
- Brackish Water Desalination in Contra Costa County
- Alameda County Water District-Union Sanitary District Purified Water Partnership
- Crystal Springs Purified Water
- Eastside Purified Water
- San Francisco Eastside Satellite Recycled Water Facility
- Additional Storage Capacity in Los Vaqueros Reservoir from Expansion
- Calaveras Reservoir Expansion

The capital projects that are under consideration would be costly and are still in the early feasibility or conceptual planning stages. These projects would take 10 to 30 or more years to implement and would require environmental permitting negotiations, which may reduce the amount of water that can be developed. The yield from these projects is unknown and not currently incorporated into SFPUC's supply projections.

In addition to capital projects, the SFPUC is also considering developing related water demand management policies and ordinances, such as funding for innovative water supply and efficiency technologies and requiring potable water offsets for new developments.

4.16.3 Impacts and Mitigation Measures

Significance Criteria

Would implementation of the CPHP, including the three Initial Phase projects and Initial Phase improvements:

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

e) Comply with federal, State, and local management and reduction statutes and regulations related to solid waste?

Approach to Analysis

The environmental impact analysis for utilities and service systems begins with an assessment of existing utility use and infrastructure services at the Parnassus Heights campus site. The projected demands for utilities and infrastructure services generated are then calculated and compared to existing usage to estimate the net increase resulting from implementation of the proposed CPHP. Typically, utility assessments focus on supply, treatment or generation capacity and distribution or collection infrastructure requirements. For each potential utility, the analysis compares the net increase resulting from implementation of the proposed CPHP against the significance criteria set forth above. If the impact would be significant, the analysis identifies feasible mitigation measures that would eliminate the impact or reduce it to a less-than-significant level. If the impact cannot be reduced to a less-than-significant level after implementation of all feasible mitigation measures, then it would remain significant and unavoidable.

As UCSF is neither a city nor a county it is not subject to SB 610. However, UCSF has voluntarily elected to prepare a WSA-like document, a Water Supply Evaluation (WSE), to determine and demonstrate the sufficiency of the SFPUC's water supplies to satisfy the water demand of the planned development at the Parnassus Heights campus site under the 2014 LRDP and CPHP (see **Appendix WSE**).

Approach to Analysis of Initial Phase Projects, including New Hospital, and Initial Phase Improvements

This EIR includes project-level analysis for certain Initial Phase projects anticipated to be completed by about the year 2030; specifically, the Irving Street Arrival, Research and Academic Building (RAB), and initial Aldea Housing Densification; and Initial Phase improvements, as described below. The New Hospital is also an Initial Phase project anticipated to be completed by about the year 2030, but is analyzed at a program level in this EIR within the context of the overall CPHP, and will be analyzed at a project level in a subsequent EIR when more details are available.

Impact Analysis

Impact UTIL-1: Implementation of the proposed CPHP would require or result in the construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects. (Less than Significant)

CPHP

Utility infrastructure improvements are required both within the Parnassus Heights campus core and within the Aldea Housing complex to maintain existing systems and to serve future growth under the proposed CPHP. The domestic and emergency water, waste wastewater/stormwater,

electric and natural gas, heating and chilled water, and/or telecommunications utility infrastructure improvements required to serve the net new development envisioned by the proposed CPHP are summarized in Chapter 3, *Project Description*.

Construction activities associated with the utility improvements described above would have the potential to result in significant or potentially significant impacts. However, compliance with mitigation measures and other construction-related regulatory requirements discussed in other sections of this EIR, including Section 4.2, *Air Quality*; Section 4.3, *Biological Resources*; Section 4.4, *Cultural Resources*; Section 4.6, *Geology and Soils*; Section 4.8, *Hazards and Hazardous Materials*; Section 4.9, *Hydrology and Water Quality*; Section 4.11, *Noise and Vibration*; and Section 4.15, *Transportation*, would reduce construction-related effects associated with utility improvements to a less than significant level. As a result, the impacts associated with the construction of new utilities to serve the proposed CPHP would be less than significant.

Mitigation: None required.

Irving Street Arrival

The Irving Street Arrival project is intended to better facilitate entry onto the campus from Irving Street. Utility demand associated with this project would be limited to electricity to power lights and equipment for proposed vertical circulation improvements. As a result, the utility demand associated with this project is not anticipated to be substantial enough to require the relocation or construction of new or expanded utility infrastructure, and this impact is considered less than significant.

Mitigation: None required.

Research and Academic Building

As discussed above, utility infrastructure improvements are required on the campus site to serve future development allowed under the proposed CPHP, including the proposed RAB. Compliance with mitigation measures and other construction-related regulatory requirements discussed in other sections of the EIR, including Section 4.2, *Air Quality*; Section 4.3, *Biological Resources*; Section 4.4, *Cultural Resources*; Section 4.6, *Geology and Soils*; Section 4.8, *Hazards and Hazardous Materials*; Section 4.9, *Hydrology and Water Quality*; Section 4.11, *Noise and Vibration*; and Section 4.15, *Transportation*, would reduce construction-related effects associated with utility improvements to a less than significant level. As a result, the impacts associated with the construction and expansion of new utilities to serve the RAB would be less than significant.

Mitigation: None required.

Initial Aldea Housing Densification

UCSF estimates the existing fire and domestic water lines, combined storm sewer lines, and electrical lines serving the Aldea Housing complex, which are located outside of the complex, have sufficient capacity to serve future development within the area. However, improvements to some utility infrastructure within the Aldea Housing complex would be required to serve the proposed new development at the Aldea Housing complex. A new booster pump station may be

installed to improve water pressure in the Aldea Housing complex. In addition, modeling analysis conducted by UCSF in support of the CPHP indicated that several combined storm sewer lines within the Aldea Housing complex may need to be replaced due to insufficient existing and future capacity (UCSF 2019). Compliance with mitigation measures and other construction-related regulatory requirements discussed in other sections of the EIR, including Section 4.2, *Air Quality*; Section 4.3, *Biological Resources*; Section 4.4, *Cultural Resources*; Section 4.6, *Geology and Soils*; Section 4.8, *Hazards and Hazardous Materials*; Section 4.9, *Hydrology and Water Quality*; Section 4.11, *Noise and Vibration*; and Section 4.15, *Transportation*, would reduce construction-related effects associated with utility improvements to a less than significant level. As a result, the impacts associated with the construction and expansion of new utilities to serve the initial Aldea Housing Densification project would be less than significant.

Mitigation: None required.

Initial Phase Improvements

As described in Chapter 3, *Project Description*, the Initial Phase improvements would include various Initial Phase utility improvements, implementation of the Parnassus Avenue Streetscape Plan, renovation of certain existing buildings, and installation of miscellaneous community investments in the public realm. Compliance with mitigation measures and other construction-related regulatory requirements discussed in other sections of the EIR, including Section 4.2, *Air Quality*; Section 4.3, *Biological Resources*; Section 4.4, *Cultural Resources*; Section 4.6, *Geology and Soils*; Section 4.8, *Hazards and Hazardous Materials*; Section 4.9, *Hydrology and Water Quality*; Section 4.11, *Noise and Vibration*; and Section 4.15, *Transportation*, would reduce construction-related effects associated with these improvements to a less than significant level. As a result, the impacts associated with the construction and expansion of utilities associated with the new Initial Phase improvements would be less than significant.

Mitigation: None required.

Impact UTIL-2: Sufficient water supply would be available from existing entitlements and resources to serve development under the proposed CPHP under normal, dry and multi-dry years if the Bay Delta Plan Amendment is implemented. If the Bay Delta Plan Amendment is implemented, the SFPUC may address the shortfalls through rationing and/or develop new or expanded water supply facilities to address shortfalls in single and multiple dry years. The CPHP would not make a considerable contribution to impacts from increased rationing or from the development of new supply sources. (Less than Significant)

CPHP

Implementation of the CPHP would result in an increased demand for water at the Parnassus Heights campus site, which is supplied to the campus by the SFPUC. The analysis herein evaluates whether: (1) sufficient water supplies are available to serve the proposed CPHP and reasonably foreseeable future development in normal, dry, and multiple dry years, and (2) the proposed CPHP would require or result in the relocation or construction of new or expanded water supply facilities, the construction or relocation of which would have significant environmental impacts.

As described earlier in this section, the supply capacity of the Hetch Hetchy RWS that provides the majority of the city's drinking water far exceeds the potential demand of any single development project in San Francisco. No single development project alone in San Francisco would require the development of new or expanded water supply facilities or require the SFPUC to take other actions, such as imposing a higher level of rationing across the city in the event of a supply shortage in dry years. Therefore, a separate project-only analysis is not provided for this topic. The following analysis instead considers whether the proposed CPHP in combination with both existing development and projected growth through 2040 would be served by existing and planned supplies or would require new or expanded water supply facilities, the construction or relocation of which could have significant cumulative impacts on the environment. It also considers whether a high level of rationing would be required that could have significant cumulative impacts. Further, due to the recent 2018 Bay Delta Plan Amendments that were previously discussed, the analysis below considers the CPHP related water demand under three water supply scenarios.

Estimated CPHP Water Demand

UCSF is an in-City retail customer and purchases all of its water supplies from the SFPUC. Based on 2018 data, existing development on the Parnassus Heights campus site currently demands approximately 0.32 million gallons per day (mgd) of water. Implementation of the CPHP would result in a net increase of about 2 million gsf of building space at the campus site. As a result of this increase in building space, water demand at the Parnassus Heights campus site is projected to increase by approximately 0.20 mgd, and the total future water demand for the Parnassus Heights campus site at full development under the CPHP is projected to be approximately 0.52 mgd by 2050. This projected water demand conservatively does not take into consideration ongoing projects by UCSF to reduce water demands at the Parnassus Heights campus site. Over the past 10 years, potable water demand at the Parnassus Heights campus site has decreased from a maximum of 0.56 mgd in FY 2010/11 to 0.33 mgd in FY 2018/19 as a result of the UCSF Water Action Plan. With full implementation of the ongoing water conservation projects described in the UCSF Water Action Plan, it is estimated that UCSF would reduce the existing FY 2018/19 water demand by about 20 percent, not including the demand from the proposed CPHP. Further, full development under the proposed CPHP is anticipated to occur by 2050. The SFPUC's 2015 UWMP provides supply and demand projections through 2040. In the absence of projections that go out to 2050, the CPHP's 2050 incremental water demand is compared to the SFPUC's 2040 supply and demand. This provides for a conservative analysis as the campus site water demand in 2040 actually would be lower than the amount analyzed in this section.

The total Parnassus Heights campus site water demand (0.52 mgd) as a result of the proposed CPHP represents a small fraction (0.6 percent) of SFPUC's overall 2040 total retail demand which is projected to be about 89.9 mgd. If the incremental demand (0.20 mgd) due to the CPHP is compared to the SFPUC 2040 total retail demand, it would represent an even smaller fraction (about 0.2 percent). If the 20 percent reduction in existing use is factored in, the increase in demand would be 0.13 mgd which would represent about 0.14 percent of the total retail demand in 2040. Further, some of the incremental water demand at the Parnassus Heights campus site is likely included in SFPUC's 2040 demand projections. However, even if all of the incremental

water is considered not accounted for, it represents a very small amount when compared to the extensive RWS which is capable of supplying up to almost 90 mgd.

Impact Analysis

As discussed above in *Section 4.16.2, Regulatory Framework*, with the adoption of the Bay-Delta Plan Amendment by the SWRCB in 2018, a substantial amount of uncertainty regarding future water supplies was created. It is uncertain as to whether, when, and the form in which the Bay-Delta Plan Amendment will be implemented, and how those amendments will affect the SFPUC's water supply. Three scenarios are set forth below to characterize potential future water supply scenarios and the CPHP's demand is analyzed for its impact in the context of these potential scenarios.

Scenario 1 – Current Water Supply. Scenario 1 assumes no change to the way in which water is supplied, and that neither the Bay-Delta Plan Amendment nor a Bay-Delta Plan Voluntary Agreement would be implemented. Thus, the water supply and demand assumptions contained in the 2015 Urban Water Management Plan, as amended by the 2009 Water Supply Agreement, would remain applicable to new development to be served by SFPUC. As discussed above, the incremental increase in water needed at the Parnassus Heights campus site would be on the order of 0.13 to 0.2 mgd and would represent a very small fraction (0.14 to 0.2 percent) of the total demand and supply in 2040. Under this scenario, water supplies would be available to meet the demand of the proposed CPHP in combination with existing development and projected growth in all years, except for a 5- to 7-percent shortfall during dry years through the year 2040. This relatively small shortfall is primarily due to implementation of the amended 2009 Water Supply Agreement. To manage a small shortfall such as this, the SFPUC may prohibit certain discretionary outdoor water uses and/or call for voluntary rationing by its retail customers, including UCSF. This level of rationing is well within the SFPUC's RWS supply level of service goal of limiting rationing to no more than 20 percent on a system-wide basis. Further, under this scenario, while SFPUC may choose to develop new water sources, the SFPUC would not be required to develop new or expanded water supply facilities to serve the projected growth in demand and there would be no significant cumulative environmental impacts from the development of new supplies. The impact would be less than significant.

Scenario 2 – Bay-Delta Plan Voluntary Agreement. Under Scenario 2, a voluntary agreement would be implemented as an alternative to the adopted Bay-Delta Plan Amendment. The March 1, 2019, proposed voluntary agreement submitted to the SWRCB has yet to be accepted, and the shortages that would occur with its implementation are not known. The voluntary agreement proposal contains a combination of flow and non-flow measures that are designed to benefit fisheries at a lower water cost, particularly during multiple dry years, than would occur under the Bay-Delta Plan Amendment. The resulting RWS supply shortfalls during dry years would be less than those under the Bay-Delta Plan Amendment and would require rationing of a lesser degree and closer in alignment to the RWS supply level of service goal of rationing of no more than 20 percent system-wide during dry years. The SFPUC Resolution No. 19-0057, which authorized the SFPUC staff to participate in voluntary agreement negotiations, stated its intention that any final voluntary agreement allow the SFPUC to maintain both the water supply and sustainability level of service goals and objectives adopted by the SFPUC when it approved the

WSIP. Accordingly, it is reasonable to conclude that if the SFPUC enters into a voluntary agreement, the supply shortfall under such an agreement would be of a similar magnitude to the shortfall that would occur under Scenario 1. The effect of Scenario 2 cannot be quantified at this time but as noted above, if it can be designed to achieve the SFPUC's level of service goals and is adopted, it would be expected to have effects similar to Scenario 1.

Scenario 3 – Bay-Delta Plan Amendment. Under Scenario 3, the 2018 Bay-Delta Plan Amendment would be implemented as it was adopted by the SWRCB without modification. As discussed above, there is considerable uncertainty whether, when, and in what form the plan amendment will be implemented. However, because implementation of the plan amendment cannot be ruled out at this time, an analysis of the cumulative impact of projected growth on water supply resources under this scenario is included in this document to provide a worst-case impact analysis.

Under this scenario, which is assumed to be implemented after 2022, water supplies would be available to meet projected demands through 2040 in wet and normal years with no shortfalls. However, implementation of the Bay-Delta Plan Amendment would result in a shortfall beginning in years two and three of multiple dry-years in 2025 of 33.2 percent, and dry year shortfalls by 2040 ranging from 23.4 percent in a single dry year and year one of multiple dry years to up to 49.8 percent in years seven and eight of the 8.5-year design drought. Existing and planned dry-year supplies would be insufficient for the SFPUC to satisfy its RWS supply level of service goal of no more than 20 percent rationing system-wide. The Water Shortage Allocation Plan does not specify allocations to retail supply during system-wide shortages above 20 percent. However, the plan indicates that if a system-wide shortage greater than 20 percent were to occur, the RWS supply would be allocated among retail and wholesale customers per the rules corresponding to a 16- to 20-percent system-wide reduction, subject to consultation and negotiation between the SFPUC and its wholesale customers to modify the allocation rules. Based on these allocation rules, shortfalls of 15.6 to 49.8 percent across the retail service area as a whole are estimated under Scenario 3. Significant dry-year shortfalls would occur in San Francisco, regardless of whether or not the proposed CPHP is implemented.

It is anticipated that should the Bay-Delta Plan Amendment be implemented, the SFPUC will increase and accelerate its efforts to develop additional water supplies and explore other projects that would increase overall water supply resilience. The SFPUC has identified possible projects that it will study. The SFPUC is beginning to study water supply options, but it has not determined the feasibility of the possible projects, has not made any decision to pursue any particular supply projects, and has determined that the identified potential projects would take anywhere from 10 to 30 years or more to implement. There is also a substantial degree of uncertainty associated with the implementation of the Bay-Delta Plan Amendment and its ultimate outcome, and therefore, there is substantial uncertainty in the amount of additional water supply that may be needed, if any. Moreover, there is uncertainty and lack of knowledge as to the feasibility and parameters of the possible water supply projects the SFPUC is beginning to explore. Consequently, the physical environmental impacts that could result from future supply projects would be speculative at this time and would not be expected to be reasonably determined for a period of time ranging from 10 to 30 years. Although it is not possible at this time to

identify the specific environmental impacts that could result, this analysis assumes that if new or expanded water supply facilities, such as those listed above under "Additional Water Supplies," were developed, the construction and/or operation of such facilities could result in significant adverse environmental impacts, and this would be a significant cumulative impact.

As discussed above, the proposed CPHP's incremental water demand would represent between 0.14 to 0.2 percent of total demand in San Francisco in 2040, whereas implementation of the Bay Delta Plan Amendment would result in a retail supply shortfall of up to 49.8 percent. Thus, new or expanded dry-year water supplies would be needed under Scenario 3 regardless of whether the proposed CPHP is implemented. As such, any physical environmental impacts related to the construction and/or operation of new or expanded water supplies would occur with or without the proposed CPHP. Therefore, the proposed CPHP would not have a considerable contribution to any significant cumulative impacts that could result from the construction or operation of new or expanded water supply facilities developed in response to the Bay-Delta Plan Amendment.

Given the long lead times associated with developing additional water supplies, in the event the Bay-Delta Plan Amendment were to take effect sometime after 2022 and result in a dry-year shortfall, the expected action of the SFPUC for the next 10 to 30 years (or more) would be limited to requiring increased rationing. The analysis below focuses on whether rationing at the levels that might be required under the Bay-Delta Plan Amendment could result in any cumulative impacts, and if so, whether the CPHP would make a considerable contribution to these impacts.

The SFPUC has established a process through its Retail Water Shortage Allocation Plan for actions it would take under circumstances requiring rationing. Rationing at the level that might be required under the Bay-Delta Plan Amendment would require changes to how businesses operate, changes to water use behaviors (e.g., shorter and/or less-frequent showers), and restrictions on irrigation and other outdoor water uses (e.g., car washing), all of which could lead to undesirable socioeconomic effects. However, any such effects would not constitute physical environmental impacts under CEQA.

High levels of rationing could, however, lead to adverse physical environmental effects, such as the loss of vegetation cover resulting from prolonged restrictions on irrigation. Prolonged high levels of rationing within the city could also make San Francisco a less desirable location for residential and commercial development compared to other areas of the state not subject to such substantial levels of rationing, which, depending on location, could lead in turn to increased urban sprawl. Sprawl development is associated with numerous environmental impacts, including, for example, increased greenhouse gas emissions and air pollution from longer commutes and lower density development, higher energy use, loss of farmland, and increased water use from less water-efficient suburban development.[10] Thus, the higher levels of rationing on a citywide basis that could be required under the Bay-Delta Plan Amendment could lead directly or indirectly to significant cumulative impacts. The question, then, is whether the CPHP would make a considerable contribution to impacts that may be expected to occur in the event of high levels of rationing.

[10] Pursuant to the SFPUC 2015 Urban Water Management Plan, San Francisco's per capita water use is among the lowest in the state.

As discussed above, implementation of the Bay-Delta Plan Amendment would result in substantial system-wide water supply shortfalls in dry years. These shortfalls would occur with or without the proposed CPHP, and the CPHP's incremental increase in potable water demand (0.16 to 0.2 percent of total retail demand) would have a negligible effect on the levels of rationing that would be required throughout San Francisco under Scenario 3 in dry years. Furthermore, UCSF would also comply with the SFPUC's directives related to rationing. Thus, the proposed CPHP would not make a considerable contribution to any significant cumulative impacts that may result from increased rationing that may be required with implementation of the Bay-Delta Plan Amendment, were it to occur.

Therefore, for the reasons described above, under all three water supply scenarios, this impact would be considered less than significant.

Mitigation: None required.

Irving Street Arrival

The Irving Street Arrival project is intended to better facilitate entry onto the campus site from Irving Street. As this improvement is limited to the reconfiguration of interior space and new exterior treatments, no increase in demand for water would occur, and thus no impact with respect to water supply would occur.

Mitigation: None required.

Research and Academic Building

The WSE estimated that the net change is water demand associated with the RAB would be approximately 3,660 gallons per day. As this water demand generation is a sub-set of total water demand that would occur under the proposed CPHP, water demand associated with the RAB would also not be substantial and the project could be served by existing and planned supplies under normal, single dry, and multiple dry years through 2040 under Scenarios 1 and 2, and would be subject to increased rationing under Scenario 2. For the same reasons set forth above, this impact of the RAB project would be less than significant.

Mitigation: None required.

Initial Aldea Housing Densification

The WSE estimated that the net change in water demand associated with the initial Aldea Housing Densification project would be approximately 10,000 gallons per day. As this water demand is a sub-set of total water demand that would occur under the proposed CPHP, water demand associated with the initial Aldea Housing densification project would also be served by existing supplies under normal, single dry, and multiple dry years through 2040 under Scenarios 1 and 2, and would be subject to increased rationing under Scenario 3. For the same reasons set forth above, this impact of the initial Aldea Housing Densification project would be less than significant.

Mitigation: None required.

Initial Phase Improvements

The Initial Phase improvements include certain potable water conveyance improvements, heating and chilled water conveyance improvements, and new water tanks to better accommodate water demands of CPHP development, but the Initial Phase improvements are not in and of themselves a notable source of water demand. Consequently, the Initial Phase improvements would not result in a significant impact with respect to water supply, and the impact would be less than significant.

Mitigation: None required.

Impact UTIL-3: The wastewater treatment provider would have adequate wastewater treatment capacity to serve campus development under the proposed CPHP. (Less than Significant)

CPHP

Assuming wastewater generation as 90 percent of water usage, the overall increase in wastewater resulting from the 2.0 million gsf net increase of building space associated with the proposed CPHP would be roughly 0.18 mgd. Wastewater flows from the Parnassus Heights campus site would be directed to the OSP. The OSP has a dry weather capacity of 43 mgd and is currently treating approximately 17 mgd. Therefore, based on current sewage flows, the plant has about 26 mgd of excess dry weather treatment capacity, which is adequate to accommodate the increase in flow generated by the net new development envisioned under the proposed CPHP. As a result, the proposed CPHP would not result in a determination by the SFPUC that it has inadequate capacity to serve the projected demand, and the impact would be less than significant.

Mitigation: None required.

Irving Street Arrival

The Irving Street Arrival project is intended to better facilitate entry onto the campus site from Irving Street. As this improvement is limited to the reconfiguration of interior space and new exterior treatments, no wastewater generation would occur, and thus no impact to available treatment capacity would occur.

Mitigation: None required.

Research and Academic Building

Net wastewater generation associated with the RAB would be approximately 3,300 gallons per day. As this wastewater generation is a sub-set of total wastewater generation that would occur under the proposed CPHP, wastewater generation associated with the RAB would also not be substantial and the project could be served by existing treatment capacity. No new or expanded wastewater treatment facilities would be required, and this impact would be less than significant.

Mitigation: None required.

Initial Aldea Housing Densification

Net wastewater generation associated with the initial Aldea Housing Densification project would be approximately 9,000 gallons per day. As this wastewater generation is a sub-set of total wastewater generation that would occur under the proposed CPHP, wastewater generation associated with the initial Aldea Housing densification project would also be served by existing treatment capacity. No new or expanded water treatment facilities would be required, and this impact would be less than significant.

Mitigation: None required.

Initial Phase Improvements

The Initial Phase improvements include certain wastewater and stormwater improvements designed to better accommodate wastewater demands of the CPHP development, but the Initial Phase improvements are not in and of themselves a notable source of wastewater generation and need for wastewater treatment. Consequently, the Initial Phase improvements would not result in a significant impact on wastewater treatment capacity, and the impact would be less than significant.

Mitigation: None required.

Impact UTIL-4: Construction of campus development under the proposed CPHP would not generate solid waste in excess of State or local standards or the capacity of local infrastructure and would comply with federal, state and local statutes and regulations related to solid waste. (Less than Significant)

CPHP

Over the duration of the proposed CPHP, construction and demolition activities would generate construction debris at the Parnassus Heights campus site, some of which would require debris disposal. As discussed in the *Environmental Setting*, more than 60 percent of solid waste generated in San Francisco is transported to the Recology Hay Road Landfill in Solano County. The Recology Hay Road Landfill has a permitted peak maximum daily disposal of 2,400 tons per day and has an estimated remaining capacity of approximately 30.4 million cubic yards or 82 percent of its permitted capacity.

The proposed CPHP would construct a total of approximately 2.9 million square feet of new building space and demolish 688,000 square feet of existing building space. Based on the most conservative construction and demolition waste estimates provided by the USEPA, construction and demolition under the proposed CPHP would result in an estimated 61,000 tons of solid waste (USEPA, 2009).[11] Construction and demolition debris would be transported by a registered transporter to a registered facility that must recover for reuse or recycling and divert from landfill

[11] The most conservative generation rates of 4.39 pounds per square foot for construction, and 158 pounds per square foot for demolition were used for this calculation. CPHP construction/demolition generated waste was calculated based on: [(2.9 million square feet of total new CPHP construction * 4.39 pounds/square foot + 688,000 square feet of CPHP demolition * 158 pounds/square foot)/ 2,000 pounds/ton] = 61,000 tons.

at least 65 percent of all received construction and demolition debris. As a result, construction associated with the CPHP would generate an estimated 21,500 tons of waste that would require disposal at a landfill.

Given the existing and potential future landfill capacities of the landfills where UCSF solid waste is disposed, construction that would occur under the proposed CPHP would not result in solid waste generation that exceeds the permitted capacity of the landfills that serve the campus or in non-compliance with federal, State, and local statutes and regulations related to solid waste. Therefore, this impact would be less than significant.

Mitigation: None required.

Irving Street Arrival

Construction of the Irving Street Arrival would involve 25,000 square feet of new construction and 30,000 square feet of building demolition. Construction and demolition associated with the Irving Street Arrival would result in an estimated 2,400 tons of solid waste (USEPA, 2009).[12] When considering at least 65 percent of all received construction and demolition debris would be diverted, construction associated with the Irving Street Arrival would generate an estimated 850 tons of waste.

As discussed above, landfills serving the City of San Francisco have sufficient capacity to serve solid waste generated during the construction of development envisioned under the proposed CPHP. As the solid waste generation associated with the construction of the Irving Street Arrival is a sub-set of total solid waste generation that would occur during construction of the proposed CPHP, solid waste generation associated with the construction of the Irving Street Arrival would also be served by existing disposal capacity. Therefore, construction of the Irving Street Arrival would not result in solid waste generation that exceeds the permitted capacity of the landfills that serve the campus or in non-compliance with federal, state, and local statutes and regulations related to solid waste. As a result, this impact would be less than significant.

Mitigation: None required.

Research and Academic Building

Construction of the RAB would involve approximately 270,000 square of new construction and about 233,100 square feet of building demolition (associated with demolition of UC Hall and the School of Nursing buildings). Construction and demolition under the proposed CPHP would conservatively result in an estimated 19,000 tons of solid waste (USEPA, 2009).[13] When considering at least 65 percent of all received construction and demolition debris would be diverted, construction associated with the RAB would generate an estimated 6,700 tons of waste.

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12 Irving Street Arrival construction/demolition generated waste was calculated based on: [(25,000 square feet of new construction * 4.39 pounds/square foot + 30,000 square feet of demolition * 158 pounds/square foot)/ 2,000 pounds/ton] = 850 tons.

13 RAB construction/demolition generated waste was calculated based on: [(270,000 square feet of new construction * 4.39 pounds/square foot + 233,100 square feet of demolition * 158 pounds/square foot)/ 2,000 pounds/ton] = 19,000 tons.

As discussed above, landfills serving the City of San Francisco have sufficient capacity to serve solid waste generated during the construction of development envisioned under the proposed CPHP. As the solid waste generation associated with the construction of the RAB is a sub-set of total solid waste generation that would occur during construction of the proposed CPHP, solid waste generation associated with the construction of the RAB would also be served by existing disposal capacity. Therefore, construction of the RAB would not result in solid waste generation that exceeds the permitted capacity of the landfills that serve the campus or in non-compliance with federal, state, and local statutes and regulations related to solid waste. As a result, this impact would be less than significant.

Mitigation: None required.

Initial Aldea Housing Densification

Construction of the initial phase of the Aldea Housing Densification project would involve approximately 176,900 square of new construction and about 23,850 square feet of building demolition. Construction and demolition under the proposed CPHP would conservatively result in an estimated 2,300 tons of solid waste (USEPA, 2009).[14] As discussed above, demolition debris would be transported by a registered transporter to a registered facility that must recover for reuse or recycling and divert from landfill at least 65 percent of all received construction and demolition debris. As a result, construction associated with the initial phase of the Aldea Housing Densification project would generate an estimated 800 tons of waste.

As discussed above, landfills serving the City of San Francisco have sufficient capacity to serve solid waste generated during the construction of development envisioned under the proposed CPHP. As the solid waste generation associated with the construction of the initial phase of the Aldea Housing Densification project is a sub-set of total solid waste generation that would occur during construction of the proposed CPHP, solid waste generation associated with the construction of the initial phase of the Aldea Housing Densification project would also be served by existing disposal capacity. Therefore, construction of the initial phase of the Aldea Housing Densification project would not result in solid waste generation that exceeds the permitted capacity of the landfills that serve the campus or in non-compliance with federal, state, and local statutes and regulations related to solid waste. As a result, this impact would be less than significant.

Mitigation: None required.

Initial Phase Improvements

The Initial Phase improvements would not be expected generate a substantial source of construction waste. Nevertheless, as discussed above, demolition debris associated with construction of these improvements would be transported by a registered transporter to a registered facility that must recover for reuse or recycling and divert from landfill at least 65 percent of all received construction and demolition debris. The Initial Phase improvements would not result in solid waste generation that would exceeds the permitted capacity of the

[14] Initial Aldea Housing Densification construction/demolition generated waste was calculated based on: [(176,900 square feet of new construction * 4.39 pounds/square foot + 23,850 square feet of demolition * 158 pounds/square foot)/ 2,000 pounds/ton] = 2,300 tons.

landfills that serve the campus or in non-compliance with federal, state, and local statutes and regulations related to solid waste. As a result, this impact would be less than significant.

Mitigation: None required.

Impact UTIL-5: Operation of campus development under the proposed CPHP would not generate solid waste in excess of State or local standards or the capacity of local infrastructure and would comply with federal, State and local statutes and regulations related to solid waste. (Less than Significant)

CPHP

The operation of campus facilities developed under the proposed CPHP would increase the amount of solid waste generated on the Parnassus Heights campus site. As discussed in the *Environmental Setting*, more than 60 percent of solid waste generated in San Francisco, is transported to the Recology Hay Road Landfill in Solano County. The Recology Hay Road Landfill has a permitted peak maximum daily disposal of 2,400 tons per day and has an estimated remaining capacity of approximately 30.4 million cubic yards or 82 percent of its permitted capacity.

It is estimated that net new development envisioned under the proposed CPHP would generate approximately 2,100 tons[15] of solid waste per year. UCSF employees, students, visitors and patients would continue to participate in UCSF's recycling and composting programs and other efforts to reduce the total amount of waste produced and/or requiring landfill disposal. UCSF has consistently increased its landfill diversion rate, rising from 64 percent in 2013 to 78 percent in 2018, as it strives to meet the UC Policy on Sustainable Practices goal of zero waste by 2020. As a result, if the latest diversion rate of 78 percent is applied, net new development envisioned under the proposed CPHP would generate approximately 460 tons of solid waste per year that would require disposal in a landfill.

Given the existing and anticipated increase in solid waste recycling and the existing and potential future landfill capacities of the landfills where UCSF solid waste is disposed, implementation of the proposed CPHP would not result in solid waste generation that exceeds the permitted capacity of the landfills that serve the campus or in non-compliance with federal, State, and local statutes and regulations related to solid waste. Therefore, this impact would be less than significant.

Mitigation: None required.

Irving Street Arrival

The Irving Street Arrival project is intended to better facilitate entry onto the campus from Irving Street. As this improvement is limited to the reconfiguration of interior space and new exterior

[15] Proposed net new on-campus housing: ([762 net new units * 4 pounds per day] * 365 days per year/2,000 pounds per ton = 556 tons/year) + Net new non-residential building space ([1.4 million square feet * 6 pounds per 1,000 square feet per day) * 365 days per year/2,000 pounds per ton = 1,600 tons) = 2,100 tons.

treatments, there would be no solid waste generation associated with operation of this project, and thus, no impact related to solid waste generation would occur.

Mitigation: None required.

Research and Academic Building

It is estimated that the RAB would generate approximately 296 tons[16] of solid waste per year. The RAB would participate in UCSF's recycling and composting programs and other efforts to reduce the amount of solid waste requiring landfill disposal. As discussed above, most of the solid waste generated on the Parnassus Heights campus site is currently diverted from the solid waste stream, and similarly, a majority of the solid waste generated by the RAB would also be diverted from the solid waste stream. If the current diversion rate of 78 percent is applied, the RAB would generate approximately 65 tons of solid waste per year that would require disposal in a landfill.

As discussed above, landfills serving the City of San Francisco have sufficient capacity to serve solid waste generated by the net new development envisioned under the proposed CPHP. As the solid waste generation associated with the RAB is a sub-set of total wastewater generation that would occur under the proposed CPHP, solid waste generation associated with the RAB would also be served by existing disposal capacity. Therefore, operation of the RAB would not result in solid waste generation that exceeds the permitted capacity of the landfills that serve the campus or in non-compliance with federal, state, and local statutes and regulations related to solid waste. Therefore, this impact would be less than significant.

Mitigation: None required.

Initial Aldea Housing Densification

It is estimated that the occupancy and operation of the initial phase of the Aldea Housing Densification project would generate approximately 104 tons[17] of solid waste per year. The initial phase of the Aldea Housing Densification project would participate in UCSF's recycling and composting programs and other efforts to reduce the amount of solid waste requiring landfill disposal. As discussed above, most of the solid waste generated on the Parnassus Heights campus site is currently diverted from the solid waste stream, and similarly, the same amount of the solid waste generated by the initial Aldea Housing Densification project would also be diverted from the solid waste stream. If the current diversion rate of 78 percent is applied, the net new units provided under the initial phase of the Aldea Housing Densification project would generate approximately 23 tons of solid waste per year that would require disposal in a landfill.

As discussed above, landfills serving the City of San Francisco have sufficient capacity to serve solid waste generated by the net new development envisioned under the proposed CPHP. As the solid waste generation associated with the initial Aldea Housing Densification project is a sub-set of total waste generation that would occur under the proposed CPHP, solid waste generation associated with the initial Aldea Housing Densification project would also be met by existing

16 (270,000 square feet * 6 pounds per 1,000 square feet per day) * 365 days per year/2,000 pounds per ton = 296 tons.
17 (142 net new units * 4 pounds per day) * 365 days per year/2,000 pounds per ton = 104 tons.

disposal capacity. Therefore, operation of the initial Aldea Housing Densification project would not result in solid waste generation that exceeds the permitted capacity of the landfills that serve the campus or in non-compliance with federal, state, and local statutes and regulations related to solid waste. Therefore, this impact would be less than significant.

Mitigation: None required.

Initial Phase Improvements

Operation of the Initial Phase improvements would not generate a substantial source of solid waste requiring disposal. In any case, landfills serving the City of San Francisco have sufficient capacity to serve solid waste generated by the net new development envisioned under the proposed CPHP including from any incidental solid waste associated with the Initial Phase improvements. As such, these improvements would not result in solid waste generation that exceeds the permitted capacity of the landfills that serve the campus or in non-compliance with federal, state, and local statutes and regulations related to solid waste. Therefore, this impact would be less than significant.

Mitigation: None required.

Cumulative Impacts

Impact-C-UTIL-1: Development under the proposed CPHP, in combination with past, present, and reasonably foreseeable future projects in the vicinity of the Parnassus Heights campus site, would not substantially contribute to cumulative impacts related to utilities and services systems. (Less than Significant)

Utility Infrastructure

Net new development under the proposed CPHP, when combined with foreseeable growth in the vicinity of the Parnassus Heights campus site, could increase the demand for utilities and service systems. As the vicinity of the campus site is a densely developed urban area, development in the vicinity of the Parnassus Heights campus site would occur as replacement or in-fill on otherwise built-out sites. City utility systems that serve the area have sufficient capacities to serve those sites and net new development under the proposed CPHP. To the extent that cumulative demands on water, wastewater or stormwater conveyance systems from reasonably foreseeable growth in the City would require the construction of new or expansion of existing conveyance systems, such construction may have the potential to cause environmental impacts. However, in general, impacts would be limited to temporary construction effects and would be minimized by best practices that are routinely imposed by the City on infrastructure projects. As discussed above, with mitigation and compliance with construction-related regulatory requirements, construction-related effects associated with utility improvements needed to serve campus development under the proposed CPHP, including the Irving Street Arrival, RAB and initial Aldea Housing Densification and Initial Phase improvements projects, would be reduced to less than significant. As a result, cumulative impacts with regard to utility infrastructure would be less than significant.

Water Supply

The analysis conducted in Impact UTIL-2, and the WSE it is based on, is a cumulative analysis of the CPHP's water demand within the overall context of the overall cumulative water demand through 2040 based on current water supply planning. The CPHP would not make a considerable contribution to cumulative impacts on water supply, and the impact would be less than significant.

Wastewater Treatment

Net new development under the proposed CPHP, when combined with foreseeable growth in the vicinity of the Parnassus Heights campus site, would also increase the demand for the wastewater treatment facilities. Reasonably foreseeable cumulative projects would need to meet the wastewater pre-treatment requirements of the SFPUC and SWRCB. The area served by the OSP on the westside of the City is largely built out. Any development in the service area would likely consist of replacement or in-fill on otherwise built-out sites. As stated above, the OSP is currently treating 17 mgd and has a dry weather capacity of 43 mgd. As large scale development is not expected to occur with the service area of the OSP due to its built-out nature and the OSP is operating at 40 percent capacity, there is enough capacity to serve development envisioned under the proposed CPHP and reasonably foreseeable future redevelopment and infill development in the service area. Therefore, cumulative impacts with regard to wastewater treatment capacity would be less than significant.

Solid Waste

The proposed project, when combined with foreseeable growth in the vicinity of the Parnassus Heights campus site, would increase demand for solid waste disposal facilities. Increased waste generation from reasonability foreseeable cumulative projects would be partially offset by existing San Francisco ordinances and policies regarding waste reduction. As discussed above, UCSF presently diverts 78 present of its solid waste and has a goal of reaching zero solid waste disposal by 2020. As stated above, the landfills serving the City of San Francisco have sufficient capacity to receive the additional waste. In particular, the Recology Hay Road Landfill has an estimated remaining capacity of approximately 30.4 million cubic yards or 82 percent of its permitted capacity left. Therefore, cumulative impacts with regard to solid waste would be less than significant.

Mitigation: None required.

4.16.4 References

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CHAPTER 5
CEQA Statutory Sections

5.1 Introduction

Section 15126 of the CEQA Guidelines requires that when evaluating a project's impact on the environment all phases of the project must be considered, including planning, construction, and operation, taking account of both the short-term and long-term. More specifically, section 15126.2 requires disclosure of (1) Significant Environmental Effects Which Cannot be Avoided if the Proposed Project is Implemented (CEQA Guidelines section 15126.2(b)), (2) Significant Irreversible Environmental Changes Which Would be Caused by the Proposed Project Should it be Implemented (CEQA Guidelines Section 15126.2(c)), and (3) Growth-Inducing Impact of the Proposed Project (CEQA Guidelines section 15126.2(d)).

Chapter 2, Summary, and Chapter 4, Sections 4.1 through 4.16 provide a comprehensive presentation of the environmental effects of implementation of the proposed CPHP, proposed mitigation measures, and conclusions regarding the level of significance of each impact before and after mitigation. Chapter 6, Alternatives, presents a comparative analysis of alternatives to the proposed CPHP. Other CEQA-required analyses described above are presented below.

5.2 Significant and Unavoidable Impacts

Section 15126.2(b) of the CEQA Guidelines requires that an EIR describe any significant impacts that cannot be avoided, even with the implementation of feasible mitigation measures. The environmental effects of the proposed CPHP on various aspects of the environment are discussed in detail in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures. Significant impacts of the CPHP that cannot be avoided if the CPHP is approved as proposed are summarized in **Table 5-1**, below. Significant and unavoidable impacts of the Irving Street Arrival, RAB and/or initial Aldea Housing Densification projects are summarized in **Table 5-2**, below.

Section 15126.2(b) also requires: "Where there are impacts that cannot be alleviated without imposing an alternative design, their implications and reasons why the project is being proposed, notwithstanding their effect, should be described." The discussion of the feasibility of alternatives to address significant impacts of the proposed CPHP is found in Chapter 6, Alternatives.

TABLE 5-1
SIGNIFICANT AND UNAVOIDABLE IMPACTS OF THE PROPOSED CPHP

Impacts
4.1 Aesthetics, Wind and Shadow
Impact AES-4: Implementation of the CPHP would potentially create wind hazards in publicly accessible areas of substantial pedestrian use.
Impact C-AES-3: Implementation of the CPHP, combined with cumulative projects, would potentially create wind hazards in publicly accessible areas of substantial pedestrian use.
4.2 Air Quality
Impact AIR-2: Operation of campus facilities developed under the CPHP would result in a cumulatively considerable net increase of a criteria pollutant (PM_{10}) for which the project region is non-attainment under an applicable federal or state ambient air quality standard.
Impact C-AIR-1: Implementation of the CPHP would result in a cumulatively considerable net increase of a criteria pollutant (PM_{10}) for which the project region is non-attainment under an applicable federal or state ambient air quality standard.
4.4 Cultural Resources and Tribal Cultural Resources
Impact CUL-1: Implementation of the CPHP would result in a substantial adverse change in the significance of known historical resources.
Impact CUL-2: Implementation of the CPHP would result in a substantial adverse change in the significance of potential future historical resources that may become eligible by the full build-out of the CPHP in 2050.
Impact C-CUL-1: Implementation of the CPHP would result in cumulatively considerable impacts on cultural and/or tribal cultural resources, in combination with past, present and reasonably foreseeable future projects in the vicinity of the Parnassus Heights campus site.
4.11 Noise and Vibration
Impact NOI-1: Construction activities under the CPHP would generate a substantial temporary increase in ambient noise levels in the vicinity of the construction project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
Impact C-NOI-1: Implementation of the CPHP, combined with cumulative construction noise in the project area, would generate a substantial temporary increase in ambient noise levels from construction activity in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

TABLE 5-2
SIGNIFICANT AND UNAVOIDABLE IMPACTS OF THE PROPOSED IRVING STREET ARRIVAL, RAB, AND INITIAL ALDEA DENSIFICATION PROJECTS

Impacts
4.1 Aesthetics, Wind and Shadow
Impact AES-4: Implementation of the Irving Street Arrival, RAB, and initial Aldea Housing Densification projects would potentially create wind hazards in publicly accessible areas of substantial pedestrian use.
4.4 Cultural Resources and Tribal Cultural Resources
Impact CUL-1: Implementation of the RAB, Initial Aldea Densification project, and Initial Phase improvements would result in a substantial adverse change in the significance of known historical resources.
4.11 Noise and Vibration
Impact NOI-1: Construction activities under the RAB and initial Aldea Housing Densification projects would generate a substantial temporary increase in ambient noise levels in the vicinity of the construction project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

5.3 Significant Irreversible Environmental Effects

Under CEQA, an EIR must analyze the extent to which a project's primary and secondary effects would commit future generations to the allocation of nonrenewable resources and to irreversible environmental damage (CEQA Guidelines Section 15126.2(c)). Specifically, Section 15126.2(c) states:

> Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible, since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

Generally, a project would result in significant irreversible environmental changes if:

- The primary and secondary impacts would generally commit future generations to similar uses;
- The project would involve a large commitment of nonrenewable resources;
- The proposed consumption of resources is not justified (e.g., the project involves the wasteful use of energy); and/or
- The project would involve uses in which irreversible damage could result from any potential environmental accidents associated with the project.

With respect to the potential of the proposed CPHP to commit future generations to similar uses, the Parnassus Heights campus site is largely built out and the proposed CPHP would not alter the types of land uses and activities conducted at the campus site. As discussed in Chapter 3, Project Description, the great majority of new development would be contained within the largely developed areas within the Parnassus Heights campus site. There is also the potential for certain new development under the CPHP, including the proposed New Hospital and associated widening of Medical Center Way adjacent to the New Hospital, to result in the need to modify the Reserve boundary. UCSF would replace any Reserve area that is lost due to new development under the CPHP by designating new Reserve area elsewhere on the campus site in an amount equal to or greater than that area lost. As determined in Section 4.10, Land Use and Planning, the functional zones proposed under the CPHP are generally consistent with the existing functional zones established for the Parnassus Heights campus site under the 2014 LRDP. The functional zone changes proposed under the CPHP do not involve a functional zone change that would place a new use adjacent to existing developed land uses outside of the campus site boundaries to create a land use conflict.

With respect to the commitment of non-renewable resources, and consumption of resources, these would occur during both construction and operation of the proposed CPHP. Construction of new development under the proposed CPHP would require the use of fossil fuel, construction materials and water. During operation, the proposed CPHP would also require an irreversible commitment of energy, primarily in the form of fossil fuels for heating and cooling of buildings,

for vehicle fuel, and for energy production; as well as potable and non-potable water for consumption, landscaping, and other uses.

However, as discussed in Section 4.5, Energy, the University would be required to adhere all relevant *UC Sustainable Practices Policy* provisions that are designed to conserve and reduce energy consumption. These provisions require 20 percent or better energy performance than California Code of Regulations Title 24 for new construction and renovations, and strives to achieve 30 percent; requires new laboratory buildings to meet Labs21 Environmental Performance Criteria; and requires all new construction and major renovations to meet a minimum standard of LEED-NC Silver and strive for LEED-NC Gold when possible. In addition, the projects and activities under the proposed CPHP would address UCSF's achievement of goals set forth in the adopted Carbon Neutrality Initiative (CNI), which has goals more stringent than the statewide target of achieving 80 percent below 1990 emission levels by 2050. Campus programs that are implemented to achieve the goals would have the effect of reducing overall energy usage.

As described further in Section 4.15, Transportation, future average daily VMT per capita for residential and office uses under the proposed CPHP would be substantially lower than the San Francisco Bay Area average. The VMT rates would be supported by the University's Transportation Demand Management program. In addition, the provision of additional on-campus housing for faculty and students under the CPHP would lower commuting VMT over the CPHP planning period. Lower VMT results in lower mobile fuel use per worker and per resident than the regionwide and countywide average.

In addition, as described in Section 4.7, Greenhouse Gas (GHG) Emissions, while total GHG emissions under the proposed CPHP in 2050 would increase by nearly 50 percent over existing conditions, GHG emissions per service population would incrementally decrease under the proposed CPHP by 2050. Furthermore, with GHG reduction measures recommended to be included in the GHGRS update, along with mitigation identified in the Draft EIR (implementation of water conservation strategies and air quality operational measures; and Monitor emissions annually and acquire carbon offset credits in conformance with CARB guidance to achieve and maintain carbon neutrality for the Parnassus Heights campus site under the CPHP), GHG emissions impacts would be less than significant.

With respect to uses in which irreversible damage could result from any potential environmental accidents associated with the proposed CPHP, these potential effects are discussed in detail in Section 4.8, Hazards and Hazardous Materials. Clinics, laboratories and research facilities proposed under the CPHP would involve the transport, handling, storage and disposal of varied and large quantities of hazardous materials, including low-level radioactive waste and medical/biological waste. If not handled appropriately, upset and accident conditions could result in releases of hazardous materials or wastes that could result in adverse effects to residents, workers, the public or the environment. However, with the University's adherence to existing regulatory requirements and management programs, the potential impact to workers, residents, visitors, or the environment would be reduced to a less-than-significant level.

5.4 Growth-Inducing Effects

As required under CEQA, an EIR must include a discussion of the ways in which the proposed CPHP could directly or indirectly foster economic or population growth, or the construction of additional housing and how that growth would, in turn, affect the surrounding environment (CEQA Guidelines Section 15126.2(d)). Growth can be induced in a number of ways, including the elimination of obstacles to growth, or through the stimulation of economic activity within the region. The discussion of removal of obstacles to growth relates directly to the removal of infrastructure limitations or regulatory constraints that could result in population growth or development unforeseen at the time of project approval. Under CEQA, growth is not necessarily considered beneficial, detrimental, or of little significance to the environment.

5.4.1 Direct Population and Employment Growth

As discussed in Section 4.12, Population and Housing, the proposed CPHP would directly result in development and associated population and employment growth. UCSF anticipates that the campus population, which includes faculty, staff, and students, would grow by approximately 4,100 persons by 2030 and an additional 1,080 persons by 2050. This growth includes approximately 500 students and about 3,600 faculty and staff by 2030 and approximately additional 1,080 faculty and staff by 2050.

In order to accommodate the increase in students, faculty, and staff under the proposed CPHP, UCSF plans on constructing 142 net new housing units/beds within the Aldea housing complex by 2030, and an additional 620 net new residential units within the Aldea housing complex and western portion of the campus core by 2050, for a total of 762 net new units.

Campus population growth under the proposed CPHP would not be entirely accommodated by the existing and new housing on the Parnassus Heights campus site, and therefore would result in an indirect housing demand (and associated population growth) beyond the campus site.

The City and County of San Francisco is the primary study area that would be affected directly by CPHP-related population and housing effects as well as by employment effects that could in turn result in demand for additional housing. However, effects may extend beyond San Francisco to neighboring counties in the Bay Area. As discussed in Section 4.12, Population and Housing, it is estimated that approximately 60 percent of UCSF students and employees commute from places within San Francisco, and therefore likely reside in San Francisco. Besides San Francisco, employee commuters largely travel from four other counties to UCSF campus sites: Alameda, Contra Costa, Marin, and San Mateo. It is assumed that future students and employees would make approximately the same residential location decisions as current UCSF students and employees. In addition, there would also be additional population living in those UCSF employee and student households. As estimated in Section 4.12, the total population in San Francisco associated with UCSF growth under the proposed CPHP would be approximately 5,800 persons by 2030 and an additional 1,530 persons by 2050. The total population in the remaining four counties associated with UCSF growth under the proposed CPHP would be approximately 4,410 persons by 2030 and an additional 1,160 persons by 2050.

The potential physical environmental impacts associated with the direct population growth and associated housing on the Parnassus Heights campus site under the proposed CPHP are evaluated in the environmental analysis sections of this EIR (e.g., Section 4.2, Air Quality; Section 4.5, Energy; Section 4.13, Public Services; Section 4.15, Transportation; and 4.16 Utilities and Service Systems). New off-site housing that would be constructed for the students, faculty, and staff living off-site would likely result in some environmental impacts; however, it would be speculative to characterize the site-specific environmental effects resulting from the development of such off-site housing.[1] The General Plans of jurisdictions where new off-site housing would be developed contain policies and other measures that address the environmental effects of new housing development. Specific housing development projects also would be subject to the environmental review process of affected jurisdictions.

In general, the potential effects of this population growth could include: increased traffic congestion; increased air pollutant emissions; loss of agricultural land and open space; loss of habitat and associated flora and fauna; increased demand on public utilities and services, such as fire and police protection, water, recycled water, wastewater, solid waste, energy, and natural gas; and increased demand for housing. An increase in population growth would also require governmental services including, but not limited to, public schools, libraries, and parks.

5.4.2 Indirect Economic Growth

In addition to the employment growth generated by the proposed CPHP, additional local employment could be generated through what is commonly referred to as the "multiplier effect." The multiplier effect refers to the secondary economic effects caused by spending from project-generated residents and employees.

The multiplier effect also calculates induced employment. Induced employment follows the economic effect of employment beyond the expenditures of the employees within the Parnassus Heights campus site to include jobs created by the stream of goods and services necessary to construct the proposed CPHP. For example, when a manufacturer buys products or sells products, the employment associated with those inputs or outputs are considered induced employment. As an additional example, when a staff member from the campus site goes out to lunch, the person who serves the student or employee lunch holds a job that was indirectly caused by the proposed CPHP. When the server then goes out and spends money in the economy, the jobs generated by this third-tier effect are considered induced.

The multiplier effect tends to be greater in regions with larger diverse economies (such as the Bay Area) due to a decrease in the requirement to import goods and services from outside the region, as compared to the effects of spending in smaller economies where goods and services must be imported from elsewhere.

Indirect economic growth would result under the proposed CPHP from non-UCSF jobs that might be induced by the growth in campus-affiliated populations. Indirect jobs that would be generated by

[1] CEQA Guidelines section 15145 states that "[i]f, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact."

the proposed CPHP include those of suppliers of goods and services to UCSF and induced jobs are created through the household expenditures of UCSF and supplier workers. For example, when a UCSF s staff member purchases goods or services at local businesses, additional employees are hired.

The number of indirect and induced jobs generated by a university is commonly calculated by applying a ratio, or job multiplier, to the number of jobs provided directly by such an institution. The projected increase in jobs under the proposed CPHP is approximately 3,600 staff and faculty positions by 2030 and an additional 1,080 staff and faculty positions by 2050, for a total of 4,680 new jobs. Using a job multiplier of 0.73[2], at full development of the campus site under the CPHP (by 2050), an additional 3,420 jobs elsewhere in the Bay Area could be indirectly caused by or induced by growth under the proposed CPHP.

5.4.3 Environmental Effects of Indirectly Caused and Induced Growth

The residence locations of people working in indirect and induced jobs is unknown. It would be speculative to conclude where such workers would reside or be employed in the Bay Area (or beyond), or to determine any associated environmental effects.

Growth induced directly and indirectly by the proposed CPHP would likely affect the greater Bay Area region. While it is acknowledged above that the precise nature, location, and magnitude of effects of indirect and induced growth cannot be determined, the proposed CPHP would likely increase overall demand in the region for housing, commercial and industrial space, and associated infrastructure. Potential effects could include: increased traffic congestion; increased air pollutant emissions; loss of agricultural land and open space; loss of habitat and associated flora and fauna; increased demand on public utilities and services, such as fire and police protection, water, recycled water, wastewater, solid waste, energy, and natural gas; and increased demand for housing. An increase in housing demand in the Bay Area region would also require governmental services including, but not limited to, schools, libraries, and parks to serve new commercial and residential development.

Indirect and induced employment and population growth could further contribute to the loss of open space because it would encourage conversion to urban uses for housing, commercial space, and infrastructure, although most jurisdictions have adopted smart-growth policies that discourage or prohibit this type of development.

[2] Multipliers identified in studies of other college campuses range from 0.33 to 1.36 (Stanford, 2017). At 0.73 indirect and induced workers per University of San Francisco worker, the study conducted for USF may provide the best "order of magnitude" estimate for regional impacts for UCSF, as it is in the same Bay Area region with the same range of available local goods and services.

5.4.4 Removal of Obstacles to Growth

The elimination of physical obstacles to growth is considered a growth-inducing effect. The proposed CPHP would result in additional development on the Parnassus Heights campus site. The proposed CPHP would include infrastructure improvements designed to accommodate growth on the Parnassus Heights campus site through 2050. Proposed improvements include underground pipelines, electrical transmission lines, water supply infrastructure, roadway extensions and modifications, pathways, and other similar types of improvements. The scale and nature of these improvements would be to accommodate the growth and development on the Parnassus Heights campus site directly attributable to the proposed CPHP. The infrastructure improvements undertaken as part of the proposed CPHP would be designed to serve the planned development on the campus site and would not be designed to support growth outside the Parnassus Heights campus site, and thus would not remove an obstacle to growth in the City and County of San Francisco.

5.5 References

Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG), 2018. Plan Bay Area: Projections 2040. November 2018.

Stanford University, 2017. *2018 General Use Permit Application*, Technical Data to Address Population and Associated Housing Demand, July 25, 2017.

CHAPTER 6
Alternatives

6.1 Introduction

An EIR must describe a range of reasonable alternatives to the proposed project that might feasibly accomplish most of the basic objectives of the proposed project and could avoid or substantially lessen one or more of the significant effects. This chapter describes the CEQA requirements for an alternatives analysis, presents UCSF's project objectives, summarizes the significant effects of the proposed CPHP that cannot be avoided or reduced to less than significant, and describes the alternatives, including those that were considered but dismissed from further evaluation. The chapter then considers the comparative effects of each of the alternatives relative to those of the proposed CPHP, and evaluates the relationship of the alternatives to the project objectives. As required under Section 15126.6(e) of the State CEQA Guidelines, an environmentally superior alternative is identified and addressed at the end of this chapter.

6.1.1 CEQA Requirements for Alternatives Analysis

CEQA requires that an EIR describe and evaluate a range of reasonable alternatives to the proposed project, or to the location of the proposed project, and evaluate the comparative merits of the alternatives (CEQA Guidelines Section 15126.6(a), (d)). The "range of alternatives" is governed by the "rule of reason," which requires the EIR to describe and consider only those alternatives necessary to permit informed public participation, and an informed and reasoned choice by the decision-making body (CEQA Guidelines Section 15126.6(a), (f)).

The range of alternatives must include alternatives that could feasibly attain most of the basic objectives of the project and could avoid or substantially lessen any of the significant effects of the project (CEQA Guidelines Section 15126.6(a)-(c)). CEQA generally defines "feasible" to mean an alternative that is capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, technological, and legal factors. In addition, the following may be taken into consideration when assessing the feasibility of alternatives: site suitability; economic viability; availability of infrastructure; general plan consistency; other plans or regulatory limitations; jurisdictional boundaries; and the ability of the proponent to attain site control (CEQA Guidelines Section 15126.6(f)(1)). If the lead agency concludes that no feasible alternative locations exist, it must disclose the reasons for this conclusion, and should include the reasons in the EIR (CEQA Guidelines Section 15126.6(f)(2)(B)).

The description or evaluation of alternatives does not need to be exhaustive, and an EIR need not consider alternatives for which the effects cannot be reasonably determined and for which

implementation is remote or speculative. An EIR need not describe or evaluate the environmental effects of alternatives in the same level of detail as the proposed project, but must include enough information to allow meaningful evaluation, analysis, and comparison with the proposed project (CEQA Guidelines Section 15126.6(d)).

The "no project" alternative must be evaluated. This analysis is required to include a discussion of the continuation of the existing conditions, as well as what could be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services (CEQA Guidelines Section 15126.6(e)(2)). When the project is the revision of an existing land use plan, the no project alternative will be the continuation of the existing plan into the future.

CEQA also requires that an environmentally superior alternative be selected from among the alternatives. The environmentally superior alternative is the alternative with the fewest or least severe adverse environmental impacts. If the "no project" alternative is the environmentally superior alternative, the EIR must also identify an environmentally superior alternative from among the other alternatives (CEQA Guidelines Section 15126.6(e)(2)).

6.2 Alternatives Selection

As noted above, the selection of alternatives for consideration in an EIR depends on whether the possible alternative can feasibly meet most of the basic objectives of the project and avoid or substantially lessen any significant impacts of the project. The project objectives presented in Chapter 3, *Project Description,* and the significant unavoidable impacts of the CPHP identified in Chapter 4, *Environmental Setting, Impact, and Mitigation Measures* are listed below.

6.2.1 Project Objectives

Parnassus Heights [from the 2014 LRDP and FEIR]

The 2014 LRDP FEIR identified objectives specific to the Parnassus Heights campus site. Those objectives which are listed below remain valid, with the exception of objective E. related to the space ceiling, to be revised as shown as part of the proposed amendment to the LRDP.

A. Continue to promote excellence and leadership in health science education, maintaining the Parnassus Heights campus site as the central location for classroom instruction.

B. Ensure that adequate space is provided to foster collaboration and to facilitate the inter-dependence and connectivity for operational efficiency and effectiveness of instruction, clinical, research and support uses in close physical proximity to each other.

C. Ensure that Long Hospital and the New Hospital Addition have adequate clinical and administrative support and are aligned with education, research and specialized care programs and support that remain at the campus site.

D. Provide additional campus housing and improve campus life amenities including outdoor space.

E. ~~Strive to better achieve the remaining unfulfilled components of the 1976 Regents' Resolution by reducing space, minimizing population growth, and improving transportation-related programs.~~ Conform to the space limits and population estimates established in the Regents' Resolution Regarding the Parnassus Heights Campus Site, as amended.

F Preserve the Mount Sutro Open Space Reserve as permanent open space, and serve as the steward of the Reserve by maintaining and expanding the trail system and by ensuring the safety of visitors and neighboring structures.

Objectives for the CPHP

The following are objectives pertaining to the CPHP, including its Initial Phase projects.

Space

- Revitalize the aging Parnassus Heights campus to enhance its place as a premier educational, research, and clinical institution -- one that draws in research and clinical faculty, staff, students, and trainees.
- Fulfill the need for contemporary research, educational, clinical, and support spaces that have been lacking at Parnassus Heights for decades.
- Increase the quantity and improve the quality of research space, to enhance synergies between research and clinical activities at Parnassus Heights for UCSF to maintain its stature as a world-class hub of basic, translational, and clinical research.
- Connect buildings and spaces at multiple levels to foster collaboration that facilitates learning and scientific discoveries.
- Facilitate patient/pedestrian safety and functional efficiency by connecting campus buildings across and under Parnassus Avenue.
- Increase the on-campus supply of housing for students, faculty and staff, thereby minimizing the impact of UCSF-demand for housing on adjoining neighborhoods.

Urban Design

- Improve the campus's functional organization and foster intuitive wayfinding.
- Develop a framework of open spaces that enhance the campus environment by connecting people to nature.
- Create welcoming spaces for enhancing the patient/visitor experience throughout the campus site.
- Enhance connectivity between the campus site and the surrounding community.

Mobility

- Promote sustainable transportation behavior.
- Improve campus circulation options to reduce impacts on the surrounding neighborhood.
- Improve the patient and visitor parking and arrival experience.

- Create safe on- and off-street passenger drop-off zones.
- Enhance Parnassus Avenue as a campus "main street."
- Optimize the use of existing parking supply.
- Enhance overall campus functionality and efficiency.
- Improve campus circulation by way of a service corridor that facilitates loading and deliveries to campus and minimizes impacts of those activities on the neighborhood.

Objectives for Irving Street Arrival

- Create a welcoming experience for patients, visitors, students, and employees arriving at the Parnassus Heights campus site.
- Enhance and speed the pedestrian journey between Irving Street and Parnassus Avenue.
- Provide amenities that benefit the UCSF community and draw in residents from the surrounding neighborhood, such as a reception area, wellness offerings, and convenience retail.

Objectives for the Research and Academic Building

- Provide new state-of-the-art, flexible research space on the Parnassus Heights campus site expediently to replace existing obsolete wet lab space and to satisfy existing demand.
- Site and develop a new research and educational building at a location that is currently underutilized or otherwise a candidate for demolition, to minimize the disruption to campus operations that would be caused by relocation of occupants of heavily-occupied buildings.
- Provide an "empty chair" i.e., space in which to move research teams so that vacated deteriorating space can be renovated.
- Provide replacement space for the seismically deficient School of Nursing building.

Objectives for the New Hospital at Parnassus Heights

- Meet seismic requirements of California Senate Bill 1953 by developing a new, seismically-sound, state-of-the-art inpatient facility.
- Site and develop a new inpatient facility in a way that optimizes operational activities with other clinical facilities at Parnassus Heights, such as Long Hospital, a renovated and repurposed Moffitt Hospital building, and Medical Building 1.
- Increase inpatient beds at Parnassus Heights to address severe constraints on capacity and access to care, and to meet the needs of a growing and aging Bay Area population.
- Increase inpatient beds at Parnassus Heights to allow for the capacity to provide inpatient health care in times of severe strain such as the current pandemic, without resorting to reducing or canceling non-essential surgeries to create bed capacity.
- Develop a new inpatient facility that has sufficient space to accommodate modern regulatory requirements and industry standards of contemporary hospitals, such as construction codes, sizes of operating rooms, ratio of operating rooms to pre-and post-recovery areas, and space for privacy and infection control issues.

- Develop a new inpatient facility that has sufficient space to accommodate modern technology, including telemedicine, robotics, and new diagnostic, imaging, testing, treatment, surgery and laboratory equipment, all requiring substantial infrastructure and space.
- Develop a new inpatient facility that has sufficient space to accommodate patient satisfaction requirements of contemporary hospitals, such as private patient rooms of sufficient size.
- Develop a new inpatient facility that is optimized in its spatial layout to enhance functionality and efficiency.
- Develop spaces for clinical and translational research and learning in or adjacent to clinical areas where patients are located.

Objectives for the Aldea Housing Densification

- Increase the supply of housing for UCSF students and potentially faculty and staff.
- Develop housing in a cost-effective manner in order to make rents as affordable as possible for housing residents.
- Develop housing at a location that minimizes cumulative construction impacts with other proposed development along Parnassus Avenue.

6.2.2 Summary of Significant and Unavoidable Environmental Effects of the Proposed CPHP

As described above, alternatives to the proposed CPHP must substantially lessen or avoid one or more of the significant project and/or cumulative environmental impacts. **Table 6-1**, below, summarizes the significant and unavoidable impacts identified in Chapter 4 of this EIR.

TABLE 6-1
SIGNIFICANT AND UNAVOIDABLE IMPACTS OF THE PROPOSED CPHP

Impacts
4.1 Aesthetics, Wind and Shadow
Impact AES4: Implementation of the CPHP would potentially create wind hazards in publicly accessible areas of substantial pedestrian use.
Impact C-AES-3: Implementation of the CPHP, combined with cumulative projects, would potentially create wind hazards in publicly accessible areas of substantial pedestrian use.
4.2 Air Quality
Impact AIR-2: Operation of campus facilities developed under the CPHP would result in a cumulatively considerable net increase of a criteria pollutant (PM_{10}) for which the project region is non-attainment under an applicable federal or state ambient air quality standard.
Impact C-AIR-1: Implementation of the CPHP would result in a cumulatively considerable net increase of a criteria pollutant (PM_{10}) for which the project region is non-attainment under an applicable federal or state ambient air quality standard.
4.4 Cultural Resources and Tribal Cultural Resources
Impact CUL-1: Implementation of the CPHP would result in a substantial adverse change in the significance of known historical resources.

TABLE 6-1 (CONTINUED)
SIGNIFICANT AND UNAVOIDABLE IMPACTS OF THE PROPOSED CPHP

Impacts
4.4 Cultural Resources and Tribal Cultural Resources (cont.)
Impact CUL-2: Implementation of the CPHP would result in a substantial adverse change in the significance of potential future historical resources that may become eligible by the full build-out of the CPHP in 2050.
Impact C-CUL-1: Implementation of the CPHP would result in cumulatively considerable impacts on cultural and/or tribal cultural resources, in combination with past, present and reasonably foreseeable future projects in the vicinity of the Parnassus Heights campus site.
4.11 Noise and Vibration
Impact NOI-1: Construction activities under the CPHP would generate a substantial temporary increase in ambient noise levels in the vicinity of the construction project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
Impact C-NOI-1: Implementation of the CPHP, combined with cumulative construction noise in the project area, would generate a substantial temporary increase in ambient noise levels from construction activity in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

6.3 Alternatives Selected for Further Evaluation

The alternatives identified for detailed evaluation and designed to inform public participation and reasoned choice by decision-makers are:

Alternative 1: No Project Alternative, consisting of:

- 1A: No Project - No Development; and
- 1B: No Project - Development under 2014 LRDP;

Alternative 2: Reduced Project;

Alternative 3: CPHP including New Hospital - 19-Story Option; and

Alternative 4: CPHP including New Hospital - Phased Option.

Table 6-2, below, provides a summary comparison of the principal differences in characteristics between the proposed CPHP and the alternatives, and the sections that follow describe each alternative, how its impacts would differ from those of the CPHP, and how it would or would not address the project objectives.

TABLE 6-2
COMPARISON SUMMARY OF PROPOSED CPHP AND ALTERNATIVES CHARACTERISTICS

	Proposed CPHP	Alternative 1: No Project Alternatives		Alternative 2: Reduced Project	Alternative 3: CPHP including New Hospital - 19-Story Option	Alternative 4: CPHP including New Hospital - Phased Option
		Alternative 1A: No Project - No Development	Alternative 1B: No Project - Development Under 2014 LRDP			
CPHP Development						
Net Increase in Space (gsf) at Parnassus Heights Campus Site over Existing			*By 2035:*			
Instruction, Research, Clinical, Pkg, Alteration	+1.37 mil. gsf	0 mil. gsf	+0.20 mil gsf	+0.98 mil gsf	Same as proposed CPHP	+0.99 mil gsf
Housing	+0.67 mil gsf	0 mil gsf	+0.27 mil gsf	+0.55 ml gsf		+0.67 ml gsf
Total Net Increase	**+2.04 mil gsf**	**+0 mil gsf**	**+0.47 mil. gsf**	**+1.53 mil gsf**		**+1.66 mil gsf**
Net Change in Beds at Parnassus Heights Campus Site over Existing						
Initial Phase	+200 beds	0 beds				+68 beds
Future Phase	0 beds	0 beds	*By 2035:*	Same as proposed CPHP	Same as proposed CPHP	+132 beds
Total Net Change	**+200 beds**	**0 beds**	**-36 beds**			**+200 beds**
Net Increase Housing (Units) over Existing						
Initial Phase	+142 units	+0 units		+190 units		
Future Phase	+620 units	+0 units	*By 2035:*	430 units	Same as proposed CPHP	Same as proposed CPHP
Total Net Increase	**+762 units**	**+0 units**	**+329 units**	**+620 units**		
Revision to Open Space Reserve Boundary?	Yes (potentially for widening of Medical Center Way, and for New Hospital)	No	No	Yes (potentially for widening of Medical Center Way)	Yes (potentially for widening of Medical Center Way)	Yes (potentially for widening of Medical Center Way)
LRDP Revisions						
Ave. Daily Pop. Increase over Existing	+7,855	+0	*By 2035:* +1,109	+5,891	Same as proposed CPHP	Same as proposed CPHP
Space Ceiling Amendment	Yes (increase of 1.5 mil. gsf, excluding housing)	No	No	Yes (increase of 1.1 mil. gsf, excluding housing)	Same as proposed CPHP	Yes (increase of 1.1 mil. gsf, excluding housing)
Update to GHG Reduction Strategy	Yes	Yes	Yes	Yes	Yes	Yes

6.3.1 Alternative 1A: No Project - No Development Alternative

The No Project - No Development Alternative assumes remaining development authorized under the 2014 LRDP at the Parnassus Heights campus site would not occur, and furthermore, new development proposed under the CPHP at the campus site would also not occur. As such, building demolition projects authorized, but not yet implemented under the 2014 LRDP at the Parnassus Heights campus site, including the LPPI, Koret Vision Center, EHS, Surge, Woods, and Proctor buildings; and approved but not-yet-completed improvements under the 2014 LRDP, would not be implemented under this alternative. It is further assumed Moffitt Hospital would be decommissioned and reused for uses other than inpatient care.

In addition, under this alternative, the CPHP development program envisioned at the campus site would not occur, including for clinical, research, instruction, housing, and open space uses; supporting utilities, transportation improvements (e.g., Fourth Avenue extension); implementation of the Parnassus Avenue Streetscape Plan; and community investments. This alternative also assumes no modification of the Reserve boundary that would occur under the proposed CPHP associated with the widening of Medical Center Way, and potentially, from construction of the New Hospital.

Because there would be no change in existing development or population at the Parnassus Heights campus site under this alternative, there would be no revisions to the 2014 LRDP as proposed in conjunction with the CPHP, including no revisions to campus site functional zones, no revisions to the space program, no update to the population, no revisions to the Regents' Resolution related to the space ceiling, and no update to the UCSF Greenhouse Gas Reduction Strategy.

It is assumed that UCSF would continue implementation of the *Mount Sutro Open Space Reserve Vegetation Management Plan*, and on-going campus site maintenance programs and activities.

Comparison of Effects of No Project - No Development Alternative to the Proposed CPHP

Aesthetics, Wind and Shadow

Aesthetics

No new development proposed under the CPHP would occur at the Parnassus Heights campus site under this alternative. As a result, this alternative would avoid the less than significant project or cumulative effects on scenic vistas, and conflicts with applicable zoning and other regulations governing scenic quality associated with the CPHP; and would avoid the significant but mitigable impact related to new sources of light and glare that would occur under CPHP.

Wind

No new development associated with the proposed CPHP would occur at the Parnassus Heights campus site under this alternative. Consequently, this alternative would avoid the potentially

significant and unavoidable project and cumulative wind hazard impacts in publicly accessible areas of substantial pedestrian use that would occur under the CPHP.

Shadows

No new development associated with the proposed CPHP would occur at the Parnassus Heights campus site under this alternative. As a result, this alternative would avoid the impact, albeit less than significant, of creating new shadow, or contributing to cumulative shadowing, in publicly accessible open spaces, that would be associated with the CPHP.

Air Quality

No new construction or demolition activities associated with the proposed CPHP would occur at the Parnassus Heights campus site under this alternative. Consequently, this alternative would avoid the significant but mitigable air quality effects associated with increases in construction–generated criteria pollutants, and with exposure of sensitive receptors to substantial pollutant concentrations, that would occur under the CPHP. Furthermore, since no increase in operational development and associated population and traffic increases associated with CPHP would occur at the Parnassus Heights campus site under this alternative, it would avoid the significant and unavoidable project and cumulative impact related to net increases of operational criteria pollutants that would occur under the CPHP. The significant but mitigable CPHP impact associated with exposure of sensitive receptors to substantial project and cumulative operational pollutant concentrations due to increased campus site operations would also not occur under this alternative. Lastly, the significant but mitigatable impact associated with the CPHP's conflict with or obstruction of implementation of the *2017 Clean Air Plan* would not occur under this alternative.

Biological Resources

No new construction or demolition activities associated with the proposed CPHP would occur at the Parnassus Heights campus site under this alternative. As a result, this alternative would avoid the significant but mitigable project and cumulative construction-related effects on special-status plant and wildlife species associated with the CPHP. In addition, this alternative would avoid the significant but mitigable project and cumulative impacts associated with potential resident and migrating bird strikes during construction and operation identified with the CPHP. Lastly potential effects, albeit less than significant, associated with damage to or removal of landmark trees would also not occur under this alternative.

Cultural Resources

No building alteration or demolition activities associated with the proposed CPHP would occur at the Parnassus Heights campus site under this alternative. Consequently, this alternative would avoid the significant and unavoidable project and cumulative effects on historic resources, including to UC Hall, Millberry Union, School of Dentistry, LPPI, and Aldea San Miguel Housing Buildings 8, 10, and 12; as well as with impacts to potential future historical resources that may become eligible by the full build-out of the CPHP in 2050. In addition, since no ground disturbing construction activities associated with the proposed CPHP would occur at the

Parnassus Heights campus site under this alternative, it would avoid the significant but mitigable project and cumulative impacts to previously unknown archaeological resources, human remains, and tribal cultural resources that would occur under the CPHP.

Energy

No construction or demolition activities associated with the proposed CPHP would occur at the Parnassus Heights campus site under this alternative. As a result, this alternative would avoid the construction energy use impact associated with this CPHP. In addition, no increase in operational development and associated population increases associated with the CPHP would occur at the Parnassus Heights campus site under this alternative. Consequently, this alternative would not result in an increase in operational energy use. As such, the alternative would avoid the less than significant project or cumulative CPHP impact associated with consumption of energy resources, and the conflict with a state or local plan for renewable energy or energy efficiency.

Geology and Soils

No ground disturbing construction activities, or new building construction associated with the proposed CPHP would occur at the Parnassus Heights campus site under this alternative. As a result, this alternative would avoid the significant but mitigable project and cumulative impact associated with the CPHP for new development in vicinity of landslides. In addition, this alternative would avoid the potential project and cumulative less than significant impact associated with the CPHP as it relates to effects of seismic ground shaking, liquefaction or unstable soils, and erosion from ground disturbance during construction.

Greenhouse Gas Emissions

No new construction or demolition activities associated with the proposed CPHP would occur at the Parnassus Heights campus site under this alternative. As a result, this alternative would avoid the impact, albeit less than significant, related to construction-generated greenhouse gas emissions associated with the CPHP. In addition, no increase in operational development and associated population and traffic increases associated with the CPHP would occur at the Parnassus Heights campus site under this alternative. Consequently, this alternative would avoid the less than significant impact of increases in operational greenhouse gas emissions associated with the CPHP. Furthermore, this alternative would not conflict with applicable plans, policies or regulations adopted for the purpose of reducing the emissions of greenhouse gases.

Hazards and Hazardous Materials

No new construction or demolition activities associated with the proposed CPHP would occur at the Parnassus Heights campus site under this alternative. In addition, this alternative would not increase operational development and therefore would not involve the associated increases in hazardous materials use that would occur under the CPHP. Accordingly, this alternative would avoid the significant but mitigable project and cumulative CPHP impacts associated with routine transport, use, or disposal of hazardous materials; and with encountering potential legacy contaminates in soil during construction. In addition, this alternative would avoid the project and cumulative impacts, albeit less than significant, associated with potential accidental release of

hazardous materials; and emitting and handling of hazardous materials within one-quarter mile of an existing or proposed school.

Hydrology and Water Quality

No new construction or ground disturbing activities associated with the proposed CPHP would occur at the Parnassus Heights campus site under this alternative. In addition, this alternative would not result in an increase in impervious surfaces, or operational changes in the amount or quality of stormwater runoff at the campus site. Accordingly, this alternative would avoid the less than significant project and cumulative CPHP impacts related to the potential to violate water quality discharges requirements; degrade surface or groundwater quality; result in erosion and siltation; affect flooding; exceed the capacity of stormwater drainage systems; provide additional sources of polluted runoff; or impede or redirect storm flows.

Land Use and Planning

No new development associated with the CPHP would occur at the Parnassus Heights campus site under this alternative, and furthermore, this alternative does not propose amendments to the 2014 LRDP that would affect land use, the space program, or population. As a result, potential project and cumulative CPHP impacts, albeit less than significant, associated with conflict with land use plans, policies and regulations adopted for the purpose of avoiding or mitigating an environmental effect, or incompatibility with adjacent land uses, would not occur under this alternative.

Noise and Vibration

No new construction or demolition activities associated with the proposed CPHP would occur at the Parnassus Heights campus site under this alternative. Consequently, this alternative would avoid the significant and unavoidable project and cumulative construction- and demolition-generated noise effects, and significant but mitigable construction vibrations effects associated with the CPHP. Furthermore, no increase in operational permanent noise sources, and increase in traffic, would occur at the Parnassus Heights campus site under this alternative. As a result, this alternative would avoid the significant but mitigable project and cumulative impact related to permanent increases in ambient noise levels from stationary noise sources in excess of applicable noise standards, and avoid the less than significant project and cumulative impact associated with increases in traffic noise levels, that would be associated with the CPHP.

Population and Housing

This alternative would not result in an increase in the existing population at the Parnassus Heights campus site, and would not result in the development of any additional housing or demolition of any existing housing at the campus site. As a result, this alternative would avoid potential project and cumulative impacts, albeit less than significant, associated with inducement of population growth, and related new demand for housing, that are associated with the CPHP. Furthermore, this alternative would avoid the less than significant temporary impacts associated with displacement of people from existing housing, as would occur under the CPHP.

Public Services

This alternative would not result in an increase in development or population at the Parnassus Heights campus site. Consequently, this alternative would avoid the less than significant project and cumulative impacts associated with need for new or altered fire protection or public school facilities, associated with the CPHP.

Recreation

This alternative would not result in new development or an increase in population at the Parnassus Heights campus site. Consequently, this alternative would avoid the less than significant project and cumulative CPHP impacts of increasing the use of existing neighborhood and regional parks or other existing on- and off-campus recreational facilities, and with the construction of new recreational facilities.

However, this alternative would not provide those recreational improvements proposed under the CPHP, including the expanded Saunders Court, Promenade and Millberry Terrace.

Transportation

This alternative would not result in new development or an increase in population and associated traffic at the Parnassus Heights campus site. Consequently, this alternative would avoid the significant but mitigable CPHP construction-related impact to travel conditions along sidewalks and roadways serving the campus site. This alternative would also avoid the less than significant project and/or cumulative CPHP impacts of conflicts with programs, plans, ordinances or policies addressing the circulation system; increases in vehicle miles traveled (VMT); increases in hazard due to design features; and emergency access.

However, this alternative would not provide those transportation improvements, including for vehicle, bicycles and pedestrians, proposed under the CPHP to improve circulation and safety at the campus site, including implementation of Parnassus Avenue Streetscape Plan, the Fourth Street extension, the overcrossing and tunnel for Parnassus Avenue, widening of Medical Center Way, service corridor, Irving Street Arrival, and Promenade.

Utilities and Service Systems

This alternative would not result in new development or an increase in population and associated increases in public utility demands at the Parnassus Heights campus site. Consequently, this alternative would avoid the less than significant project and/or cumulative impacts that would occur under the CPHP associated with: construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities; effects on water supply availability during normal, dry and multiple dry years; effects on wastewater treatment capacity; and effects on capacity of local solid waste infrastructure and compliance with federal, state and local statutes and regulations related to solid waste.

However, this alternative would not provide those improvements proposed under the CPHP to upgrade the campus's aging infrastructure, and consequently, on-going maintenance issues associated with on-campus utilities would be greater than under the CPHP.

Relationship of No Project - No Development Alternative to Meeting Project Objectives

The No Project - No Development Alternative would not provide for implementation of any remaining but unbuilt authorized development under the 2014 LRDP, or for implementation of the development program proposed under the CPHP, or accommodate associated revisions to campus site functional zones, space program, estimated population, and update to the UCSF Greenhouse Gas Reduction Strategy. As such this potential alternative would not achieve most 2014 LRDP objectives for the Parnassus Heights campus site, and would not achieve the any of proposed CPHP objectives. As such, this alternative is considered both unrealistic and infeasible.

6.3.2 Alternative 1B: No Project - Development under 2014 LRDP Alternative

As discussed above, when the project is the revision of an existing land use plan, the no project alternative will be the continuation of the existing plan into the future, which in this case is the 2014 LRDP. Accordingly, the No Project - Development under 2014 LRDP Alternative consists of implementation of the remaining authorized 2014 LRDP improvements contemplated for the Parnassus Heights campus site. This would consist of approximately 0.47 million gsf of additional development at the Parnassus Heights campus site; the most notable related to a New Hospital, which would be smaller than the New Hospital proposed under the CPHP, as illustrated in **Figure 6-1**, and described below.

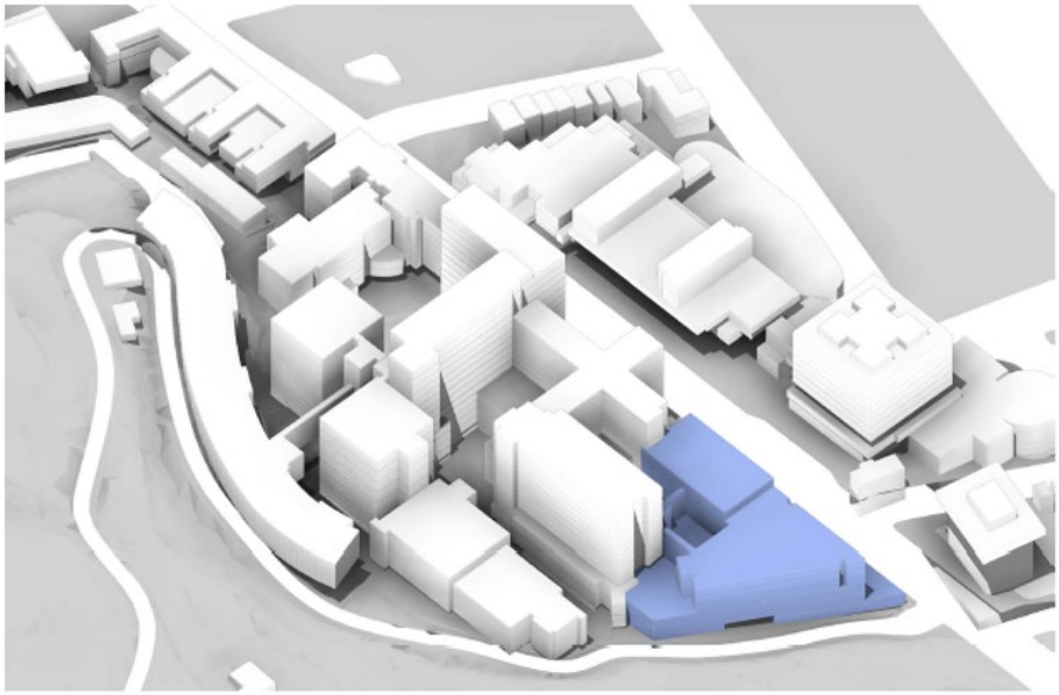


Figure 6-1
Alternative 1B: No Project - Development under 2014 LRDP

The 2014 LRDP envisioned a New Hospital of about 308,000 gsf and 140 beds on the site of LPPI to replace the inpatient facilities that were at Moffitt Hospital; renovation and reuse of Moffitt Hospital for outpatient, support and other campus uses; and reduction in the inpatient beds at Long Hospital to 299 beds, for a total of approximately 439 inpatient beds at Parnassus Heights. It should be noted that further study would be required to validate whether 140 beds would fit into a 308,000 gsf hospital building, given the space needs to meet current building codes, and other space requirements for modern hospitals.

The New Hospital was assumed to be seven stories and about 110 feet in height, plus an additional 17 feet for rooftop mechanical equipment. At the time of 2014 LRDP preparation, the New Hospital size was based on meeting basic clinical needs in response to SB 1953, with a minimal program that could fit on the site while staying as close as possible to the 3.55 million gsf space ceiling. This alternative also assumes no modification of the Reserve boundary that would occur under the proposed CPHP associated with the widening of Medical Center Way, and potentially, from construction of the New Hospital.

Previously approved but not yet implemented building demolition projects proposed under the 2014 LRDP, including the LPPI (subject to further CEQA clearance), Koret Vision Center, EHS, Surge, Woods, and Proctor buildings and other improvements identified in the 2014 LRDP would be implemented under this alternative. In addition, the Parnassus Avenue Streetscape Plan and certain utility improvements as envisioned in the 2014 LRDP would be implemented under this alternative. However, the CPHP development program at the campus site, including Initial and Future Phase projects, and supporting improvements and community investments, would not be implemented under this alternative.

Under this alternative, there would be no revisions to the 2014 LRDP as proposed by the CPHP, including no revisions to campus site functional zones, no revisions to the space program, no update to the population, and no revisions to the Regents' Resolution related to the space ceiling. However, following buildout of the 2014 LRDP before or by 2035, UCSF could seek approval for a future long range development plan to address any additional development and growth needs the University may have for its campus, including the Parnassus Heights campus site.

It is assumed that UCSF would continue implementation of the *Mount Sutro Open Space Reserve Vegetation Management Plan*, and on-going campus site maintenance programs and activities.

Comparison of Effects of No Project - Development under 2014 LRDP Alternative to the Proposed CPHP

Environmental conditions under this alternative would be essentially the same as those described for the Parnassus Heights campus site in the 2014 LRDP FEIR, except where noted, and are briefly summarized below.

Aesthetics, Wind and Shadow

Aesthetics

Implementation of the remaining authorized development contemplated for the Parnassus Heights campus site under the 2014 LRDP would occur, and no new development proposed under the CPHP would occur at the Parnassus Heights campus site under this alternative. Given the substantially smaller size and scale of development of this alternative in comparison to the CPHP, this alternative would have correspondingly less project and/or cumulative effects on: scenic vistas, and conflicts with applicable zoning and other regulations governing scenic quality compared to the CPHP, and similar to the proposed CPHP, these effects would be considered less than significant. This alternative would also have a lesser impact related to new sources of light and glare than under the CPHP, and similar to the proposed CPHP, the impact would be less-than-significant with mitigation.

Wind

Given the overall smaller size and scale of development of this alternative in comparison to the CPHP, it is expected that this alternative would have less project and cumulative wind hazard impacts compared to the CPHP. The 2014 LRDP Final EIR assessed the demolition of eight campus site buildings, including the LPPI, and determined that potential wind impacts from these development changes would be less than significant. The 2014 LRDP Final EIR also assessed the development of the New Hospital as envisioned in the 2014 LRDP (which was smaller than the New Hospital proposed in the CPHP) and determined that potential wind impacts from this development should be less than significant, while acknowledging that the New Hospital would be subject to further project-level review as necessary under CEQA. Furthermore, the 2014 LRDP Final EIR indicated that should the design shape of the New Hospital proposed under the 2014 LRPD change, it would be subject to mitigation requiring wind tunnel testing to verify compliance with the City's wind hazard criterion as defined in Planning Code Section 148, and as needed, would include feasible design measures to eliminate or reduce wind hazards. Thus, while this alternative would reduce the significant and unavoidable impacts of the CPHP related to wind hazards to less than significant, this conclusion would be subject to verification in a wind tunnel test of the hospital design.

Shadows

Given the overall smaller size and scale, and lower heights of development under this alternative in comparison to the CPHP, and based on the shadow impact analysis conducted in the 2014 LRDP Final EIR, this alternative would create correspondingly less new shadow than the proposed CPHP, and would contribute less to cumulative shadowing of publicly accessible open spaces when compared to the CPHP. Similar to the proposed CPHP, shadow impacts of this alternative would be less-than-significant.

Air Quality

This alternative would result in substantially less new construction and demolition activities compared to that proposed under the CPHP. Consequently, based on the air quality impact analysis conducted in the 2014 LRDP Final EIR, this alternative would avoid the significant but

mitigable impact associated with construction and demolition emissions of criteria pollutants of the CPHP; would similarly mitigate fugitive dust impacts to less-than-significant with implementation of BAAQMD dust control measures; and would avoid the significant but mitigable impact of construction and demolition emissions of toxic air contaminants (TACs) and associated health risks for nearby sensitive receptors of the CPHP.

Furthermore, this alternative would result in a substantially smaller increase in operational development and associated population and traffic increases associated with the Parnassus Heights campus site when compared to the CPHP. As a result, based on the air quality impact analysis conducted in the 2014 LRDP Final EIR, this alternative would avoid the significant and unavoidable project impact related to net increases of operational criteria pollutants that would occur under the CPHP; and avoid the significant but mitigable CPHP impact associated with exposure of sensitive receptors to substantial project and cumulative operational pollutant concentrations.

The 2014 LRDP Final EIR reported that since the emissions from development under the 2014 LRDP as a whole (i.e. not only development at the Parnassus Heights campus site) exceeded a BAAQMD threshold for increases in operational criteria air pollutants, that its emissions would be cumulatively considerable, and therefore a significant and unavoidable cumulative impact would occur and the same would be true for this alternative, as with the proposed CPHP. Lastly, this alternative would also reduce the significant but mitigatable impact associated with the CPHP's conflict with or obstruction of implementation of the applicable *Clean Air Plan*.

Biological Resources

This alternative would result in substantially less new construction and demolition activities, and a smaller increase in operational development compared to the CPHP, and would avoid intrusion into the Reserve. As a result, overall extent of construction and development-related impacts to biological resources under this alternative would be less than that associated with the CPHP. Based on the biological resource impact analysis in the 2014 LRDP Final EIR, significant project and/or cumulative construction-related effects on special-status plant and wildlife species of this alternative would be mitigated to less-than-significant with applicable survey and resource project measures, similar to the proposed CPHP. In addition, significant project and/or cumulative impacts associated with potential resident and migrating bird strikes from new development would be similarly mitigated to less-than-significant with implementation of bird safe building treatment measures; and this alternative would have a similar less than significant effect related to damage to or removal of landmark trees as the proposed CPHP.

Cultural Resources

This alternative would result in notably less overall demolition and physical alteration of historical resources eligible for listing in the National Register and/or California Register compared to the CPHP. This alternative would not demolish the School of Dentistry, and Aldea San Miguel Housing Buildings 8, 10, and 12. It would not modify the Reserve boundary; would not renovate HSIR East and West or the Medical Sciences Building; and would not impact potential future historical resources that would be impacted by CPHP buildout. This alternative

would also renovate and not demolish UC Hall or Millberry Union; and would renovate Saunders Court. As a result, this alternative would have substantially less impacts on historic resources and would substantially reduce the severity of related significant and avoidable impacts associated with the CPHP. While the 2014 LRDP Final EIR determined impacts to historical resources as a result of demolition of the LPPI would not be significant as the LPPI was not deemed a historical resource at that time, as discussed in Chapter 4, the LPPI has since been determined to be eligible for the National Register of Historic Places and the California Register of Historical Resources, and consequently, demolition of the LPPI under this alternative would result in a significant and unavoidable impact to historical resources, as under the CPHP.

This alternative would also result in overall less ground disturbing construction activities compared to the CPHP. Based on the cultural resources impact analysis in the 2014 LRDP Final EIR, potentially significant project and cumulative impacts to previously unknown archaeological resources, and human remains under this alternative would be mitigated to a less than significant level, similar to impacts with the proposed CPHP. Potential effects to previously undiscovered or buried tribal cultural resources under this alternative would similarly be expected to be mitigated to a less than significant level, as under the CPHP.

Energy

This alternative would result in substantially less new construction and demolition activities compared to the CPHP, and as a result, would have a lesser construction energy use impact compared to the CPHP. This alternative would also have less operational development and associated population increases compared to that associated with the CPHP, and consequently, would have less operational energy use than the CPHP. As such, the alternative would have a similarly less than significant project and/or cumulative impact associated with consumption of energy resources as the CPHP; and would have a similarly less than significant conflict with a state or local plan for renewable energy or energy efficiency.

Geology and Soils

This alternative would result in substantially less ground disturbing construction activities and new building construction compared to the CPHP. As a result, this alternative would have less potential project and/or cumulative impacts than the CPHP as it relates to effects of seismic ground shaking, liquefaction or unstable soils, landslides, and erosion from ground disturbance during construction.

Greenhouse Gas Emissions

This alternative would result in substantially less new construction or demolition activities compared to the CPHP, resulting in fewer greenhouse gas (GHG) emissions and as with the proposed CPHP, significant project and/or cumulative construction-related effects GHG emissions could be mitigated to less-than-significant with implementation of construction related GHG reduction measures. This alternative would also result in less overall development and associated population and traffic increases at the Parnassus Heights campus site than the CPHP, and consequently, operational-related GHG emissions would also be lower than with the CPHP. As with the proposed CPHP, the operational GHG emissions at the campus site would be less

than significant with implementation of required mitigation. Also, similar to the CPHP, this alternative would not conflict with applicable plans, policies or regulations adopted for the purpose of reducing the GHG emissions.

Hazards and Hazardous Materials

This alternative would result in substantially less new construction or demolition activities compared to the CPHP. In addition, this alternative would result in a substantially smaller increase in overall development, resulting in less of an increase in hazardous materials use than with the CPHP. With mitigation, resulting impacts would be less than significant in both the alternative and the CPHP, as would project and/or cumulative impacts associated with routine transport, use, or disposal of hazardous materials. In addition, project and/or cumulative impacts associated with potential accidental release of hazardous materials; and emitting and handling of hazardous materials within one-quarter mile of an existing or proposed school, for this alternative would be similarly less than significant.

Hydrology and Water Quality

This alternative would result in substantially less new construction or ground disturbing activities, and a smaller increase in new impervious surfaces at the campus site, compared to the CPHP. Accordingly, this alternative would further reduce the CPHP's less than significant project and/or cumulative impacts related to the potential to violate water quality discharges requirements; degradation of surface or groundwater quality; erosion and siltation; effect on flooding; effect on the capacity of stormwater drainage systems; additional sources of polluted runoff; or impedance or redirection of storm flows.

Land Use and Planning

This alternative would result in substantially less new development compared to the CPHP, and furthermore, this alternative would not include the amendments to the 2014 LRDP that are proposed under the CPHP to address the organization of land uses, the space program, and population. As a result, this alternative would further reduce the CPHP's less than significant project and/or cumulative impacts at the Parnassus Heights campus site associated with conflict with land use plans, policies and regulations adopted for the purpose of avoiding or mitigating an environmental effect, and incompatibility with adjacent land uses.

Noise and Vibration

This alternative would result in substantially less new construction and demolition activities compared to the CPHP. However, the 2014 LRDP Final EIR determined demolition activities proposed under the 2014 LRDP would result in a temporary significant and unavoidable noise impact, and that the combined construction and demolition projects would lead to a significant cumulative noise impact. Thus, this alternative would have the same significant and unavoidable construction noise impacts as the proposed CPHP, although project-related construction noise impacts could be less severe than anticipated in the 2014 LRDP EIR, since pile driving would not be required under the CPHP.

This alternative would result in fewer new permanent noise sources, and less of an increase in traffic, thereby resulting in less operational noise than would occur under the CPHP. As a result, this alternative would reduce the significant but mitigable project and/or cumulative impacts related to permanent increases in ambient noise levels from stationary noise sources in excess of applicable noise standards, and the less than significant project and/or cumulative impact associated with increases in traffic noise levels.

Population and Housing

This alternative would result in a substantially smaller increase in the population at the Parnassus Heights campus site compared to the CPHP, and would not demolish and replace any existing housing at the campus site. As a result, this alternative would have similarly less than significant project and/or cumulative impacts associated with inducement of population growth, and related new demand for housing, compared to the CPHP. Furthermore, this alternative would avoid the less than significant impact associated with temporary displacement of people from existing housing that would occur under the CPHP.

Public Services

This alternative would result in substantially less increase in development and population at the Parnassus Heights campus site compared to the CPHP. Consequently, this alternative would further reduce the CPHP's similarly less than significant project and/or cumulative impacts from the need for new or altered fire protection or public school facilities, as with the CPHP.

Recreation

This alternative would result in substantially less new development and increase in population at the Parnassus Heights campus site compared to the CPHP. Consequently, this alternative would further reduce the CPHP's less than significant project and/or cumulative impacts of increase in the use of existing neighborhood and regional parks or other existing on- and off-campus recreational facilities, and with the construction of new recreational facilities.

However, this alternative would not provide those recreational improvements proposed under the CPHP, including the Millberry Terrace, expanded Saunders Court and Promenade.

Transportation

This alternative would result in substantially less construction than that which would occur under the CPHP, resulting in less construction traffic and fewer temporary disruptions. As under the CPHP, significant construction-related transportation impacts under this alternative could be mitigated to a less than significant level.

This alternative would result in substantially less new development and less of an increase in population and associated traffic at the Parnassus Heights campus site compared to the CPHP. Consequently, this alternative would further reduce the less than significant project and/or cumulative CPHP impacts of conflicts with programs, plans, ordinances or policies addressing

the circulation system; increases in vehicle miles traveled (VMT); increases in hazard due to design features; and emergency access.[1]

However, this alternative would not provide those transportation improvements for vehicles, bicycles and pedestrians proposed under the CPHP to improve circulation and safety at the campus site, including the Fourth Street extension, the pedestrian overcrossing and tunnel for Parnassus Avenue, widening of Medical Center Way, service corridor, Irving Street Arrival, and Promenade.

Utilities and Service Systems

This alternative would result in substantially less new development and increase in population and associated increases in public utility demands at the Parnassus Heights campus site compared to the CPHP. Consequently, this alternative would further reduce the less than significant project and/or cumulative impacts of the CPHP, including those associated with: construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities; effects on water supply availability during normal, dry and multiple dry years; effects on wastewater treatment capacity; effects on capacity of local solid waste infrastructure, and compliance with federal, and state and local statutes and regulations related to solid waste.

However, while this alternative provides for some upgrades of aging infrastructure, it would not provide all the improvements proposed under the CPHP to upgrade infrastructure, and consequently, on-going maintenance issues associated with on-campus utilities may be greater than under the CPHP.

Relationship of No Project - Development under 2014 LRDP Alternative to Meeting Project Objectives

The No Project - Development under the 2014 LRDP Alternative would provide for implementation of remaining but unbuilt authorized development under the 2014 LRDP, but would not provide for implementation of the development program proposed under the CPHP. As such this potential alternative would achieve the 2014 LRDP objectives for the Parnassus Heights campus site, but would not achieve the proposed CPHP objectives.

It should be noted that, the hospital program assumed under this alternative is the version envisioned under the 2014 LRDP. The New Hospital contemplated under the 2014 LRDP would provide for 140 beds, compared to the 384 beds proposed for the New Hospital under the CPHP. In total, when considering beds at Long Hospital and the New Hospital, this alternative would result in 236 fewer beds at the Parnassus Heights campus site (439 beds under this alternative versus 675 beds under the CPHP). As discussed in the Chapter 3, *Project Description*, following the preparation of the 2014 LRDP, continued planning for the New Hospital resulted in the

[1] It should be noted the 2014 LRDP Final EIR identified significant and unavoidable cumulative level of service (LOS) impacts at several study intersections. However, as discussed in the CPHP Draft EIR, Section 4.15, *Transportation,* pursuant to CEQA Guidelines Section 15064.3, VMT is now used as the appropriate measure of assessing transportation impacts instead of vehicle LOS.

realization that the New Hospital and associated facilities would require more beds to meet the demand for inpatient care for a growing and aging Bay Area population, and to allow for the capacity to provide inpatient health care in times of severe strain without resorting to reducing or canceling non-essential surgeries to create bed capacity. The New Hospital proposed under this alternative would also not have sufficient space to accommodate modern regulatory requirements and industry standards of contemporary hospitals, such as construction codes, sizes of operating rooms, ratio of operating rooms to pre-and post-recovery areas, and space for privacy and infection control issues.

6.3.3 Alternative 2: Reduced Project

Description

This alternative is similar to the proposed CPHP with the following notable exceptions: 1) development of a smaller New Hospital in conjunction with renovation of Moffitt Hospital to provide for continued use of Moffitt Hospital for inpatient beds (see **Figure 6-2** below), 2) historic preservation of architecturally significant buildings, and 3) Future Phase Aldea Housing and child care facilities would be developed in the Initial Phase rather than later during buildout of the CPHP. Each of these aspects of the alternative are described below.



Figure 6-2
Alternative 2: Reduced Project

Smaller New Hospital and Renovation of Moffitt Hospital: This alternative assumes development of a New Hospital that would be reduced in size in terms of total square footage, building footprint, building height, and bed capacity, from that proposed under the CPHP. This alternative assumes the New Hospital would be approximately 629,000 gsf (a reduction in size of 326,000 gsf compared to the New Hospital proposed under the CPHP), and 12 stories and 212 feet in height (a reduction of 4 stories and about 82 feet). This alternative assumes the New Hospital would contain approximately 288 beds, instead of the 384 inpatient beds as proposed at the New Hospital under the CPHP. In this alternative, Moffitt Hospital would be renovated to meet SB1953 seismic standards and to meet current code standards for inpatient use, and would include about 96 beds. Long Hospital would house 291 beds, as under the CPHP. In total, this alternative would provide for 675 beds at the Parnassus Heights campus site, the same as under the CPHP. It is assumed that the renovation of Moffitt Hospital, including for beds would not take place after 2030, once the New Hospital was complete. As such, it would not provide the same number of beds required by the program (675) for over 4 years (by 2034 approximately).

By occupying a smaller building footprint, the New Hospital under this alternative would potentially avoid the need to modify the adjacent Reserve boundary, as potentially could occur with the CPHP, although the proposed widening of Medical Center Way would still be necessary and could encroach into the Reserve under this alternative. As under the CPHP, the New Hospital under this alternative would have a similar connecting pedestrian bridge across Parnassus Avenue, and a tunnel beneath Parnassus Avenue.

Historic Preservation: This alternative assumes historic preservation of existing architecturally significant buildings on the campus site (individually eligible for listing in the National Register and/or California Register) that are proposed for demolition under the CPHP, including UC Hall, the Dentistry Clinics building, and Aldea San Miguel Housing Buildings 8, 10, and 12. It is assumed these buildings may be adaptively reused, as feasible. Other buildings on the campus site that are historically significant for events, but not architecture (i.e., LPPI and Millberry Union) are assumed to be demolished under this alternative, as under the CPHP.

As such, development that was proposed at the sites of these historical resources under the CPHP would not occur under this alternative. This would include the proposed RAB (on the site of UC Hall), some of the new program adjacent to the RAB (on the site of the Dental Clinics building), and three proposed 8-story housing structures and one five-story housing structure in the Aldea Housing complex (on the sites of Aldea San Miguel Housing Buildings 8, 10, and 12). Because the Dental Clinics building would be retained under this alternative, the full Fourth Street extension between Parnassus Avenue and Kirkham Street, and connecting service corridor, proposed under the CPHP would not occur under the alternative. The LPPI would be demolished under this alternative as with the CPHP.

Aldea Housing and Child Care Developed in Initial Phase: The nine housing structures (a net increase of 190 units) and child care facilities that are proposed at the Aldea Housing complex in the Future Phase under the CPHP would be implemented in the Initial Phase under this alternative.

It is assumed that similar to under the CPHP, the proposed West Side Housing project (430 units) would be developed in the Future Phase of this alternative. In total, this alternative would provide a

total of 620 net new housing units (142 less than under the CPHP due to above-described preservation of Aldea San Miguel Housing Buildings 8, 10, and 12).

This alternative would include all revisions to the 2014 LRDP that are proposed in conjunction with the CPHP, including revisions to campus site functional zones (with the exception being that modifications to Open Space Reserve boundary would be related to the widening of Medical Center Way only), revisions to the space program, update of the projected population, revisions to the Regents' Resolution, and update of the UCSF Greenhouse Gas Reduction Strategy.

It is assumed that UCSF would continue implementation of the *Mount Sutro Open Space Reserve Vegetation Management Plan*, and on-going campus site maintenance programs and activities.

Comparison of Effects of Reduced Project Alternative to the Proposed CPHP

Aesthetics, Wind and Shadow

Aesthetics

This alternative would result in overall less and smaller scale new development at the campus site compared to the CPHP. As discussed above, under this alternative, this New Hospital would occupy a smaller footprint, and would contain four less floors and would be 82 feet shorter than the New Hospital proposed under the CPHP. Furthermore, the proposed RAB, some of the proposed new program adjacent to the RAB, and four proposed Aldea housing structures would not be built under this alternative (retaining the existing structures on those sites instead). In addition, the full extension of Fourth Avenue between Parnassus Avenue and Kirkham Street and connecting service corridor, proposed under the CPHP would not occur under this alternative.

Scenic Vistas

From the viewpoint at Grandview Park, the New Hospital under this alternative would rise lower on the skyline compared to the New Hospital proposed under the CPHP, and would similarly only slightly obstruct the existing view of downtown San Francisco from this perspective, and would not obstruct scenic views from this park in other directions. This view would also not include the RAB and development on the site of Dental Clinics building that is proposed under the CPHP, as those buildings would not be developed under this alternative. As under the CPHP, this alternative would not result in a substantial adverse impact on scenic vistas from this viewpoint.

When considering available vantage points from within the Reserve, such as from the Historic Trail, given its lower height, the New Hospital under this alternative would incrementally obstruct less of the northward scenic views across the campus core. Given the overall lack of long-range scenic views from within the Reserve, implementation of the alternative would not adversely affect scenic vistas from within the Reserve, similar to the proposed CPHP.

When considering the above, and additionally that some new scenic views and new publicly-accessible open space that would be created from the campus site by this alternative (e.g. by the

Millberry Terrace), albeit less than proposed under the CPHP, the impact on scenic vistas would be less than significant.

Scenic Quality

As under the CPHP, this alternative would have an adverse effect related to scenic quality if it were to conflict with UCSF 2014 LRDP policies governing scenic quality.

2014 LRDP Sub-objective 1B. Under this alternative, the New Hospital would be visibly shorter as seem from off-site vantage points than the New Hospital proposed under the CPHP. Additionally, since the 12-story hospital under this alternative would contain a smaller footprint, it would also appear less broad from certain perspectives than the New Hospital proposed under the CPHP. At 212 feet in height, the New Hospital under this alternative would also not exceed the height limits of the City's 220-F height district that would occur under the CPHP, although this alternative would exceed the height limit within the City's 65-D height district, although to a lesser extent than under the CPHP.

In addition, four of the housing structures proposed in the Aldea Housing complex under the CPHP (on the sites of Aldea San Miguel Housing Buildings 8, 10, and 12) would not be constructed under this alternative, and consequently, this alternative would avoid exceeding the City's 40-X height limits at those sites under the CPHP; although the housing proposed on the other nine existing housing sites would still exceed the City's 40-X height limit.

2014 LRDP Sub-objective 1C. The development program under this alternative would result in approximately 75 percent of the net increase in development on the campus site proposed under the CPHP, and a correlating smaller increase in the scale and density. Given its shorter height and smaller mass, the New Hospital under this alternative would contrast less sharply both in height and scale with the existing residential development to the east than the New Hospital proposed under the CPHP. The proposed New Hospital under this alternative would be nearly 30 feet taller than the tallest existing campus site building, as compared to over 100 feet taller than the tallest existing campus site building under the CPHP. The New Hospital would also appear as a less prominent newly visible feature in the viewsheds from nearby neighborhoods, such as those along Parnassus Avenue, 17th Street, and Willard Street at Belmont Avenue, compared to the New Hospital under the CPHP. As discussed above, certain other development proposed under the CPHP, including RAB and other research and development uses on the UC Hall and Dental Clinics buildings sites; and four housing structures proposed on the sites of Aldea San Miguel Housing Buildings 8, 10, and 12, would also not be constructed under this alternative. Development proposed under this alternative, including the New Hospital, would, on balance, be generally more consistent than the CPHP with 2014 LRDP sub-objective 1C in terms of height and scale.

With respect to sensitivity to the surrounding landscape as set forth in 2014 LRDP sub-objective 1C, with its smaller footprint, the New Hospital under this alternative would avoid potential encroachment into the Reserve that could occur under the CPHP, although the widening of the Medical Center Way under this alternative would still encroach into the hillside in the Reserve to the east. Similar to the CPHP, UCSF would replace any area of the Reserve lost due to new development under this alternative by designating a new area elsewhere on the campus site as

Reserve in an amount equal to or greater than the area lost. It is assumed that new development along Parnassus Avenue immediately west of UC Hall would occur under this alternative, and as such, most or all of the existing grove of redwood trees adjacent to UC Hall would be removed, similar to the CPHP.

To the extent this sub-objective concerns noise generation, as mitigated, new buildings developed under the alternative would result in a less-than-significant effect on ambient noise levels pursuant to applicable noise standards, similar to under the CPHP.

2014 LRDP Sub-objective 1D. Similar to the CPHP, proposed new buildings along Parnassus Avenue under this alternative would be constructed concurrent with the proposed Parnassus Avenue Streetscape Plan. The Streetscape Plan improvements would serve to enhance the public realm as called for in UCSF's Physical Design Framework, and would be consistent with 2014 LRDP sub-objective 1D.

In summary, as under the CPHP, to the extent this alternative would be inconsistent with applicable 2014 LRDP objectives as described above, it is assumed UCSF would seek amendments to the 2014 LRDP to bring this alternative and 2014 LRDP into conformity. Therefore, because this alternative would include provisions regarding scenic quality that would apply broadly to the alternative based on UCSF's Physical Design Framework, with amendments to the 2014 LRDP, similar to the CPHP, this alternative would not conflict with the 2014 LRDP objectives related to scenic quality, and the impact would be less than significant.

This alternative would also have incrementally less impact related to new sources of light and glare compared to the CPHP, given the overall less development proposed, and the overall impact would be less-than-significant with mitigation, as with the proposed CPHP.

Wind

Because the New Hospital under this alternative would occupy a smaller footprint than the proposed New Hospital, because this alternative's New Hospital would not encroach into the adjacent Reserve, and because there would be more unbuilt area between the New Hospital and the steep slope to the east across Medical Center Way, the New Hospital under the Reduced Project Alternative would likely result in incrementally lower wind speeds near the northeast corner of the New Hospital compared to those under the CPHP. Additionally, the reduced height of the New Hospital under this alternative could incrementally reduce wind speeds along Parnassus Avenue near the hospital, compared to those under the CPHP. Nevertheless, the New Hospital under this alternative would still represent a substantial increase in building height and bulk at the east end of the campus' Parnassus Avenue frontage, and thus could result in exceedances of the City's pedestrian wind hazard criterion, as with the CPHP. This would be a significant effect. However, unlike the CPHP, this alternative would retain UC Hall, the westernmost campus site building along the south side of Parnassus Avenue, the Dental Clinics building, which is set back more than 100 feet south of Parnassus Avenue, and the School of Nursing building. The Reduced Project Alternative, like the CPHP, would also retain the other taller buildings along the south side of Parnassus Avenue, including the existing Clinical Sciences and Medical Sciences buildings and Moffitt Hospital. Because the entire west end of

this street wall would be retained under the Reduced Project Alternative, this alternative would have little or no effect on pedestrian-level winds there, thus avoiding potential significant wind impacts adjacent to the RAB that would occur under the CPHP.

Also unlike the CPHP, the Reduced Project Alternative would retain the three oldest and historic Aldea housing buildings, which would preclude the development of the tallest of the new Aldea housing buildings that would be built under the CPHP. This would avoid the CPHP's potential exceedance of the wind hazard criterion at the Aldea Housing site. Finally, the Reduced Project Alternative would include the Irving Street Arrival, as would the CPHP, and therefore this alternative could result in a wind hazard exceedance, albeit a small potential, and a significant effect at this location that would be similar to what could occur under the CPHP.

Implementation of CPHP Mitigation Measure AES-4 (Design new buildings to minimize wind impacts at pedestrian level) would reduce the severity of the potentially significant wind impact. However, as under the CPHP, it cannot be stated with certainty that no wind hazard exceedances would result from this alternative, and therefore this impact could be significant even with mitigation under the Reduced Project Alternative.

Shadows

This alternative would result in a New Hospital 82 feet shorter than under the CPHP, and additionally, the following development proposed under the CPHP would not occur under this alternative: the 130-foot RAB, 45 to 130-foot tall development on the site of the Dental Clinics building, and three 8-story housing structures and one five-story housing structure at the Aldea Housing complex. Other development proposed at the campus site under this alternative is assumed to have generally the same building heights as that proposed under the CPHP. Shadow from this alternative could reach the three parks and two schoolyards receiving net new shadow from the CPHP, but because this alternative would result in a reduction in buildings and building heights compared to the CPHP, shadow effects from this alternative would be expected to have less impact than the CPHP in terms of the amount or duration of new shadow. As under the CPHP, shadow under this alternative would affect publicly accessible open spaces, but not to an extent that would adversely or substantially impact the use and enjoyment of open spaces. Therefore, as under the CPHP, the overall shadow impact under this alternative would be similarly less than significant on a project-level and cumulative basis.

Air Quality

This alternative would have less new construction and demolition activities than that which would occur under the CPHP. Consequently, this alternative would have less impact associated with construction and demolition emissions of criteria pollutants, and toxic air contaminants (TACs) and associated health risks at sensitive receptors, and would similarly mitigate those effects to less-than-significant with the use of clean construction equipment and implementation of BAAQMD dust control measures.

This alternative would result in approximately 25 percent less development, and less associated population and traffic increases, compared to the CPHP. The specific reduction in traffic generated under this alternative compared to those generated under the CPHP would depend on a number of

factors, including the specific levels of instruction, clinical, research and support uses that would be implemented under this alternative, the potential adaptive reuse of UC Hall, the Dental Clinics building, and other factors. As a result, while operations under this alternative would generate fewer criteria pollutant emissions than operations under the CPHP, the specific reduction in emissions may not be sufficient to eliminate the CPHP's significant impact related to PM_{10} emissions (which are approximately 37% over the significance threshold). With mitigation measures requiring project-level operational measures and TDM enhancement measures, the PM_{10} emissions are still conservatively estimated to be significant and unavoidable under this alternative. This alternative would also have less project and cumulative impact associated with exposure of sensitive receptors to substantial project and cumulative operational pollutant concentrations, and require similar mitigation to reduce diesel particulate matter (DPM) which would mitigate those significant effects to less-than-significant. Lastly, this alternative would have less impact associated with the CPHP's conflict with or obstruction of implementation of the applicable *Clean Air Plan*, and with mitigation the impact would similarly be reduced to less-than-significant.

Biological Resources

This alternative would have less new construction and demolition activities compared with the CPHP, and would avoid potential intrusion into the Reserve from the New Hospital. As a result, the overall extent of construction and development-related impacts to biological resources under this alternative would be less than that associated with the CPHP. Significant project and/or cumulative construction-related effects on special-status plant and wildlife species of this alternative would be similarly mitigated to less-than-significant with applicable survey and resource project measures similar to the proposed CPHP. Also, significant project and/or cumulative impacts associated with potential resident and migrating bird strikes from new development would be similarly mitigated to less-than-significant with implementation of bird safe building treatment measures; and this alternative would have a similar less than significant effect related to damage to or removal of landmark trees.

Cultural Resources

This alternative would preserve most architecturally significant historical resources eligible for listing in the National Register and California Register at the campus site that would be demolished under the CPHP. Consequently, this alternative would avoid demolition of UC Hall, Dental Clinics building, and Aldea San Miguel Housing Buildings 8, 10, and 12, that would be demolished under the CPHP. Rather, it is assumed these buildings may be adaptively reused, as feasible. Since the New Hospital would not intrude into the Reserve, this alternative could also have less impact to this historical cultural landscape than under the CPHP. However, it is assumed other existing and/or future historical resources that may be demolished or physically altered under the CPHP (e.g., Millberry Union) would also be demolished or physically altered under this alternative. The LPPI would still be demolished to make way for the New Hospital. Overall, this alternative would have less impacts to historical resources than the CPHP, although the impact would still be significant and unavoidable.

This alternative would also result in less ground disturbing construction activities compared to the CPHP, and therefore have less potential to affect archaeological and tribal cultural resources.

Potentially significant project and cumulative impacts to previously unknown archaeological resources, human remains, and/or tribal cultural resources under this alternative would be similarly mitigated to a less than significant level as under the CPHP.

Energy

This alternative would result in less construction and demolition activities compared to the CPHP and as a result, would have less construction energy use impact compared to the CPHP. This alternative would also have approximately 25 percent less increase in development, and less associated population and traffic increases, compared to the CPHP, and consequently, less operational energy use than the CPHP. As such, the alternative would further reduce the less than significant project and/or cumulative impact associated with consumption of energy resources as under the CPHP; and would have a similarly less than significant conflict with a state or local plan for renewable energy or energy efficiency.

Geology and Soils

This alternative would result in less ground disturbing construction activities and new building construction compared to the CPHP, and therefore have overall less potential to result in effects on geology, soils and seismicity. Accordingly, this alternative would have less potential project and/or cumulative impacts than the CPHP as it relates to effects of seismic ground shaking, liquefaction or unstable soils, landslides, and erosion from ground disturbance during construction, and those effects would be similarly less than significant with compliance with applicable regulatory requirements and the implementation of geotechnical design recommendations and/or mitigation.

Greenhouse Gas Emissions

This alternative would result in less construction or demolition activities compared to the CPHP. As a result, this alternative would reduce the significant but mitigable project and/or cumulative construction-related GHG emissions effects at the Parnassus Heights campus site as under the CPHP. This alternative would have approximately 25 percent less increase in development, and less associated population and traffic increases at the Parnassus Heights campus site than the CPHP, and consequently, operational-generated GHG emissions would be less than the emissions under the CPHP. Consequently, this alternative would reduce the significant but mitigable impacts of the CPHP related to operational GHG emissions. Similar to the CPHP, this alternative would not conflict with applicable plans, policies or regulations adopted for the purpose of reducing the GHG emissions.

Hazards and Hazardous Materials

This alternative would result in less new construction or demolition activities compared to the CPHP. This alternative would also result in less increase in development, and the associated increases in hazardous materials use that would occur with operations under the CPHP. Significant project and/or cumulative impacts associated with routine transport, use, or disposal of hazardous materials under this alternative would be similarly mitigated to a less than significant level with compliance with applicable, federal and State laws and regulations

regulating transportation, management, and disposal of hazardous materials and wastes. In addition, project and/or cumulative impacts associated with potential accidental release of hazardous materials; and emitting and handling of hazardous materials within one-quarter mile of an existing or proposed school, for this alternative would be similarly less than significant.

Hydrology and Water Quality

This alternative would result in less new construction and groundbreaking activities compared to the CPHP; and an incrementally smaller increase in new impervious surfaces at the campus site, compared to the CPHP, and thus, generate incrementally less runoff. Project and/or cumulative impacts related to the potential to violate water quality discharges requirements; degradation of surface or groundwater quality; erosion and siltation; effect on flooding; effect on the capacity of stormwater drainage systems; additional sources of polluted runoff; or impedance or redirection of storm flows, would be reduced compared to the proposed project and similarly less than significant, with compliance with the construction BMPs required by the NPDES Construction General Permit and operational design measures and LID stormwater requirements controls of the Phase II MS4 permit.

Land Use and Planning

This alternative would result in less new development compared to the CPHP, although it would include the amendments to the 2014 LRDP that are proposed under the CPHP affecting the organization of land uses (with the exception of extent of area of the Reserve redesignated), the space program, and population, although with smaller increases than under the CPHP. Overall, this alternative would have less project and/or cumulative CPHP impacts at the Parnassus Heights campus site associated with conflict with land use plans, policies and regulations adopted for the purpose of avoiding or mitigating an environmental effect, and incompatibility with adjacent land uses. With the proposed amendment to the 2014 LRDP, these effects would be less than significant, similar to with the proposed CPHP.

Noise and Vibration

This alternative would have less new construction and demolition activities as that proposed under the CPHP. Nonetheless, the construction activities would be sufficient to result in project and cumulative construction-generated noise effects that would be significant and unavoidable under this alternative, similar to with the proposed CPHP. Proposed mitigation requiring implementation of construction noise control measures, limits on construction hours, and pile installation noise-reducing techniques would reduce this impact, but not to a level that is less than significant. Construction vibration impacts under this alternative would be significant but mitigable with implementation of vibration control measures, as under the CPHP.

This alternative would generate less traffic than the CPHP, and consequently, transportation noise generated by this alternative would similarly be less than significant. With less development, the significant project and/or cumulative impact related to permanent increases in ambient noise levels from stationary noise sources in excess of applicable noise standards under this alternative would be less than with the proposed CPHP and could be mitigated to a less than significant level with implementation of operational noise control measures, similar to the CPHP.

Population and Housing

This alternative would have a smaller increase in the population at the Parnassus Heights campus site compared to the CPHP, demolish less existing housing at the campus site than the CPHP, and develop less new housing at the campus site than the CPHP, although more housing would be provided in the Initial Phase. For these reasons, this alternative would have similar less than significant project and/or cumulative impacts associated with inducement of population growth, and related new demand for housing, when compared to the CPHP.

Public Services

This alternative would result in a smaller increase in development and population at the Parnassus Heights campus site compared to the CPHP, resulting in lower demand for public services. For this reason, project and/or cumulative impacts associated with need for new or altered fire protection or public school facilities would be less than significant, similar to with the proposed CPHP.

Recreation

This alternative would result in less new development and smaller increase in population at the Parnassus Heights campus site compared to the CPHP. This alternative would also propose somewhat less new recreational improvements as that proposed under the CPHP, since it would not include development of the CPHP-proposed Promenade. Nonetheless, project and/or cumulative impacts of increase in the use of existing neighborhood and regional parks or other existing on- and off-campus recreational facilities, and with the construction of new recreational facilities under this alternative would remain less-than-significant, similar to the proposed CPHP.

Transportation

This alternative would result in less new construction at the Parnassus Heights campus site compared to the CPHP. Consequently, the significant construction phase impact to travel conditions along sidewalks and roadways serving the campus site under this alternative would be similarly mitigated to a less than significant level with implementation of construction coordination and monitoring measures.

This alternative would also result in less overall new development, and less increase in population and associated operational traffic, than under the CPHP. This alternative would also provide many of same transportation improvements for vehicles, bicycles and pedestrians proposed under the CPHP to improve circulation and safety at the campus site, including the pedestrian overcrossing and tunnel for Parnassus Avenue, widening of Medical Center Way, and Irving Street Arrival, although it would not include the full Fourth Street extension proposed under the CPHP, and connecting service corridor or Promenade. With less operational traffic, this alternative would have less than significant project and/or cumulative impacts related to conflicts with programs, plans, ordinances or policies addressing the circulation system; increases in VMT; increases in hazard due to design features; and emergency access, similar to the proposed CPHP.

Utilities and Service Systems

This alternative would result in less new development and increase in population, and associated increases in public utility demands at the Parnassus Heights campus site, compared to the CPHP. As a result, project and/or cumulative impacts related to utilities and service systems under this alternative would be similarly less-than-significant as with the CPHP. This would include impacts associated with: construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities; effects on water supply availability during normal, dry and multiple dry years; effects on wastewater treatment capacity; effects on capacity of local solid waste infrastructure, and compliance with federal, and state and local statutes and regulations related to solid waste.

Relationship of Reduced Project Alternative to Meeting Project Objectives

As discussed under the description of the Reduced Project Alternative, this alternative would provide for approximately 25 percent less new development at the Parnassus Heights campus site when compared to the CPHP, and would not develop those transportation and utility improvements proposed under the CPHP (e.g. Fourth Street extension, service corridor, Promenade, etc.). Consequently, this alternative would not fully meet the CPHP project objectives, for space, urban design and mobility.

Notably, this alternative would include a smaller New Hospital that would be approximately one-third smaller than the New Hospital under the CPHP. As such, this alternative assumes the New Hospital would contain approximately 288 beds, instead of the 384 inpatient bed as proposed at the New Hospital under the CPHP. It is further assumed that Moffitt Hospital would include about 96 beds following its renovation to meet SB 1953 seismic standards; and Long Hospital would provide 291 beds; for a total 675 beds at the Parnassus Heights campus site - the same total bed count as under the CPHP. However, even with a renovation of Moffitt Hospital under this alternative, it would continue to be outdated, undersized, and inflexible, including for emergency room, surgery rooms, procedure rooms, patient rooms, the clinical lab, pharmacy, and sterile processing spaces. In addition, floor to ceiling heights in Moffitt Hospital are not tall enough to accommodate contemporary equipment, and as such, are considered inadequate for modern hospital operations. In addition, since under this alternative the renovation of Moffitt Hospital beds would take place after 2030, once the New Hospital was complete, it would not provide the same number of beds required by the program (675) for over 4 years (by 2034 approximately). For these reasons, this alternative would not fully meet the CPHP project objectives for the New Hospital.

This alternative would also not develop the RAB proposed under the CPHP on the site of UC Hall or other new programmed uses proposed on the site of the Dental Clinics building, as those existing historical resources would be preserved. While these existing historical buildings could be adaptively reused for other purposes, they are considered outdated, undersized, and too inflexible to be practical for the research and academic uses proposed at these sites under the CPHP. Accordingly, since the RAB as proposed under the CPHP would not be developed under this alternative, this alternative would not fully meet the CPHP project objectives for the RAB

and for increased state-of-the-art research facilities. Since the Irving Street Arrival would be developed under this alternative similar to that proposed under the CPHP, this alternative would meet the CPHP project objectives for the Irving Street Arrival.

This alternative would also develop 142 less new housing units in the Aldea Housing complex than proposed under the CPHP. Therefore, this alternative would not fully meet the CPHP project objectives for the Aldea Housing Densification.

6.3.4 Alternative 3: CPHP including New Hospital - 19-Story Option

This alternative is identical to the proposed CPHP, with the exception of the design of the New Hospital. Under this alternative, the New Hospital would be approximately the same square footage (955,000 gsf) and have the same bed capacity (384 beds) as that proposed under the CPHP. However, the building would occupy a smaller footprint and would be taller than the New Hospital proposed under the CPHP. Specifically, the New Hospital under this alternative would be three floors taller (19 stories vs. 16 stories) and approximately 47 feet taller (i.e., total of 341 feet vs. 294 feet) than the design proposed under the CPHP, as illustrated in **Figure 6-3**.

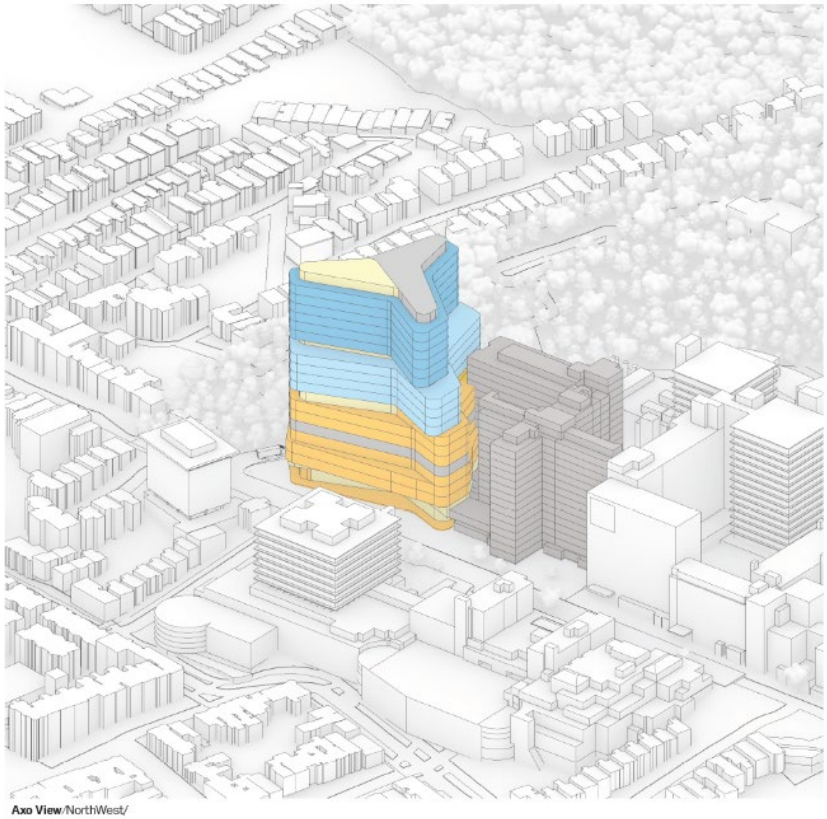


Figure 6-3
Alternative 3: CPHP including New Hospital - 19-Story Option

By occupying a smaller building footprint, the New Hospital under this alternative would avoid the potential need to modify the adjacent Reserve boundary associated with the New Hospital under the proposed CPHP, although the proposed widening of Medical Center Way would still be necessary and could encroach into the Reserve under this alternative. As under the CPHP, the New Hospital under this alternative would have a similar connecting pedestrian bridge across Parnassus Avenue, and a tunnel beneath Parnassus Avenue.

This alternative assumes the same revisions to the 2014 LRDP that are proposed in conjunction with the CPHP would occur under this alternative, including revisions to campus site functional zones (with the exception being modifications to the Open Space Reserve boundary would be related to the widening of Medical Center Way only), revisions to the space program, update to the projected population, revisions to the Regents' Resolution, and update to the UCSF Greenhouse Gas Reduction Strategy.

It is assumed that UCSF would continue implementation of the *Mount Sutro Open Space Reserve Vegetation Management Plan*, and on-going campus site maintenance programs and activities.

Comparison of Effects of CPHP including New Hospital - 19-Story Option to the Proposed CPHP

Aesthetics, Wind and Shadow

Aesthetics

All development proposed at the Parnassus Heights campus site under this alternative would be identical to that proposed under the CPHP, with the exception of the New Hospital, which would occupy a smaller footprint, but would contain an additional three floors and would be 47 feet taller than the New Hospital proposed under the CPHP.

Visual simulations were prepared for this alternative from a number of the same publicly accessible vantage points prepared for the proposed CPHP, and using the same digitized photographs and computer modeling techniques. As with the proposed CPHP, the visual simulations prepared for this alternative are based on a simple massing plan, and not on actual building designs.

Scenic Vistas

From the viewpoint at Grandview Park looking east, the New Hospital under this alternative would rise higher, but also appear incrementally less broad, on the skyline, compared to the New Hospital proposed under the CPHP, would only slightly obstruct the existing view of downtown San Francisco from this perspective, and would not obstruct scenic views from this park in other directions. Consequently, as with the CPHP, this alternative would not result in a substantial adverse impact on scenic vistas from this viewpoint.

When considering available vantage points from within the Reserve, such as from the Historic Trail, given its taller height, the New Hospital under this alternative would obstruct more sky in the northward scenic views across the campus core. However, as with the conclusion reached for

the CPHP, given the overall lack of long-range scenic views from within the Reserve, implementation of the alternative would similarly not adversely affect scenic vistas from within the Reserve.

When considering the above, and additionally that new scenic views and new publicly-accessible open space that would be created from the campus site by this alternative (e.g. by the Millberry Terrace, expanded Saunders Court and the Promenade)– similar to the CPHP – the impact on scenic vistas from this alternative would be less than significant.

Scenic Quality

As under the CPHP, this alternative would have an adverse effect related to scenic quality if it were to conflict with UCSF 2014 LRDP policies governing scenic quality.

2014 LRDP Sub-objective 1B. From the viewpoint of Kezar Triangle looking south, under this alternative, the New Hospital would be visibly taller than the New Hospital proposed under the CPHP. However, since the 19-story hospital under this alternative would contain a smaller footprint, it would also appear somewhat less broad from this perspective than the New Hospital proposed under the CPHP. Nevertheless, with the 19-story hospital option at 47 feet taller than the New Hospital proposed under the CPHP, it would further exceed the height limits of the City's 65-D and 220-F height districts. Elsewhere on the campus site, exceedances of City height districts by other development proposed under this alternative (e.g., Millberry Union, Aldea Housing structures) would be identical to those under the proposed CPHP.

2014 LRDP Sub-objective 1C. **Figures 6-4** to **6-7** present a number of other views of the development program under this alternative. Similar to the CPHP, implementation of the development program of this alternative would result in a substantial increase in development, and associated increase in the scale and density, on the campus site. As shown in Figures 6-5 to 6-7, the New Hospital would similarly contrast sharply both in height and scale with the existing residential development to the east. At 341 feet in height, the proposed New Hospital under this alternative would also be over 150 feet taller than other existing buildings on the campus site. Similar to that under the CPHP, under this alternative, the New Hospital would be a prominent newly visible feature in the viewsheds from nearby neighborhoods, such as those along Parnassus Avenue (please see Figure 6-5), 17th Street (see Figure 6-6), and Willard Street at Belmont Avenue (see Figure 6-7).[2] Similar to the CPHP, while other development proposed under this alternative (e.g., in the central and west areas of the campus core, and in the Aldea Housing complex), would, on balance, be generally consistent with 2014 LRDP sub-objective 1C, the height and scale of the proposed New Hospital under this alternative would be inconsistent with 2014 LRDP sub-objective 1C.

[2] For comparison of visual simulations of the CPHP from the same viewpoints, please see Section 4.1, Figures 4.1-15, 4.1-16, 4.1-17 and 4.1-18, respectively.



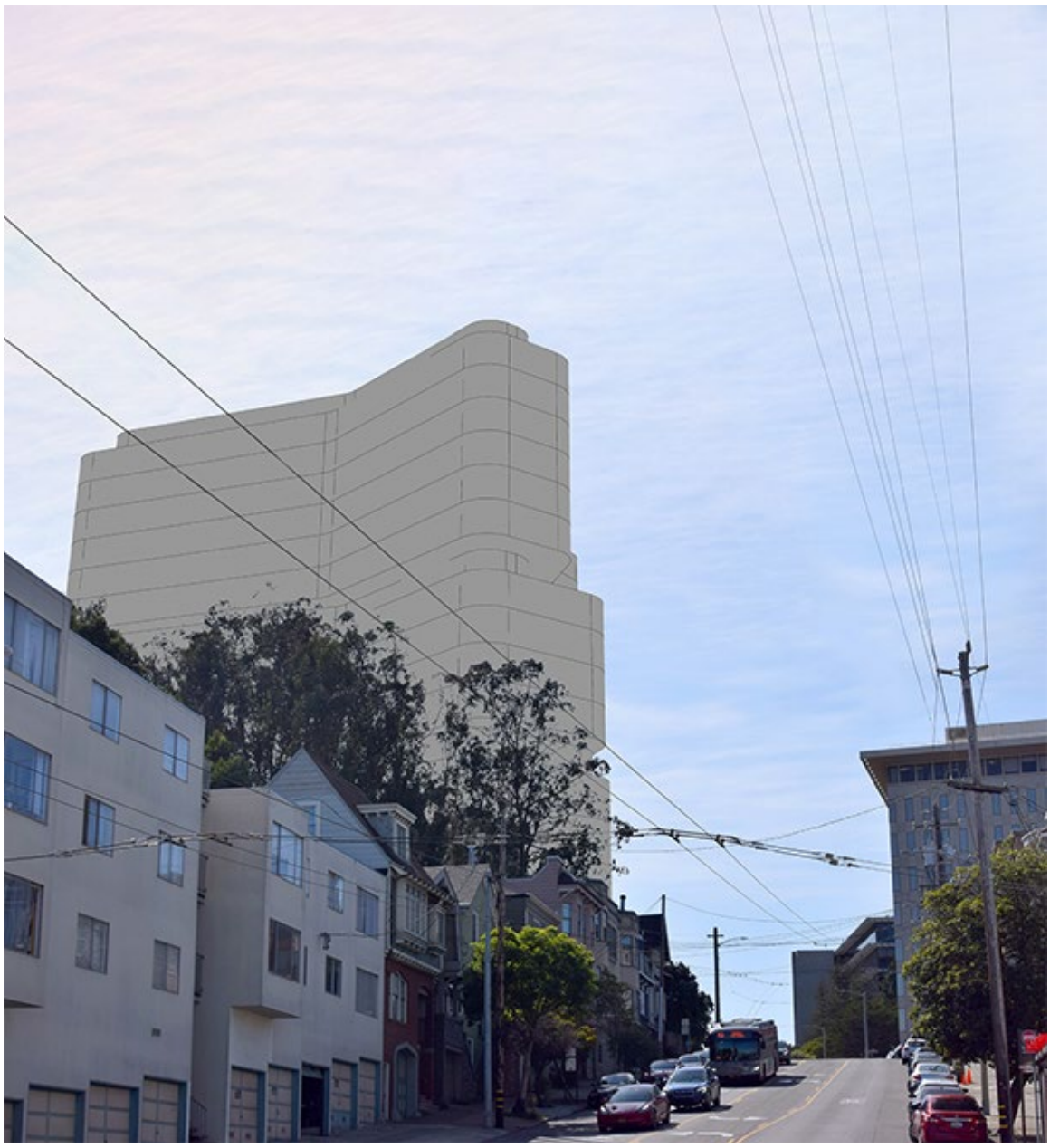
SOURCE: Prevision Design, 2019 UCSF Comprehensive Parnassus Heights Plan

Figure 6-4
Viewpoint 7: Visual Simulation of the Parnassus Heights Campus Site with CPHP including New Hospital - 19-Story Option from 3rd Avenue and Parnassus Avenue, Looking East

With respect to sensitivity to the surrounding landscape as set forth in 2014 LRDP sub-objective 1C, with its smaller hospital footprint, the New Hospital under this alternative would avoid potential encroachment into the Reserve that could occur under the CPHP, although the widening of the Medical Center Way under this alternative would still encroach into the hillside in the Reserve to the east. Similar to the CPHP, UCSF would replace any area of the Reserve lost due to new development under this alternative by designating a new area elsewhere on the campus site as Reserve in an amount equal to or greater than the area lost. As under the CPHP, the existing grove of redwood trees adjacent to UC Hall would be removed.

Similar to the CPHP, UCSF would also provide publically accessible open space within the campus core, including an expanded Promenade and Saunders Court, which would serve to minimize effects of loss of existing landscaping elsewhere under this alternative.

With respect to concerns about noise generation under this sub-objective, as mitigated, new buildings developed under the alternative would result in a less-than-significant effect on ambient noise levels pursuant to applicable noise standards, similar to the CPHP.



SOURCE: Prevision Design, 2019 UCSF Comprehensive Parnassus Heights Plan

Figure 6-5
Viewpoint 8: Visual Simulation of the CPHP including New Hospital - 19-Story Option from Parnassus Avenue and Willard Street, Looking West



SOURCE: Prevision Design, 2019 UCSF Comprehensive Parnassus Heights Plan

Figure 6-6
Viewpoint 9: Visual Simulation of CPHP including New Hospital - 19-Story Option from 17th Street and Clayton Street, Looking West



SOURCE: Prevision Design, 2019 UCSF Comprehensive Parnassus Heights Plan

Figure 6-7
Viewpoint 10: Visual Simulation of the CPHP including New Hospital - 19-Story Option From Willard Street and Belmont Avenue, looking West

2014 LRDP Sub-objective 1D. Similar to the CPHP, proposed new buildings along Parnassus Avenue under this alternative would be constructed concurrent with the proposed Parnassus Avenue Streetscape Plan. The Streetscape Plan improvements would serve to enhance the public realm as called for in UCSF's Physical Design Framework, and would be consistent with 2014 LRDP sub-objective 1D.

In summary, as under the CPHP, to the extent this alternative would be inconsistent with applicable 2014 LRDP objectives as described above, UCSF would seek amendments to the 2014 LRDP to bring this alternative and 2014 LRDP into conformity. Therefore, because this alternative would include provisions regarding scenic quality that would apply broadly to the alternative based on UCSF's Physical Design Framework, and because with amendments to the 2014 LRDP, this alternative would not conflict with the 2014 LRDP objectives related to scenic quality, and the impact would be less than significant, similar to the impact with the CPHP.

Due to its overall similarity, this alternative would also have a comparable impact related to new sources of light and glare when compared to the CPHP, and the impact would be similarly less-than-significant with mitigation.

Wind

Under this alternative, the New Hospital would be taller than under the CPHP; however, because it would occupy a smaller footprint than the proposed New Hospital, and because there would be more unbuilt area between the New Hospital and the steep slope to the east, across Medical Center Way, the 19-story option could result in incrementally lower wind speeds near the northeast corner of the New Hospital, when compared to those under the CPHP. In general, a moderate increase in height—such as the additional three stories considered here—is unlikely, in and of itself, to substantially increase pedestrian-level wind speeds beyond the increase that would occur with the New Hospital under the CPHP. Nevertheless, the New Hospital under this alternative would represent a substantial increase in building height and bulk compared to existing conditions, and could result in exceedances of the City's pedestrian wind hazard criterion along Parnassus Avenue, similar to what would be anticipated under the CPHP. This would be a significant effect, as would occur with the proposed CPHP and with the remainder of the development assumed under this alternative to be the same as under the CPHP, this alternative could—like the CPHP—result in exceedances of the wind hazard criterion adjacent to the RAB (both on the north and south sides of the building), the Irving Street Arrival, and the taller new Aldea Housing buildings, also resulting in a significant effect. Implementation of CPHP Mitigation Measure AES-4 (Design new buildings to minimize wind impacts at pedestrian level) would reduce the severity of the potentially significant wind impact. However, as under the CPHP, it cannot be stated with certainty that no wind hazard exceedances would result from this alternative, and therefore this impact could be significant even with mitigation under the New Hospital 19-Story Option.

Shadows

Under this alternative, the New Hospital would occupy a smaller footprint, but would contain an additional three floors and would be 47 feet taller than the New Hospital proposed under the CPHP. Shadow cast by the New Hospital under this alternative would affect the same open spaces

as shadow cast under the CPHP. These include three City parks (Golden Gate Park, Richard Gamble Memorial Park, and Grattan Playground) and two schoolyards that participate in the Shared Schoolyard Project and provide public access on weekends (Independence High School and Grattan Elementary School). Shading impacts under this alternative were quantified for Golden Gate Park, Richard Gamble Memorial Park, and Grattan Playground.

Under this alternative, the date of maximum shading at Golden Gate Park would be December 20, the same as under the CPHP. On this date, shadow from this alternative would cover both baseball fields near the southeast corner of the park early in the morning, but would recede from the park entirely by 10:00 a.m. Shadow from this alternative would reach parts of Golden Gate Park between early October and early March, compared to the CPHP, which would result in new shading at Golden Gate Park between mid-October and late February. Compared to the CPHP, shadow on the date of maximum shading as a result of this alternative would have more impact to Golden Gate Park than under the CPHP.

Shading on the Richard Gamble Memorial Park under this alternative would occur in winter between the same time periods as under the CPHP: late January to late February, and again from mid-October to mid-November. However, the total amount of annual shading would be substantially more in terms of square-foot hours; this alternative would cast approximately 12,800 square-foot hours of shading compared to approximately 800 square-foot hours of shading under the CPHP on this park.

Shading from this alternative would affect the Grattan Playground during the same time periods as the CPHP: from early April to early September. However, the total amount of annual shading would be substantially greater in terms of square-foot hours; this alternative would cast approximately 1,294,500 square-foot hours of shading compared to approximately 716,700 square-foot hours of shading under the CPHP on this park.

Overall, this alternative would result in more shadow on these open spaces than under the CPHP, however, similar to the CPHP, shadow from this alternative would reach these spaces during the time of day when usage is expected to be lowest. Thus, implementation of this alternative would not be expected to adversely or substantially affect the use and enjoyment of these open spaces, and this impact would be similarly less than significant on a project-level and cumulative basis.

Air Quality

This alternative would have a comparable amount of new construction and demolition activities as that proposed under the CPHP, with the exception being potentially less intrusion into and excavation of the hillside east of the New Hospital given its smaller building footprint Consequently, this alternative would generate similar or slightly reduced air pollutant emissions than the proposed CPHP resulting in a similar significant but mitigable impact associated with construction and demolition emissions of criteria pollutants and toxic air contaminants (TACs) and associated health risks at sensitive receptors. Mitigation would include the use of clean construction equipment and implementation of BAAQMD dust control measures.

This alternative would have the same increase in development and associated population and traffic increases compared to the CPHP. As a result, this alternative would result in the same air pollutant emissions from operations as the proposed CPHP, resulting in a similar significant and unavoidable project and cumulative impact related to net increases of operational criteria pollutants that would occur under the CPHP. Mitigation in the form of project-level operational measures and TDM enhancement measure would reduce this significant impact, but not to a level of less than significant. This alternative would also have a similar significant but mitigable impact as the CPHP associated with exposure of sensitive receptors to substantial project and cumulative operational pollutant concentrations. Lastly, this alternative would have a similar significant but mitigable impact as the CPHP associated with a conflict with or obstruction of implementation of the applicable *Clean Air Plan*.

Biological Resources

This alternative would have similar new construction and demolition activities as the CPHP, although it would avoid potential intrusion into the Reserve from the New Hospital that may occur under the CPHP. As a result, overall extent of construction and development-related impacts to biological resources under this alternative would be similar to or slightly less than that associated with the CPHP. Significant project and/or cumulative construction-related effects on special-status plant and wildlife species of this alternative would be mitigated to less-than-significant with applicable survey and resource project measures similar to the proposed CPHP; significant project and/or cumulative impacts associated with potential resident and migrating bird strikes from new development would be similarly mitigated to less-than-significant with implementation of bird safe building treatment measures; and this alternative would have a similar less than significant effect related to damage to or removal of landmark trees.

Cultural Resources

Since the New Hospital would not intrude into the Reserve, this alternative could have less impact to this historical cultural landscape than under the CPHP. Otherwise, this alternative would result in similar demolition and physical alteration of other existing and/or potential future historical resources compared to the CPHP. As a result, this alternative could have slightly less significant and unavoidable impacts to existing known historical resources than the CPHP, but similar impacts to potential future historical resources.

This alternative could also result in slightly less ground disturbing construction activities compared to the CPHP, as it would involve less potential intrusion into and excavation of the hillside east of the New Hospital. Potentially significant project and cumulative impacts to previously unknown archaeological resources, human remains, and/or tribal cultural resources under this alternative would be similarly mitigated to a less than significant level.

Energy

This alternative would result in similar construction and demolition activities compared to the CPHP, with an exception being potentially less intrusion into and excavation of the hillside east of the New Hospital, and as a result, could have a similar or slightly less construction energy use impact compared to the CPHP. This alternative would have a similar amount of development and

associated population increases compared to that associated with the CPHP, and consequently, would result in similar level of operational energy use. As such, the alternative would have similar less than significant project and/or cumulative impacts associated with consumption of energy resources as the CPHP; and would have a similar less than significant conflict with a state or local plan for renewable energy or energy efficiency.

Geology and Soils

This alternative would result in similar ground disturbing construction activities and new building construction as the CPHP, with an exception being potentially less intrusion into and excavation of the hillside east of the New Hospital. Accordingly, this alternative could have similar to or slightly less potential project and/or cumulative impacts than the CPHP as it relates to effects of seismic ground shaking, liquefaction or unstable soils, landslides, and erosion from ground disturbance during construction, and those effects would be similarly less than significant with compliance with applicable regulatory requirements and the implementation of geotechnical design recommendations and/or mitigation.

Greenhouse Gas Emissions

This alternative would result in similar new construction or demolition activities compared to the CPHP, with an exception being potentially less intrusion into and excavation of the hillside east of the New Hospital. As a result, this alternative would result in similar GHG emissions from construction as the CPHP, and would have similar or slightly less significant but mitigable project and/or cumulative construction-related effects greenhouse gas emissions. This alternative would also result in a similar amount of development and associated population and traffic increases at the Parnassus Heights campus site compared to the CPHP, and consequently, operational GHG emissions would be similar to the CPHP. Consequently, this alternative would have a similar significant but mitigable impact related to operational GHG emissions. Also, similar to the CPHP, this alternative would not conflict with applicable plans, policies or regulations adopted for the purpose of reducing the GHG emissions.

Hazards and Hazardous Materials

This alternative would result in similar new construction or demolition activities as the CPHP, with an exception being potentially less intrusion into and excavation of the hillside east of the New Hospital. This alternative would also result in a similar increase in operational development as the CPHP, and is therefore likely to result in similar increases in hazardous materials use as with the CPHP. Significant project and/or cumulative impacts associated with routine transport, use, or disposal of hazardous materials under this alternative would be similarly mitigated to a less than significant level with compliance with applicable, federal and State laws and regulations regulating transportation, management, and disposal of hazardous materials and wastes. The same would be true for project and/or cumulative impacts associated with potential accidental release of hazardous materials; and emitting and handling of hazardous materials within one-quarter mile of an existing or proposed school.

Hydrology and Water Quality

This alternative would result in similar new construction and groundbreaking activities as the CPHP, with an exception being potentially less intrusion into and excavation of the hillside east of the New Hospital. Also, with a smaller New Hospital building footprint, there would be an incrementally smaller increase in new impervious surfaces at the campus site under this alternative when compared to the CPHP. Nonetheless, similar to the proposed CPHP, compliance with the construction BMPs required by the NPDES Construction General Permit and operational design measures and LID stormwater requirements controls of the Phase II MS4 permit would ensure that project and/or cumulative impacts would be less than significant, including impacts related to the potential to violate water quality discharges requirements; degradation surface or groundwater quality; erosion and siltation; effect on flooding; effect on the capacity of stormwater drainage systems; additional sources of polluted runoff; or impedance or redirection of storm flows.

Land Use and Planning

This alternative would result in substantially the same amount of new development when compared to the CPHP, although it could result in less potential intrusion into the adjacent Reserve. This alternative would require similar amendments to the 2014 LRDP as are proposed under the CPHP that would affect the organization of land uses (with the exception of extent of area of the Reserve redesignated), the space program, and population. As a result, this alternative would have similar to or slightly less project and/or cumulative impacts than the CPHP at the Parnassus Heights campus site associated with conflict with land use plans, policies and regulations adopted for the purpose of avoiding or mitigating an environmental effect, and incompatibility with adjacent land uses, and these effects would be less than significant, as with the proposed CPHP.

Noise and Vibration

This alternative would have a comparable amount of new construction and demolition activities as that proposed under the CPHP, with the exception being potentially less intrusion into and excavation of the hillside east of the New Hospital given its smaller building footprint. As a result, project and cumulative construction-generated noise effects under this alternative would similarly be significant and unavoidable, even with implementation of construction noise control measures, limits on construction hours, and pile installation noise-reducing techniques. Construction vibration impacts under this alternative would be significant but mitigable with implementation of vibration control measures, as under the CPHP.

This alternative would result in similar amount of traffic as the CPHP, and consequently, transportation noise generated under this alternative would be similar to that under the CPHP. The significant project and/or cumulative impacts related to permanent increases in ambient noise levels from stationary noise sources in excess of applicable noise standards would be similarly mitigated under this alternative to a less than significant level with implementation of operational noise control measures, and the project and/or cumulative impacts associated with increases in traffic noise levels of this alternative would be similarly less than significant with the aforementioned mitigation measures.

Population and Housing

This alternative would result in a similar increase in the existing population at the Parnassus Heights campus site compared to the CPHP, and would demolish the same amount of existing housing, and develop the same amount of new housing at the campus site. As a result, this alternative would have similar less than significant project and/or cumulative impacts associated with inducement of population growth, and related new demand for housing, compared to the CPHP.

Public Services

This alternative would result in similar increases in development and population at the Parnassus Heights campus site compared to the CPHP. Consequently, this alternative would have similar less than significant project and/or cumulative impacts associated with the need for new or altered fire protection or public school facilities, as with the CPHP.

Recreation

This alternative would result in similar amount of new development and the same increase in population at the Parnassus Heights campus site as the CPHP. This alternative also proposes the same recreational improvements proposed under the CPHP, including the Millberry Terrace, expanded Saunders Court and Promenade. Consequently, this alternative would have similar less than significant project and/or cumulative impacts from the increase in the use of existing neighborhood and regional parks or other existing on- and off-campus recreational facilities, and from the construction of new recreational facilities.

Transportation

This alternative would have a comparable amount of new construction and demolition activities as that proposed under the CPHP, with the exception being potentially less intrusion into and excavation of the hillside east of the New Hospital given its smaller building footprint. Consequently, the significant construction impact to travel conditions along sidewalks and roadways serving the campus site under this alternative would be similarly mitigated to a less than significant level with implementation of construction coordination and monitoring measures.

This alternative would result in a similar amount of new development and the same increase in population and associated traffic at the Parnassus Heights campus site as the CPHP. This alternative would also provide the same transportation improvements for vehicles, bicycles and pedestrians proposed under the CPHP to improve circulation and safety at the campus site, including the Fourth Street extension, the pedestrian overcrossing and tunnel for Parnassus Avenue, widening of Medical Center Way, service corridor, Irving Street Arrival, and Promenade. As a result, this alternative would have similar less than significant project and/or cumulative impacts related to conflicts with programs, plans, ordinances or policies addressing the circulation system; increases in VMT; increases in hazard due to design features; and emergency access.

Utilities and Service Systems

This alternative would result in a similar amount of new development and the same increase in population, and associated increases in public utility demands at the Parnassus Heights campus site, as to the CPHP. Consequently, project and/or cumulative impacts under this alternative would be similarly less-than-significant as that identified for the CPHP, including impacts related to: construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities; effects on water supply availability during normal, dry and multiple dry years; effects on wastewater treatment capacity; effects on capacity of local solid waste infrastructure, and compliance with federal, and state and local statutes and regulations related to solid waste.

Relationship of CPHP including New Hospital - 19-Story Option to Meeting Project Objectives

While the New Hospital under this alternative would be approximately the same square footage and have the same bed capacity as that proposed under the CPHP, the irregularly-shaped footprint for New Hospital would result in inefficient floor plates for patient rooms, surgery suites, diagnostics and testing, labs and other hospital functions. Consequently, this New Hospital design would have more operational inefficiencies compared to the design under the CPHP. Accordingly, the New Hospital design under this alternative would not fully meet the CPHP project objectives for the New Hospital. UCSF also acknowledges the greater visibility and visual impact created by the taller hospital design under this alternative compared to the 16-story New Hospital under the proposed CPHP.

In all other aspects, the development program at the campus site under this alternative would be identical to that proposed under the CPHP. Accordingly, this alternative would meet the CPHP project objectives, for space, urban design and mobility; as well as for the Irving Street Arrival RAB, and Aldea Housing Densification.

6.3.5 Alternative 4: CPHP including New Hospital - Phased Option

This alternative is identical to the proposed CPHP, with the exception of the design and phasing of the New Hospital. This alternative would develop the New Hospital in two phases, on the site of LPPI and Moffitt Hospital. Phase 1 would involve demolition of the LPPI building, and the new construction of a hospital of about 252 beds in about 585,000 gsf in a 13-story building (four-story podium plus nine-story tower). Phase 2 would involve demolition of Moffitt Hospital and the new construction of an adjoining hospital of about 132 beds in about 370,000 gsf in a 10-story building (four-story podium plus six-story tower); please see **Figure 6-8**. The New Hospital under this alternative would contain one basement floor (one less than that proposed by the New Hospital under the CPHP). In total under this alternative, the New Hospital would be approximately the same square footage (955,000 gsf) and have the same bed capacity (384 beds) as the New Hospital proposed under the CPHP.

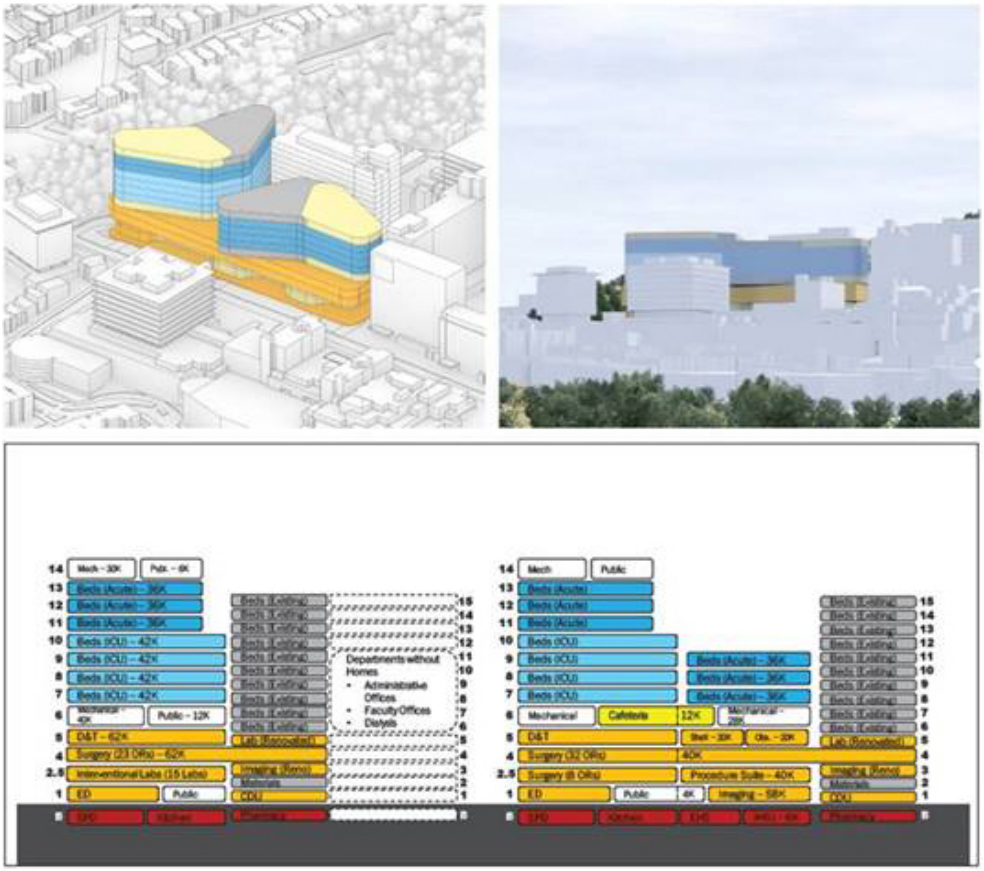


Figure 6-8
Alternative 4: CPHP including New Hospital - Phased Option

The New Hospital under this alternative would not extend into the adjacent Reserve, although the proposed widening of Medical Center Way would still be necessary and may encroach into the Reserve. As under the CPHP, the New Hospital under this alternative would have a connecting pedestrian bridge across Parnassus Avenue and a tunnel beneath Parnassus Avenue.

This alternative assumes the same revisions to the 2014 LRDP that were proposed in conjunction with the CPHP would occur under this alternative, including revisions to campus site functional zones (with the exception being modifications to the Open Space Reserve boundary would be related to the widening of Medical Center Way only), revisions to the space program, update to the estimated population, revisions to the Regents' Resolution, and update to the UCSF Greenhouse Gas Reduction Strategy.

It is assumed that UCSF would continue implementation of its existing plans and programs at Parnassus Heights not associated with the 2014 LRDP and/or CPHP, including, but not limited to, the *Mount Sutro Open Space Reserve Vegetation Management Plan*, and on-going campus site maintenance programs and activities.

Comparison of Effects of CPHP including New Hospital - Phased Option to the Proposed CPHP

Aesthetics, Wind and Shadow

Aesthetics

All development proposed at the Parnassus Heights campus site under this alternative would be identical to that proposed under the CPHP, with the exception of the New Hospital, which would occupy a broader footprint and require demolition of both LPPI and Moffitt Hospital, and would be three floors shorter than the New Hospital proposed under the CPHP. In addition, because of phasing, the full buildout of this New Hospital would not be complete and visible until approximately 2050.

Scenic Vistas

From the viewpoint at Grandview Park, the New Hospital under this alternative would rise lower on the skyline although it would be incrementally more broad, when compared to the New Hospital proposed under the CPHP, and would similarly only slightly obstruct the existing view of downtown San Francisco from this perspective, and would not obstruct scenic views from this park in other directions. Consequently, as with the CPHP, this alternative would not result in a substantial adverse impact on scenic vistas from this viewpoint.

When considering available vantage points from within the Reserve, such as from the Historic Trail, given its lower height, the New Hospital under this alternative would incrementally obstruct less of the northward scenic views across the campus core. However, as with the conclusion reached for the CPHP, given the overall lack of long-range scenic views from within the Reserve, implementation of the alternative would similarly not adversely affect scenic vistas from within the Reserve.

When considering the above, and additionally the new scenic views and new publicly-accessible open space that would be created from the campus site by this alternative (e.g., by the Millberry Terrace, expanded Saunders Court and the Promenade)– similar to the CPHP – the impact on scenic vistas from this alternative would be less than significant.

Scenic Quality

As under the CPHP, this alternative would have an adverse effect related to scenic quality if it were to conflict with UCSF 2014 LRDP policies governing scenic quality.

2014 LRDP Sub-objective 1B. Under this alternative, the 10- to 13-story New Hospital would be visibly shorter from off-site vantage points than the New Hospital proposed under the CPHP. However, New Hospital under this alternative would also appear more broad along Parnassus Avenue than the New Hospital proposed under the CPHP, as it would additionally occupy the footprint of Moffitt Hospital. While shorter than the New Hospital under the CPHP, the New Hospital under this alternative may slightly exceed the height limits of the City's 220-F height districts, and would exceed the City's 65-D height limit. Elsewhere on the campus site, exceedances of City height districts by other development proposed under this alternative (e.g., Millberry Union, Aldea Housing structures) would be identical to the proposed CPHP.

2014 LRDP Sub-objective 1C. Similar to the CPHP, implementation of the development program of this alternative would result in a substantial increase in development, and associated increase in the scale and density, on the campus site. Given its shorter height and mass, the New Hospital under this alternative would contrast less sharply both in height and scale with the existing residential development to the east than the New Hospital proposed under the CPHP. The proposed New Hospital under this alternative would also be closer in height to the nearby tallest existing buildings on the campus site compared to the New Hospital under the CPHP. The New Hospital could also appear less prominent in the viewsheds from nearby neighborhoods, such as those along Parnassus Avenue, 17th Street, and Willard Street at Belmont Avenue, compared to the New Hospital under the CPHP. Because of the reduced New Hospital height, development proposed under this alternative, would, on balance, be more consistent with 2014 LRDP sub-objective 1C in terms of height and scale when compared to the CPHP.

With respect to sensitivity to the surrounding landscape as set forth in 2014 LRDP sub-objective 1C, with its different hospital footprint, the New Hospital under this alternative would avoid potential encroachment into the Reserve that could occur for the New Hospital under the CPHP, although the widening of the Medical Center Way under this alternative would still encroach into the hillside in the Reserve to the east. Similar to the CPHP, UCSF would replace any area of the Reserve lost due to new development under this alternative by designating a new area elsewhere on the campus site as Reserve in an amount equal to or greater than that area lost. As under the CPHP, the existing grove of redwood trees adjacent to UC Hall would be removed.

Similar to the CPHP, UCSF would also provide publically accessible open space within the campus core, including an expanded Promenade and Saunders Court, which would serve to minimize effects of loss of existing landscaping elsewhere under this alternative.

With respect to the extent this sub-objective concerns noise generation, as mitigated, new buildings developed under the alternative would result in a less-than-significant effect on ambient noise levels pursuant to applicable noise standards, similar to under the CPHP.

2014 LRDP Sub-objective 1D. Similar to the CPHP, proposed new buildings along Parnassus Avenue under this alternative would be constructed concurrent with the proposed Parnassus Avenue Streetscape Plan. The Streetscape Plan improvements would serve to enhance the public realm as called for in UCSF's Physical Design Framework, and would be consistent with 2014 LRDP sub-objective 1D.

In summary, as under the CPHP, to the extent this alternative would be inconsistent with applicable 2014 LRDP objectives as described above, it is assumed UCSF would seek amendments to the 2014 LRDP to bring this alternative and 2014 LRDP into conformity. Therefore, because this alternative would include provisions regarding scenic quality that would apply broadly to the alternative based on UCSF's Physical Design Framework, with amendments to the 2014 LRDP, similar to the CPHP, this alternative would not conflict with the 2014 LRDP objectives related to scenic quality, and the impact would be less than significant.

This alternative would also have less impact related to new sources of light and glare compared to the CPHP given the shorter hospital height, and the overall impact would be similarly less-than-significant with mitigation.

Wind

Under this alternative, the New Hospital would be wider and shorter than the New Hospital proposed under the CPHP. The phased New Hospital would also create a longer street wall fronting Parnassus Avenue than the combination of the CPHP's New Hospital and the existing Moffitt Hospital, given that large portions of Moffitt Hospital's northern walls are set back from the street. Because the phased New Hospital would not encroach into the adjacent Reserve as would the project's New Hospital, the phased option could result in incrementally lower wind speeds near the northeast corner of the New Hospital, compared to those under the CPHP, because there would be more unbuilt area between the New Hospital and the steep slope to the east, across Medical Center Way. Moreover, the eastern portion of phased New Hospital would be three stories shorter than the New Hospital under the CPHP (and the western portion would be five stories shorter than the existing Moffitt Hospital). Nevertheless, the New Hospital under the phased alternative would still result in a substantial increase in building height and bulk at the east end of Parnassus Avenue on the campus site, compared to existing conditions, which could result in wind speeds that exceed the City's pedestrian wind hazard criterion along Parnassus Avenue—a significant effect, similar to what would be anticipated under the CPHP. With the remainder of development proposed under alternative the same as under the proposed CPHP, the New Hospital Phased Option could—like the CPHP—result in exceedances of the wind hazard criterion adjacent to the RAB (both on the north and south sides of the building), the Irving Street Arrival, and the taller new Aldea Housing buildings, also resulting in a significant effect. Implementation of CPHP Mitigation Measure AES-4 (Design new buildings to minimize wind impacts at pedestrian level) would reduce the severity of the potentially significant wind impact. However, as with the project, it cannot be stated with certainty that no wind hazard exceedances would result from the CPHP, and therefore this impact could be significant even with mitigation under the New Hospital Phased Alternative.

Shadows

Under this alternative, the New Hospital would occupy a broader footprint along Parnassus Avenue than the New Hospital under the CPHP because it would additionally require demolition of, and occupy the footprint of, Moffitt Hospital. The New Hospital under this alternative would also be three to six floors shorter than the New Hospital proposed under the CPHP. All other development at the campus site under this alternative would have building heights the same as that proposed under the CPHP. Shadow from this alternative would likely reach the three parks and two schoolyards receiving net new shadow cast under the CPHP, but because this alternative would result in a reduction in the overall height of the New Hospital, shadow effects from this alternative would have less impact than the CPHP. Overall, shadow under this alternative would affect publicly accessible open spaces, but not to an extent that would adversely or substantially impact the use and enjoyment of open spaces. Therefore, as under the CPHP, the overall shadow impact under this alternative would be similarly less than significant on a project-level and cumulative basis.

Air Quality

This alternative would have a comparable amount of new construction and demolition activities as that proposed under the CPHP, with the exceptions being potentially less intrusion into and excavation of the hillside east of the New Hospital, and the additional demolition of Moffitt Hospital, given its different building footprint. In addition, construction would occur over a longer time period, with Phase 2 of the New Hospital happening in the CPHP Future Phase. Consequently, this alternative could result in somewhat more construction-related air pollutant emissions, over a longer time period. This would likely result in a similar significant but mitigable impact associated with construction and demolition emissions of criteria pollutants of the CPHP, and toxic air contaminants (TACs) and associated health risks at sensitive receptors. Mitigation measures including use of clean construction equipment and implementation of BAAQMD dust control measures would mitigate those effects to less-than-significant, similar to with the CPHP.

This alternative would have the same increase in operational development and associated population and traffic increases compared to the CPHP. As a result, this alternative would have a similar significant and unavoidable project and cumulative impact related to net increases of operational criteria pollutants that would occur under the CPHP; with similar mitigation for project-level operational measures and TDM enhancement measure, albeit remaining significant and unavoidable. For the same reason, this alternative would also have similar significant but mitigable CPHP impact associated with exposure of sensitive receptors to substantial project and cumulative operational pollutant concentrations and similar mitigation to reduce DPM would mitigate those significant effects to less-than-significant. Lastly, this alternative would have a similar significant but mitigable impact associated with the CPHP's conflict with or obstruction of implementation of the applicable *Clean Air Plan*.

Biological Resources

This alternative would have similar new construction and demolition activities as the CPHP, with the exceptions being potentially less intrusion into and excavation of the hillside east of the New Hospital, and the additional demolition of Moffitt Hospital, given its different building footprint. Also, buildout of the New Hospital would occur over a longer time period, with Phase 2 of the New Hospital occurring in the CPHP Future Phase. As a result, the overall extent of construction and development-related impacts to biological resources under this alternative would be similar to or slightly less than that associated with the CPHP. Significant project and/or cumulative construction-related effects on special-status plant and wildlife species of this alternative would be mitigated to less-than-significant with applicable survey and resource project measures similar to the proposed CPHP; significant project and/or cumulative impacts associated with potential resident and migrating bird strikes from new development would be similarly mitigated to less-than-significant with implementation of bird safe building treatment measures; and this alternative would have a similar less than significant effect related to damage to or removal of landmark trees.

Cultural Resources

Since the New Hospital would not intrude into the Reserve under this alternative, it would have less impact to this historical cultural landscape than under the CPHP. Otherwise, this alternative would result in similar demolition and physical alteration of other existing and/or potential future historical resources compared to the CPHP. Moffitt Hospital is not considered eligible for the National Register or California Register. As a result, this alternative would slightly reduce but would not eliminate the significant and avoidable impacts related to the demolition/removal of historical resources under the CPHP.

This alternative would also result similar ground disturbing construction activities compared to the CPHP, although would involve potentially less intrusion into and excavation of the hillside east of the New Hospital, and would demolish Moffitt Hospital. Potentially significant project and cumulative impacts to previously unknown archaeological resources, human remains, and/or tribal cultural resources under this alternative would be similarly mitigated to a less than significant level.

Energy

This alternative would result in similar construction and demolition activities compared to the CPHP, with the exceptions being potentially less intrusion into and excavation of the hillside east of the New Hospital, and the additional demolition of Moffitt Hospital, given its different building footprint. Also, construction of the new hospital would occur over a longer time period, with Phase 2 of the New Hospital occurring in the CPHP Future Phase. As a result of its similar amount of overall development, this alternative would use a similar amount of energy for construction compared to the CPHP. For the same reason, this alternative would result in similar operational energy use than the CPHP. As such, the alternative would have a similarly less than significant project and/or cumulative impact associated with consumption of energy resources as the CPHP; and would have a similarly less than significant conflict with a state or local plan for renewable energy or energy efficiency.

Geology and Soils

This alternative would result in similar ground disturbing construction activities and new building construction compared to the CPHP, although would involve potentially less intrusion into and excavation of the hillside east of the New Hospital, and would demolish Moffitt Hospital. Accordingly, this alternative would have similar project and/or cumulative impacts than the CPHP as it relates to effects of seismic ground shaking, liquefaction or unstable soils, landslides, and erosion from ground disturbance during construction, and those effects would be similarly less than significant with compliance with applicable regulatory requirements and the implementation of geotechnical design recommendations and/or mitigation.

Greenhouse Gas Emissions

This alternative would result in similar new construction or demolition activities compared to the CPHP, with the exceptions being less potential intrusion into and excavation of the hillside east of the New Hospital, and the additional demolition of Moffitt Hospital, given its different building footprint. Also, construction of the New Hospital would occur over a longer time period,

with construction of Phase 2 of the New Hospital occurring in the CPHP Future Phase. Based on the similar amount of square footage as the CPHP, this alternative would have similar significant but mitigable project and/or cumulative construction-related greenhouse gas emissions at the Parnassus Heights campus site. For the same reason, this alternative would result in similar operational GHG emissions as the CPHP. Consequently, this alternative would have a similar significant but mitigable impact related to operational GHG emissions. Similar to the CPHP, this alternative would not conflict with applicable plans, policies or regulations adopted for the purpose of reducing the emissions of greenhouse gases.

Hazards and Hazardous Materials

This alternative would result in similar new construction or demolition activities compared to the CPHP, with the exceptions being potentially less intrusion into and excavation of the hillside east of the New Hospital, and the additional demolition of Moffitt Hospital, given its different building footprint. In addition, construction of the New Hospital would occur over a longer time period, with construction of Phase 2 of the New Hospital occurring in the CPHP Future Phase. With similar overall square footage, this alternative would result in a similar increase in operations, and the associated increases in hazardous materials use as under the CPHP. Significant project and/or cumulative impacts associated with routine transport, use, or disposal of hazardous materials under this alternative would be similarly mitigated to a less than significant level with compliance with applicable, federal and State laws and regulations covering transportation, management, and disposal of hazardous materials and wastes. In addition, project and/or cumulative impacts associated with potential accidental release of hazardous materials; and emitting and handling of hazardous materials within one-quarter mile of an existing or proposed school, for this alternative would be similarly less than significant as with the CPHP.

Hydrology and Water Quality

This alternative would result in similar new construction and groundbreaking activities compared to the CPHP, although would involve less potential intrusion into and excavation of the hillside east of the New Hospital, and would demolish Moffitt Hospital. Similar to with the proposed CPHP, compliance with the construction BMPs required by the NPDES Construction General Permit and operational design measures and LID stormwater requirements controls of the Phase II MS4 permit would ensure that project and/or cumulative impacts related to the potential to violate water quality discharges requirements; degradation surface or groundwater quality; erosion and siltation; effect on flooding; effect on the capacity of stormwater drainage systems; additional sources of polluted runoff; or impedance or redirection of storm flows, would be less than significant.

Land Use and Planning

This alternative would result in substantially same amount of new development compared to the CPHP, although would result in potentially less intrusion into the adjacent Reserve, and would demolish Moffitt Hospital. This alternative would require similar amendments to the 2014 LRDP that are proposed under the CPHP that would further affect land use (with the exception of extent of area of the Reserve redesignated), the space program, and population. As a result, this alternative would have similar project and/or cumulative CPHP impacts at the Parnassus Heights

campus site associated with conflict with land use plans, policies and regulations adopted for the purpose of avoiding or mitigating an environmental effect, and incompatibility with adjacent land uses, and these effects would similarly be less than significant.

Noise and Vibration

This alternative would have a comparable amount of new construction and demolition activities as that proposed under the CPHP, with the exceptions being potentially less intrusion into and excavation of the hillside east of the New Hospital, and the additional demolition of Moffitt Hospital, given its different building footprint. Also, construction of the New Hospital would occur over a longer time period, with construction of Phase 2 of the New Hospital occurring in the CPHP Future Phase. Overall, project and cumulative construction-generated noise effects under this alternative would be comparable to those under the CPHP and would similarly be significant and unavoidable, even with implementation of construction noise control measures, limits on construction hours, and pile installation noise-reducing techniques. Construction vibration impacts under this alternative would be significant but mitigable with implementation of vibration control measures, as under the CPHP.

This alternative would result in similar amount of traffic as the CPHP, and consequently, transportation noise generated by this alternative would be similar to that under the CPHP. The significant project and/or cumulative impact related to permanent increases in ambient noise levels from stationary noise sources in excess of applicable noise standards would be similarly mitigated under this alternative to a less than significant level with implementation of operational noise control measures, and the project and/or cumulative impact associated with increases in traffic noise levels of this alternative would be similarly less than significant with the aforementioned mitigation measures.

Population and Housing

This alternative would result in a similar increase in the existing population at the Parnassus Heights campus site compared to the CPHP, and would demolish the same amount of existing housing and develop the same increase in new housing at the campus site. As a result, this alternative would have similar less than significant project and/or cumulative impacts associated with inducement of population growth, and related new demand for housing, compared to the CPHP.

Public Services

This alternative would result in similar increase in development and population at the Parnassus Heights campus site compared to the CPHP. Consequently, this alternative would have similar less than significant project and/or cumulative impacts associated with need for new or altered fire protection or public school facilities, as with the CPHP.

Recreation

This alternative would result in similar amount of new development and increase in population at the Parnassus Heights campus site compared to the CPHP. This alternative also proposes the same recreational improvements proposed under the CPHP, including the Millberry Terrace,

expanded Saunders Court and Promenade. Consequently, this alternative would have similar less than significant project and/or cumulative impacts of increase in the use of existing neighborhood and regional parks or other existing on- and off-campus recreational facilities, and with the construction of new recreational facilities.

Transportation

This alternative would result in a similar amount of new construction at the Parnassus Heights campus site compared to the CPHP, with the exceptions being potentially less intrusion into and excavation of the hillside east of the New Hospital, and the demolition of Moffitt Hospital, given its different building footprint. Consequently, the significant construction impact to travel conditions along sidewalks and roadways serving the campus site under this alternative would be similarly mitigated to a less than significant level with implementation of construction coordination and monitoring measures.

This alternative would result in a similar amount of new development and increase in population and associated traffic at the Parnassus Heights campus site compared to the CPHP. This alternative would provide the same transportation improvements for vehicles, bicycles and pedestrians proposed under the CPHP to improve circulation and safety at the campus site, including the Fourth Street extension, the overcrossing and tunnel for Parnassus Avenue, widening of Medical Center Way, service corridor, Irving Street Arrival, and Promenade. This alternative would have similar less than significant project and/or cumulative impacts related to conflicts with programs, plans, ordinances or policies addressing the circulation system; increases in VMT; increases in hazard due to design features; and emergency access.

Utilities and Service Systems

This alternative would result in a similar amount of new development and increase in population, and associated increases in public utility demands at the Parnassus Heights campus site, compared to the CPHP. Consequently, project and/or cumulative impacts under this alternative would be similarly less-than-significant as that identified for the CPHP, including with: construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities; effects on water supply availability during normal, dry and multiple dry years; effects on wastewater treatment capacity; effects on capacity of local solid waste infrastructure, and compliance with federal, and state and local statutes and regulations related to solid waste.

Relationship of CPHP including New Hospital - Phased Option to Meeting Project Objectives

As discussed under the description of the New Hospital -- Phased Option, the New Hospital would be built in two phases, on the site of LPPI and Moffitt Hospital. Phase 1 would include 252 beds, and in conjunction with 291 beds at Long Hospital, would provide a total of 543 beds at the campus site in 2030. Phase 2 developed later would include 132 additional beds, and together with Phase 1 would provide the same total number of beds (384) and have the same buildings square footage as that proposed under the CPHP, and in conjunction with the beds at Long Hospital have the same total bed capacity (675 beds) at the campus site as proposed under the CPHP.

UCSF indicates that a minimum of 675 beds at Parnassus Heights campus site are necessary to address inpatient demand. This alternative would not provide sufficient number of beds until Phase 2, in the late 2030's or early 2040's. This alternative would also not supply an adequate number of operating rooms in the near-term, to address patient demand. Accordingly, this alternative would not fully meet the CPHP project objectives for the New Hospital.

In all other aspects, the development program at the campus site under this alternative would be similar to that proposed under the CPHP. Accordingly, this alternative would meet the CPHP project objectives, for space, urban design and mobility; as well as for the Irving Street Arrival RAB and Aldea Housing Densification.

6.4 Alternatives Considered but Dismissed from Further Evaluation

CEQA Guidelines Section 15126.6(c) requires an EIR to identify and briefly discuss any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process. In identifying alternatives for detailed evaluation, primary consideration was given to alternatives that could reduce significant impacts while still meeting most of the project objectives.

6.4.1 No New Hospital at Parnassus Heights Campus Site / Implement Phase 2 of Medical Center at Mission Bay Campus Site

This potential alternative would not develop the New Hospital proposed at the Parnassus Heights campus site under the CPHP. Rather, UCSF would continue to advance development of "Phase 2" of the Medical Center at the Mission Bay campus site. As previously analyzed in the 2008 *UCSF Medical Center at Mission Bay Final EIR*, Phase 2 of the Medical Center is a future phase of the Medical Center at Mission Bay, and would be developed within remaining acreage of Blocks 38-39 at that campus site. Phase 2 would consist of 793,500 gsf of new development, comprised of a 261-bed hospital, medical office space, hospital support, and parking. With no New Hospital developed at the Parnassus Heights campus site, this potential alternative assumes 291 beds would be provided at Long Hospital, and up to 100 beds would be available at Moffitt Hospital (following retrofitting and renovation of this building for inpatient beds), for a total of 391 beds.

As such, this potential alternative would result in an estimated 284 fewer overall beds at Parnassus Heights campus site, and hence at UCSF campus-wide, than under the proposed CPHP. As discussed in Chapter 3 *Project Description*, under Project Need, there are bed shortages for critical and acute care in San Francisco, the greater Bay Area, and beyond, particularly for the tertiary and quaternary level of care provided by UCSF. In addition, this potential alternative would not meet this growing demand, or allow for an expansion of emergency, surgical, interventional radiology, and imaging services, at this campus site. Also, given that the Parnassus Heights campus site is the hub for the five professional programs and the majority of adult clinical care, the absence of a New Hospital at the Parnassus Heights

campus site would not help to achieve the benefits that can be realized through interdisciplinary collaboration and convergence between clinical care, research and education.

As such, this potential alternative would conflict with several 2014 LRDP objectives for the Parnassus Heights campus site, including: "*(e)nsure that adequate space is provided to foster collaboration and to facilitate the inter-dependence and connectivity for operational efficiency and effectiveness of instruction, clinical, research and support uses in close physical proximity to each other;"* "*(e)nsure that Long Hospital and the New Hospital Addition have adequate clinical and administrative support and are aligned with education, research and specialized care programs and support that remain at the campus site*;" and conflict with a number of CPHP objectives, including: "*(r)evitalize the aging Parnassus Heights campus to enhance its place as a premier educational, research, and clinical institution…*;" "*(f)ulfill the need for contemporary research, educational, clinical, and support spaces …;"* and the CPHP's specific objectives for the New Hospital, including: "…*optimizes operational activities with other clinical facilities at Parnassus Heights*;" "*(i)ncrease inpatient beds at Parnassus Heights to address severe constraints on capacity and access to care, and to meet the needs of a growing and aging Bay Area population;" "(d)evelop spaces for clinical and translational research and learning in or adjacent to clinical areas where patients are located*;" and those objectives for meeting regulatory (including seismic) and modern industry standards, and patient satisfaction.

This potential alternative would reduce the significant wind impact identified in the vicinity of the New Hospital site at Parnassus Heights, would avoid demolition of the LPPI (individually eligible for listing in the National and California Registers), and avoid a number temporary construction and operational impacts associated with the New Hospital at the Parnassus Heights campus site that would occur under the proposed CPHP. However, by not developing a New Hospital at the Parnassus Heights campus site, and focusing future new clinical uses at the Mission Bay campus site, this potential alternative would also result in decreased efficiency for UCSF staff and students, and therefore have the potential to increase cross-town traffic between Parnassus Heights and Mission Bay campus sites, and related transportation effects and air emissions.

For these reasons, this potential alternative is not carried forward for detailed evaluation.

6.4.2 New Hospital on UC Hall Site

This potential alternative considers development of a New Hospital of similar size and capability as that proposed under the CPHP on the west side of campus core, at the site of UC Hall and a portion of the adjacent Dentistry Clinics Plaza. A similar-sized option was analyzed in the 2005 *UCSF 2005 LRDP Amendment #2 -Hospital Replacement Final EIR*, which assumed a new hospital of up to 400 beds, 800,000 gsf, and about 180 feet in height (11 stories)[3]. The New Hospital program proposed under the CPHP of 384 beds and about 955,000 gsf, if located on the UC Hall site on approximately the same footprint, would be approximately 14 to 15 stories, depending on massing.

[3] Excluding about 20 feet in height of rooftop mechanical equipment on the site of UC Hall.

Under the CPHP, the UC Hall site is planned for the proposed Research and Academic building. As such, the development of a New Hospital at the site of UC Hall under this alternative would displace research and academic uses envisioned to be developed at that site under the CPHP, and therefore, would necessitate relocation of those uses elsewhere on the campus site or possibly to a different campus site. As discussed in Chapter 3, *Project Description* under Project Need, UCSF research activities are an integral part of both the clinical and teaching missions of the University. Furthermore, existing research activities at Parnassus Heights currently operate in inadequate and outdated facilities which threaten researcher recruitment and retention. In addition, by dispersing the proposed groupings of land uses envisioned under the CPHP, this relocation scheme would diverge with a fundamental goal of the CPHP to consolidate clinical uses in the Clinical East End district, and research and academic uses within the Research and Academic Commons district. The development of New Hospital at a site physically distant from Moffitt and Long Hospitals under this alternative would not facilitate operational efficiency with these hospitals, including inpatient facilities, ambulatory care clinics, support, parking.

The development of a New Hospital at the site of UC Hall would also be constrained by the site size and access, making it difficult or impossible to meet the functional needs of a new hospital. Specifically, the insufficient site area would result in floor plate sizes that would be inadequate for the amount of space and functionality of space necessary for a contemporary hospital. In addition, the UC Hall site would be inadequate to accommodate proper vehicular circulation along Parnassus Avenue for ambulances, patient drop-off, and deliveries. Also, while vehicular traffic associated with a New Hospital at this site of UC Hall could be routed to the back of this site via Koret Way, such scheme would impact residents on 5th Avenue and Kirkham Street.

As such, this potential alternative would conflict with the 2014 LRDP objective for the Parnassus Heights campus site, including: "*(e)nsure that adequate space is provided to foster collaboration and to facilitate the inter-dependence and connectivity for operational efficiency and effectiveness of instruction, clinical, research and support uses in close physical proximity to each other;"* "*(e)nsure that Long Hospital and the New Hospital Addition have adequate clinical and administrative support and are aligned with education, research and specialized care programs and support that remain at the campus site*;" and conflict with a number of CPHP objectives, including "*(i)mprove the campus's functional organization…;"* "*(i)mprove campus circulation options to reduce impacts on the surrounding neighborhood*;" *"(s)ite and develop a new inpatient facility in a way that optimizes operational activities with other clinical facilities at Parnassus Heights…*;" "*(d)evelop a new inpatient facility that is optimized in its spatial layout to enhance functionality and efficiency*;" and "*(d)evelop spaces for clinical and translational research and learning in or adjacent to clinical areas where patients are located."*

While this potential alternative would reduce the significant wind impacts in the vicinity of the CPHP-proposed New Hospital location, it would also have the potential to introduce significant new wind impacts at the UC Hall site; and furthermore, would not avoid the identified significant operational air quality and historic resource impacts that would occur under the CPHP.

For these reasons, this potential alternative is not carried forward for detailed evaluation.

6.4.3 New Hospital at Mount Zion Campus Site

This potential alternative would construct a New Hospital at the UCSF Mount Zion campus site, as previously studied in the 2002 *UCSF Mount Zion Master Planning Study*, either on the main block site (bounded by Divisadero, Post, Scott and Sutter Streets) or on the south block (bounded by Divisadero, Geary, Scott, and Post Streets).

This potential alternative would result in UCSF hospitals operating at three different campus sites (Parnassus Heights, Mission Bay, and Mount Zion) which would be less than ideal and inefficient. Also, given that the Parnassus Heights campus site is the hub for the four professional schools and the majority of adult clinical care, the absence of a New Hospital at the Parnassus Heights campus site would not help to achieve the benefits that can be realized through interdisciplinary collaboration and convergence between clinical care, research and education. Lastly, UCSF does not own the Mount Zion south block sites, which are owned by many entities, making land acquisition difficult. This potential alternative would conflict with many of the same 2014 LRDP and CPHP objectives described under Section 6.4.1, above.

This potential alternative would reduce the significant wind impact identified in the vicinity of the New Hospital site at Parnassus Heights, avoid demolition of the LPPI (individually eligible for listing in the National and California Registers), and avoid a number temporary construction and operational impacts associated with the New Hospital at the Parnassus Heights campus site, although most of these impacts would simply be shifted to the UCSF Mount Zion campus site. This potential alternative would also result in decreased efficiency for UCSF staff and students, and therefore have the potential to increase traffic between Parnassus Heights, and other hospital campus sites, and related transportation effects and air emissions.

For these reasons, this potential alternative is not carried forward for detailed evaluation.

6.5 Summary Comparison of Alternatives

Table 6-3 provides a summary of comparison of impacts of the proposed CPHP and the CPHP Alternatives, and indicates whether the impacts of the CPHP Alternatives are more or less severe than those of the proposed CPHP. For more information about the methodology used to evaluate potential impacts of the CPHP and an explanation of the resulting impact conclusions, please see *Chapter 4 Environmental Setting, Impacts, and Mitigation Measures*.

TABLE 6-3
COMPARISON OF IMPACTS OF THE PROPOSED CPHP AND ALTERNATIVES

Impact	Proposed CPHP	No Project Alternative		Alternative 2: Reduced Project	Alternative 3: CPHP including New Hospital - 19-Story Option	Alternative 4: CPHP including New Hospital - Phased Option
		Alternative 1A: No Project - No Development	Alternative 1B: No Project - Development under 2014 LRDP			
4.1 Aesthetics, Wind, and Shadow						
Impact AES-1: Development under the CPHP would not have a substantial adverse effect on a scenic vista.	LTS	- LTS	- LTS	- LTS	=/+ LTS	- LTS
Impact AES-2: Development under the CPHP would occur in an urbanized area and would not conflict with applicable zoning and other regulations governing scenic quality.	LTS	- LTS	- LTS	- LTS	=/+ LTS	- LTS
Impact AES-3: Implementation of the CPHP would not create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area.	LTSM	- LTS	- LTSM	- LTSM	-/+ LTSM	- LTSM
Impact AES-4: Implementation of the CPHP would potentially create wind hazards in publicly accessible areas of substantial pedestrian use.	SUM	- LTS	- LTSM	- SUM	- SUM	- SUM
Impact AES-5: Implementation of the CPHP would not create new shadow in a manner that would substantially and adversely affects the use and enjoyment of publicly accessible open spaces.	LTS	- LTS	- LTS	- LTS	+ LTS	- LTS
Impact C-AES-1: Implementation of the CPHP, combined with cumulative projects, would not have a substantial adverse effect on a scenic vista or conflict with applicable zoning and other regulations governing scenic quality.	LTS	- LTS	- LTS	- LTS	-/+ LTS	- LTS
Impact C-AES-2: Implementation of the CPHP, combined with cumulative projects, would not create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area.	LTS	- LTS	- LTS	- LTS	-/+ LTS	- LTS
Impact C-AES-3: Implementation of the CPHP, combined with cumulative projects, would potentially create wind hazards in publicly accessible areas of substantial pedestrian use.	SUM	- LTS	- LTSM	- SUM	- SUM	- SUM
Impact C-AES-4: Implementation of the CPHP, combined with cumulative projects, would not create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces.	LTS	- LTS	- LTS	- LTS	+ LTS	- LTS

SUM Significant and Unavoidable with Mitigation
LTSM Less than Significant with Mitigation
LTS Less than Significant impact

\- Lesser impact than that of the proposed CPHP
= Same (or similar) impact as that of the proposed CPHP
-/= Less or similar impact to that of the proposed CPHP
-/+ Less or greater impact as the proposed CPHP
=/+ Similar or greater impact to that of the proposed CPHP

TABLE 6-3 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED CPHP AND ALTERNATIVES

Impact	Proposed CPHP	No Project Alternative		Alternative 2: Reduced Project	Alternative 3: CPHP including New Hospital - 19-Story Option	Alternative 4: CPHP including New Hospital - Phased Option
		Alternative 1A: No Project - No Development	Alternative 1B: No Project - Development under 2014 LRDP			
4.2 Air Quality						
Impact AIR-1: Construction of campus development under the CPHP would result in a cumulatively considerable net increase of a criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.	LTSM	- LTS	- LTSM	- LTSM	-/= LTSM	- LTSM
Impact AIR-2: Operation of campus facilities developed under the CPHP would result in a cumulatively considerable net increase of a criteria pollutant (PM_{10}) for which the project region is non-attainment under an applicable federal or state ambient air quality standard.	SUM	- LTS	- LTSM	- SUM	= SUM	=SUM
Impact AIR-3: Construction activities under the CPHP could expose sensitive receptors to substantial pollutant concentrations and exceed the LRDP EIR standard of significance by exposing receptors to toxic air contaminant emissions that (1) result in a cancer risk greater than 10 cancer cases per 1 million people exposed in a lifetime; or (2) for acute or chronic effects, result in concentrations of toxic air contaminant emissions with a Hazard Index of 1.0 or greater.	LTSM	- LTS	- LTS	- LTSM	-/= LTSM	-/+ LTSM
Impact AIR-4: Campus site operations under the CPHP could expose sensitive receptors to substantial pollutant concentrations and exceed the LRDP EIR standard of significance by exposing receptors to toxic air contaminant emissions that (1) result in a cancer risk greater than 10 cancer cases per 1 million people exposed in a lifetime; or (2) for acute or chronic effects, result in concentrations of toxic air contaminant emissions with a Hazard Index of 1.0 or greater.	LTSM	- LTS	- LTS	- LTSM	= LTSM	= LTSM
Impact AIR-5: The CPHP could conflict with or obstruct implementation of the *2017 Clean Air Plan*.	LTSM	- LTS	- LTS	- LTSM	= LTSM	= LTSM
Impact C-AIR-1**:** Implementation of the CPHP would result in a cumulatively considerable net increase of a criteria pollutant (PM_{10}) for which the project region is non-attainment under an applicable federal or state ambient air quality standard.	SUM	- LTS	-SUM	- SUM	= SUM	= SUM
Impact C-AIR-2: Implementation of the CPHP could contribute considerably to cumulative emissions of TACs and $PM_{2.5}$ that could expose sensitive receptors to substantial pollutant concentrations or health risks.	LTSM	- LTS	- LTS	- LTSM	-/= LTSM	-/+ LTSM

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LTS Less than Significant impact

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TABLE 6-3 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED CPHP AND ALTERNATIVES

Impact	Proposed CPHP	No Project Alternative		Alternative 2: Reduced Project	Alternative 3: CPHP including New Hospital - 19-Story Option	Alternative 4: CPHP including New Hospital - Phased Option
		Alternative 1A: No Project - No Development	Alternative 1B: No Project - Development under 2014 LRDP			
4.3 Biological Resources						
Impact BIO-1: Implementation of the CPHP would not have a substantial adverse effect, either directly or through habitat modifications, on species identified as candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.	LTSM	- LTS	-LTSM	- LTSM	-/= LTSM	- LTSM
Impact BIO-2: Implementation of the CPHP would not 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.	LTSM	- LTS	-LTSM	- LTSM	-/= LTSM	- LTSM
Impact BIO-3: Implementation of the CPHP would not conflict with any applicable local policies or ordinances protecting biological resources, including exceeding the LRDP EIR standard of significance by damaging or removing heritage or landmark trees or native oak trees of a diameter specified in a local ordinance.	LTS	- LTS	-LTS	- LTS	-/= LTS	- LTS
Impact C-BIO-1: Implementation of the CPHP would not result in cumulatively considerable impacts on biological resources, in combination with past, present and reasonably foreseeable future projects in the vicinity of the Parnassus Heights campus site.	LTSM	- LTS	-LTSM	- LTSM	-/= LTSM	- LTSM
4.4 Cultural Resources and Tribal Cultural Resources						
Impact CUL-1: Implementation of the CPHP would result in a substantial adverse change in the significance of known historical resources.	SUM	- LTS	-SUM	- SUM	- SUM	- SUM
Impact CUL-2: Implementation of the CPHP would result in a substantial adverse change in the significance of potential future historical resources that may become eligible by the full build-out of the CPHP in 2050.	SUM	- LTS	-LTS	- SUM	= SUM	= SUM
Impact CUL-3: Implementation of the CPHP could cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5.	LTSM	- LTS	-LTSM	- LTSM	-/= LTSM	-/+ LTSM
Impact CUL-4: Implementation of the CPHP could disturb human remains, including those interred outside of dedicated cemeteries.	LTSM	- LTS	-LTSM	- LTSM	-/= LTSM	-/+ LTSM

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TABLE 6-3 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED CPHP AND ALTERNATIVES

Impact	Proposed CPHP	No Project Alternative		Alternative 2: Reduced Project	Alternative 3: CPHP including New Hospital - 19-Story Option	Alternative 4: CPHP including New Hospital - Phased Option
		Alternative 1A: No Project - No Development	Alternative 1B: No Project - Development under 2014 LRDP			
4.4 Cultural Resources and Tribal Cultural Resources (cont.)						
Impact CUL-5: Implementation of the CPHP could cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe.	LTSM	- LTS	-LTSM	- LTSM	-/= LTSM	-/+ LTSM
Impact C-CUL-1: Implementation of the CPHP would result in cumulatively considerable impacts on cultural and/or tribal cultural resources, in combination with past, present and reasonably foreseeable future projects in the vicinity of the Parnassus Heights campus site.						
Historical Resources:	SUM	- LTS	-SUM	- SUM	- SUM	- SUM
Archaeological Resources, Human Remains, and Tribal Cultural Resources:	LTSM (	- LTS	-LTSM	- LTSM	-/= LTSM	-/+ LTSM
4.5 Energy						
Impact ENE-1: Implementation of the CPHP would not result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.	LTS	- LTS	- LTS	- LTS	-/= LTS	-/+ LTS
Impact ENE-2: Implementation of the CPHP would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	LTS	- LTS	- LTS	- LTS	-/= LTS	-/+ LTS
Impact C-ENE-1: The CPHP, combined with cumulative development in the Parnassus Heights campus site vicinity and citywide, would not result in significant cumulative energy impacts.	LTS	- LTS	-LTS	-LTS	-/= LTS	-/+ LTS
4.6 Geology and Soils						
Impact GEO-1: New development under the CPHP would not directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking.	LTS	- LTS	- LTS	- LTS	-/= LTS	-/+ LTS
Impact GEO-2: New development under the CPHP would not directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving strong seismic related ground failure including liquefaction.	LTS	- LTS	- LTS	- LTS	-/= LTS	-/+ LTS

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TABLE 6-3 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED CPHP AND ALTERNATIVES

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		Alternative 1A: No Project - No Development	Alternative 1B: No Project - Development under 2014 LRDP			
4.6 Geology and Soils (cont.)						
Impact GEO-3: New development under the CPHP would not directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving landslides.	LTSM	- LTS	- LTS	- LTSM	-/= LTSM	-/+ LTS
Impact GEO-4: Construction and operation of development associated with the CPHP would not have the potential to result in the substantial erosion or the loss of topsoil.	LTS	- LTS	-LTS	- LTS	-/= LTS	-/+ LTS
Impact GEO-5: Development and redevelopment associated with the CPHP would not 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.	LTS	- LTS	-LTS	- LTS	-/= LTS	-/+ LTS
Impact GEO-6: Construction associated with the CPHP could have the potential to directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	LTSM	- LTS	-LTS	- LTSM	-/= LTSM	-/+ LTSM
Impact C-GEO-1: Implementation of the CPHP could have the potential to combine with past, present and reasonably foreseeable future projects to result in cumulatively considerable impacts related to geology and soils.	LTSM	- LTS	-LTS	- LTSM	-/= LTSM	-/+ LTSM
4.7 Greenhouse Gas Emissions						
Impact GHG-1: Implementation of the CPHP would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.	LTSM	- LTS	- LTSM	- LTSM	-/= LTSM	-/+ LTSM
Impact GHG-2: Implementation of the CPHP would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	LTS	- LTS	-LTS	- LTS	-/= LTS	-/+ LTS
4.8 Hazards and Hazardous Materials						
Impact HAZ-1: Construction and operation of campus development under the proposed CPHP could create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	LTSM	- LTS	- LTSM	- LTSM	-/= LTSM	-/+ LTSM

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TABLE 6-3 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED CPHP AND ALTERNATIVES

Impact	Proposed CPHP	No Project Alternative		Alternative 2: Reduced Project	Alternative 3: CPHP including New Hospital - 19-Story Option	Alternative 4: CPHP including New Hospital - Phased Option
		Alternative 1A: No Project - No Development	Alternative 1B: No Project - Development under 2014 LRDP			
4.8 Hazards and Hazardous Materials (cont.)						
Impact HAZ-2: Construction and operation of campus development under the proposed CPHP would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	LTS	- LTS	- LTS	- LTS	-/= LTS	-/+ LTS
Impact HAZ-3: Construction and operation of the proposed CPHP would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	LTS	- LTS	- LTS	- LTS	-/= LTS	-/+ LTS
Impact HAZ-4: Campus development under the proposed CPHP would not be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. However, previously unknown contamination could be encountered during construction and could have the potential to create a significant hazard to the public or the environment.	LTSM	- LTS	- LTSM	- LTSM	-/= LTSM	-/+ LTSM
Impact C-HAZ-1: Construction and operation of campus development under the proposed CPHP, in conjunction with other cumulative development within the City of San Francisco, would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials or from risk of upset and accident conditions	LTS	- LTS	- LTS	- LTS	-/= LTS	-/+ LTS
4.9 Hydrology and Water Quality						
Impact HYD-1: Construction and operation of campus development under the CPHP would not have the potential to violate water quality standards or waste discharge requirements, or otherwise substantially degrade surface or groundwater quality.	LTS	- LTS	-LTS	- LTS	-/= LTS	-/+ LTS
Impact HYD-2: Construction and operation of the campus development under the CPHP would not substantially alter the existing drainage patterns of the site or area, in a manner that has the potential to result in substantial erosion or siltation on- or off-site; substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off site; create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or impede or redirect flow.	LTS	- LTS	- LTS	- LTS	-/= LTS	-/+ LTS

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TABLE 6-3 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED CPHP AND ALTERNATIVES

Impact	Proposed CPHP	No Project Alternative		Alternative 2: Reduced Project	Alternative 3: CPHP including New Hospital - 19-Story Option	Alternative 4: CPHP including New Hospital - Phased Option
		Alternative 1A: No Project - No Development	Alternative 1B: No Project - Development under 2014 LRDP			
4.9 Hydrology and Water Quality (cont.)						
Impact C-HYD-1: Construction and operation of campus development under the CPHP, in conjunction with other cumulative development within the City of San Francisco, would not cumulatively violate water quality standards or waste discharge requirements, or otherwise substantially degrade water quality.	LTS	- LTS	- LTS	- LTS	-/= LTS	-/+ LTS
Impact C-HYD-2: Construction and operation of campus development under the CPHP, in conjunction with other cumulative development in the City of San Francisco's CSS, would not have the potential to cumulatively alter the drainage pattern of the site or area, through the addition of impervious surfaces, in a manner which would result in substantial erosion or siltation on or off site; substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site; create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or impede or redirect flow.	LTS	- LTS	- LTS	- LTS	-/= LTS	-/+ LTS
4.10 Land Use and Planning						
Impact LU-1: Implementation of the CPHP would not cause a significant environmental impact due to a conflict with land use plans, policies and regulations adopted for the purpose of avoiding or mitigating an environmental effect.	LTS	- LTS	- LTS	- LTS	-/= LTS	- LTS
Impact LU-2: Development under the proposed CPHP would not conflict with local land use regulations such that a significant incompatibility with adjacent land uses is created.	LTS	- LTS	- LTS	- LTS	-/= LTS	- LTS
Impact C-LU-1: The proposed CPHP, in combination with past, present, and reasonably foreseeable future projects, would not result in a conflict with land use plans, policies, and regulations adopted for the purpose of avoiding or mitigating an environmental effect or a conflict with local land use regulations such that a significant incompatibility with adjacent land uses is created.	LTS	- LTS	- LTS	- LTS	-/= LTS	- LTS
4.11 Noise and Vibration						
Impact NOI-1: Construction activities under the CPHP would generate a substantial temporary increase in ambient noise levels in the vicinity of the construction project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	SUM	- LTS	SUM	- SUM	-/= SUM	-/+ SUM

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TABLE 6-3 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED CPHP AND ALTERNATIVES

Impact	Proposed CPHP	No Project Alternative		Alternative 2: Reduced Project	Alternative 3: CPHP including New Hospital - 19-Story Option	Alternative 4: CPHP including New Hospital - Phased Option
		Alternative 1A: No Project - No Development	Alternative 1B: No Project - Development under 2014 LRDP			
4.11 Noise and Vibration (cont.)						
Impact NOI-2: Implementation of the CPHP would generate substantial permanent increases in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	LTSM	- LTS	-LTSM	- LTSM	-/= LTSM	= LTSM
Impact NOI-3: Construction activities under the CPHP could result in generation of excessive groundborne vibration or groundborne noise levels.	LTSM	- LTS	-LTSM	- LTSM	-/= LTSM	-/+ LTSM
Impact NOI-4: Implementation of the CPHP would not exceed an LRDP EIR operational standard of significance by contributing to an increase in average daily noise levels (L_{dn}) of 3 dB(A) or more at property lines, where ambient noise levels already exceed local noise levels set forth in local general plans or ordinances for such areas based on their use.	LTS	- LTS	-LTS	- LTS	= LTS	= LTS
Impact C-NOI-1: Implementation of the CPHP, combined with cumulative construction noise in the project area, would generate a substantial temporary increase in ambient noise levels from construction activity in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	SUM	- LTS	SUM	- SUM	-/= SUM	-/+ SUM
Impact C-NOI-2: Implementation of the CPHP, combined with cumulative development in the project area, would generate substantial permanent increases in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	LTSM	- LTS	-LTSM	- LTSM	= LTSM	= LTSM
Impact C-NOI-3: Implementation of the CPHP, combined with cumulative construction in the project area, would result in generation of excessive groundborne vibration or groundborne noise levels.	LTSM	- LTS	-LTSM	- LTSM	-/= LTSM	-/+ LTSM
Impact C-NOI-4: Implementation of the CPHP combined with cumulative development in the project area could exceed an LRDP EIR operational standard of significance by contributing to an increase in average daily noise levels (L_{dn}) of 3 dB(A) or more at property lines, if ambient noise levels in areas adjacent to proposed development already exceed local noise levels set forth in local general plans or ordinances for such areas based on their use.	LTS	- LTS	-LTS	- LTS	= LTS	= LTS

SUM Significant and Unavoidable with Mitigation
LTSM Less than Significant with Mitigation
LTS Less than Significant impact

\- Lesser impact than that of the proposed CPHP
= Same (or similar) impact as that of the proposed CPHP
-/= Less or similar impact to that of the proposed CPHP
-/+ Less or greater impact as the proposed CPHP
=/+ Similar or greater impact to that of the proposed CPHP

TABLE 6-3 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED CPHP AND ALTERNATIVES

Impact	Proposed CPHP	No Project Alternative		Alternative 2: Reduced Project	Alternative 3: CPHP including New Hospital - 19-Story Option	Alternative 4: CPHP including New Hospital - Phased Option
		Alternative 1A: No Project - No Development	Alternative 1B: No Project - Development under 2014 LRDP			
4.12 Population and Housing						
Impact POP-1: Implementation of the CPHP would induce population growth in the San Francisco Bay area, which could create demand for housing outside the market area.	LTS	-- LTS	- LTS	- LTS	= LTS	= LTS
Impact POP-2: Implementation of the CPHP would not displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere	LTS	- LTS	- LTS	- LTS	= LTS	= LTS
Impact C-POP-1: The CPHP, in combination with past, present, and reasonably foreseeable future projects, would not result in a cumulatively considerable contribution to significant cumulative population and housing impacts.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS
4.13 Public Services						
Impact PUB-1: Implementation of the CPHP would not result in substantial adverse physical impacts associated with the provision of new or physically altered fire protection facilities, need for new or physically altered fire protection facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS
Impact PUB-2: Implementation of the CPHP would not result in substantial adverse physical impacts associated with the provision of new or physically altered public school facilities, need for new or physically altered public school facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS
Impact C-PUB-1: The CPHP, in combination with past, present, and reasonably foreseeable future projects, would not result in substantial adverse physical impacts associated with the provision of new or physically altered public facilities, need for new or physically altered public facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS

SUM Significant and Unavoidable with Mitigation
LTSM Less than Significant with Mitigation
LTS Less than Significant impact

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TABLE 6-3 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED CPHP AND ALTERNATIVES

Impact	Proposed CPHP	No Project Alternative		Alternative 2: Reduced Project	Alternative 3: CPHP including New Hospital - 19-Story Option	Alternative 4: CPHP including New Hospital - Phased Option
		Alternative 1A: No Project - No Development	Alternative 1B: No Project - Development under 2014 LRDP			
4.14 Recreation						
Impact REC-1: Implementation of the CPHP would not increase the use of existing neighborhood and regional parks or other existing on- and off-campus recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS
Impact REC-2: The CPHP includes new recreational facilities, the construction of which would not have an adverse impact on the environment with mitigation.	LTS	- LTS	-LTS	- LTS	= LTS	= LTS
Impact C-REC-1: The CPHP, in combination with past, present, and reasonably foreseeable future projects, would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS
4.15 Transportation and Traffic						
Impact TRANS-1: Implementation of the CPHP would not conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS
Impact TRANS-2: Implementation of the CPHP would not conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b).	LTS	- LTS	- LTS	- LTS	= LTS	= LTS
Impact TRANS-3: Implementation of the CPHP would not substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	LTS	- LTS	- LTS	- LTS	= LTS	= LTS
Impact TRANS-4: Implementation of the CPHP would not result in inadequate emergency access.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS
Impact TRANS-5: Construction activities under the CPHP could temporarily impact travel conditions along sidewalks and roadways serving the campus site.	LTSM	- LTS	- LTSM	- LTSM	-/= LTSM	= LTSM
Impact C-TRANS-1: The CPHP, in combination with past, present, and reasonably foreseeable future projects, would not result in a cumulatively considerable contribution to significant transportation impacts.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS

SUM Significant and Unavoidable with Mitigation
LTSM Less than Significant with Mitigation
LTS Less than Significant impact

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TABLE 6-3 (CONTINUED)
COMPARISON OF IMPACTS OF THE PROPOSED CPHP AND ALTERNATIVES

Impact	Proposed CPHP	No Project Alternative		Alternative 2: Reduced Project	Alternative 3: CPHP including New Hospital - 19-Story Option	Alternative 4: CPHP including New Hospital - Phased Option
		Alternative 1A: No Project - No Development	Alternative 1B: No Project - Development under 2014 LRDP			
4.16 Utilities and Service Systems						
Impact UTIL-1: Implementation of the proposed CPHP would require or result in the construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.	LTS	- LTS	- LTS	- LTS	= LTS	-/+ LTS
Impact UTIL-2: Sufficient water supply would be available from existing entitlements and resources to serve development under the proposed CPHP under normal, dry and multi-dry years if the Bay Delta Plan Amendment is implemented. If the Bay Delta Plan Amendment is implemented, the SFPUC may address the shortfalls through rationing and/or develop new or expanded water supply facilities to address shortfalls in single and multiple dry years. The CPHP would not make a considerable contribution to impacts from increased rationing or from the development of new supply sources.	LTS	- LTS	- LTS	- LTS	= LTS	- LTS
Impact UTIL-3: The wastewater treatment provider would have adequate wastewater treatment capacity to serve campus development under the proposed CPHP.	LTS	- LTS	- LTS	- LTS	= LTS	- LTS
Impact UTIL-4: Construction of campus development under the proposed CPHP would not generate solid waste in excess of State or local standards or the capacity of local infrastructure and would comply with federal, state and local statutes and regulations related to solid waste.	LTS	- LTS	- LTS	- LTS	= LTS	-/+ LTS
Impact UTIL-5: Operation of campus development under the proposed CPHP would not generate solid waste in excess of State or local standards or the capacity of local infrastructure and would comply with federal, State and local statutes and regulations related to solid waste.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS
Impact C-UTIL-1: Development under the proposed CPHP, in combination with past, present, and reasonably foreseeable future projects in the vicinity of the Parnassus Heights campus site, would not substantially contribute to cumulative impacts related to utilities and services systems.	LTS	- LTS	- LTS	- LTS	= LTS	= LTS

SOURCE: Environmental Science Associates

SUM Significant and Unavoidable with Mitigation
LTSM Less than Significant with Mitigation
LTS Less than Significant impact

\- Lesser impact than that of the proposed CPHP
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6.6 Environmentally Superior Alternative

Section 15126.6(e)(2) of the CEQA Guidelines requires the identification of an environmentally superior alternative to the proposed project. If the environmentally superior alternative is the "no project" alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives.

6.6.1 Alternative 1A: No Project - No Development Alternative

From the alternatives evaluated in this EIR, the environmentally superior alternative would be the No Project - No Development Alternative. The No Project - No Development Alternative would not involve new demolition and construction at the campus site related to remaining authorized demolition/construction projects not yet implemented under the 2014 LRDP; or associated with the proposed CPHP. Furthermore, under No Project - No Development Alternative, there would be no increase in authorized operational development at the campus site related to instructional, research, clinical, housing and support uses over existing conditions, and consequently, no increase in population. Since no New Hospital would be developed under this alternative, it would also avoid potential encroachment into the Reserve that could be associated with the New Hospital under the proposed CPHP.

As such, the No Project - No Development Alternative would have substantially less overall environmental impacts that either the proposed CPHP and/or the other alternatives. The No Project - No Development Alternative would eliminate the nine significant and unavoidable Project and/or cumulative CPHP impacts: Impacts AES-and C-AES-3 (project and cumulative wind hazards); Impacts AIR-2 and C-AIR-1 (project and cumulative increases in operational criteria air pollutants); Impact CUL-1 (effects on known historical resources), Impact CUL-2 (effects on potential future historical resources), and Impact C-CUL-1 (cumulative effects on historical resources); and Impact NOI-1 and C-NOI-1 (project and cumulative construction noise effects).

The No Project - No Development Alternative would also avoid 24 other significant but mitigable impacts that would occur under the CPHP, including impacts related to operational lighting, generation of construction emissions; exposure to construction- and operational-related toxic air contaminant emissions, conflict with the 2017 Clean Air Plan, potential impacts to special-status species during construction; potential for increased bird strikes from new building development; potential to disturb unknown archaeological and tribal resources, human remains and/or paleontological resources during construction excavation; landslides; generation of GHG emissions; potentially encountering naturally occurring asbestos or contaminated soils during construction excavation; construction vibration effects; and construction traffic effects.

However, as discussed above under Section 6.3.1, this alternative is impractical because it would not provide for implementation of any remaining but unbuilt authorized development under the 2014 LRDP, or for implementation of the development program proposed under the CPHP, or accommodate associated revisions to campus site functional zones, space program, estimated population, and update to the UCSF Greenhouse Gas Reduction Strategy. Consequently, this alternative would not achieve any of the CPHP objectives. As such, this alternative is considered

both unrealistic and infeasible. While comparatively more practical, Alternative 1B: No Project – Development under the 2014 LRDP would also not accomplish the CPHP objectives.

6.6.2 Reduced Project Alternative

Of the remaining alternatives that are not the no project alternative: (i.e., Reduced Project, CPHP including New Hospital - 19-Story Option, and CPHP including New Hospital - Phased Option), Alternative 2: the Reduced Project Alternative is considered the environmentally superior alternative. Among the three build alternatives, the Reduced Project Alternative would involve the least amount of demolition and construction; would involve the smallest increase in new campus site development and population over existing conditions; would include a shorter New Hospital (a reduction of 4 stories and about 82 feet) on a smaller footprint than that proposed under the CPHP; would provide historic preservation of five architecturally significant buildings on the campus site; and would avoid potential encroachment into the Reserve by the New Hospital.

While the Reduced Project Alternative would not fully avoid any of the nine significant and unavoidable impacts of the proposed CPHP (nor would the CPHP including New Hospital – 19-Story Option or CPHP including New Hospital - Phased Option alternatives), on balance, this alternative would serve to reduce the severity of the CPHP's environmental impacts more than the other two alternatives:

- With respect to wind, the smaller footprint and reduced height of the New Hospital under this alternative could result in incrementally lower wind speeds east of New Hospital and along Parnassus Avenue near the New Hospital. Retaining of UC Hall, the Dental Clinics building, and the School of Nursing building would reduce the potential for new wind hazards in the west side of the campus core.
- With respect to operational increases in criteria air pollutants, since this alternative would result in approximately 25 percent less increase in development, and less associated population and traffic increases, at the campus site compared to the CPHP, it would have less operational emissions of criteria pollutants than would occur under the CPHP.
- With respect to historical resources, since this alternative would provide historic preservation of five architecturally significant buildings on the campus site (UC Hall, Dental Clinics building; and Aldea San Miguel Housing Buildings 8, 10, and 12), it would avoid the significant and unavoidable impact to these historical resources that would occur under the CPHP; and because there would be no potential encroachment into the Reserve by the New Hospital (although the widening of Medical Center Way may still encroach), it would alter less of this historical cultural landscape than the CPHP.
- With respect to construction noise; with its smaller development program, this alternative would have less new construction and demolition activities as that proposed under the CPHP, and consequently less construction noise effects.

The Reduced Project Alternative would also serve to incrementally reduce the severity of 24 other significant but mitigable impacts that would occur under the CPHP, including impacts related to operational lighting, generation of construction emissions; exposure to construction- and operational-related toxic air contaminant emissions, conflict with the 2017 Clean Air Plan, potential

impacts to special-status species during construction; potential for increased bird strikes from new building development; potential to disturb unknown archaeological and/or tribal resources, human remains and paleontological resources during construction excavation; landslides; generation of GHG emissions; potentially encountering naturally occurring asbestos or contaminated soils during construction excavation; construction vibration effects; and construction traffic effects.

However, this alternative would fail to fully achieve certain Project objectives, and in particular, would not fully meet the CPHP project objectives, for space, urban design and mobility, or for the New Hospital, RAB or Aldea Housing Densification.

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CHAPTER 7
Report Preparation

7.1 Report Authors

7.1.1 Lead Agency

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Appendix A
Initial Study and Notice of Preparation

University of California
San Francisco

Campus Planning

Real Estate

UCSF Box 0286
654 Minnesota Street, 2nd Floor
San Francisco, CA 94143

tel: 415.476.2911

Alicia Murasaki
Assistant Vice Chancellor

Alicia.Murasaki@ucsf.edu
www.ucsf.edu

January 14, 2020

Notice of Preparation of Environmental Impact Report and Initial Study
Notice of a Public Scoping Meeting

Project:	UCSF Comprehensive Parnassus Heights Plan
Location:	UCSF Parnassus Heights campus site
Block/Lot:	2634A/011 & 005; 1849/054; 1850/001; 1758/043; 1757/035; 1756/001; 1275A/030
Sponsor:	University of California, San Francisco (UCSF)
Lead Agency:	The Regents of the University of California
Staff Contact:	Diane Wong, UCSF (415) 502-5952

This is the Notice of Preparation (NOP) of an Environmental Impact Report (EIR) and Initial Study for the above-named project. This document is available at http://campusplanning.ucsf.edu/ for a 31-day public review and comment period beginning **January 14, 2020 through February 14, 2020**.

Project Description

The University of California, San Francisco (UCSF) is proposing the Comprehensive Parnassus Heights Plan (CPHP), a conceptual, flexible plan to meet projected space needs for critical programs in research, patient care, and education at the UCSF Parnassus Heights campus site while improving upon the aesthetic and functional design of the campus environment. The Plan also includes opportunities for development of much-needed on-campus housing. While the Plan guides physical development necessary to achieve the University's mission based on projected growth, it is not a commitment for growth or specific projects. It establishes a long-term development framework for the revitalization of the physical environment at Parnassus Heights, by identifying the following:

- Opportunity sites for new buildings and major renovations of existing buildings;
- Candidate buildings for demolition;
- Opportunities for development of open spaces; and
- Opportunities for improvements to on-campus mobility and circulation.

The CPHP includes an Initial Phase that primarily comprises: 1) Irving Street Arrival improvements, 2) Research and Academic Building (RAB), 3) initial Aldea Housing Densification, and 4) New Hospital; as well as other Initial Phase activities. This phase is anticipated to be completed by approximately year 2030. Beyond the Initial Phase, the "Future Phase" encompasses the remaining development described in the CPHP envisioned for completion by the horizon year of 2050.

In total, the CPHP provides for development of approximately 2.9 million gsf of new building space at Parnassus Heights. When accounting for existing campus site development (approximately 3.9 million gsf); demolition that was approved under the

(continued on next page)

2014 Long Range Development Plan (LRDP) but yet not implemented; and potential additional building demolition that would occur under the CPHP, the total amount of campus space upon full implementation of the CPHP would be approximately 6.0 million gsf, including instruction, research, clinical, and support space; housing; and structured parking. The CPHP is available at: https://ucsf.app.box.com/v/parnassusplan

Because the CPHP proposes to modify the Parnassus Heights development plans identified in the 2014 LRDP, an amendment of the 2014 LRDP is proposed.

For purposes of the California Environmental Quality Act (CEQA), the University of California is lead agency.

This project may have a significant effect on the environment and an Environmental Impact Report is required. This determination is based upon the criteria of the State CEQA Guidelines, Sections 15063 (Initial Study), 15064 (Determining Significant Effect), and 15065 (Mandatory Findings of Significance), and for the reasons documented in the Initial Study for the project.

Public Review and Comment

As indicated above, the NOP/Initial Study is available at http://campusplanning.ucsf.edu/ for a 31-day public review and comment period beginning **January 14, 2020 through February 14, 2020.**

To give written feedback on the NOP/Initial Study, comments should be sent to the attention of Ms. Diane Wong at the address noted below, or submitted via email to the following address: **EIR@planning.ucsf.edu**. All comments must be received no later than **February 14, 2020**.

If you would like a paper copy of the NOP/Initial Study, please call the UCSF Campus Planning office at 415-476-2911.

Paper copies of the NOP/Initial Study will also be available for viewing at the UCSF Library at 530 Parnassus Avenue, and the following public library branches: San Francisco Main Branch, 100 Larkin Street; Sunset Branch, 1305 18th Avenue; and the Park Branch, 1833 Page Street.

UCSF will hold a public EIR scoping meeting on Monday, February 10, 2020. The meeting will be held at the Parnassus Heights campus site at Millberry Union, 500 Parnassus Avenue, beginning at 6:30 PM.

The EIR scoping meeting provides an opportunity for the community to provide verbal feedback on the Initial Study. This allows UCSF to learn about potential concerns early, as well as further define the issues, feasible alternatives, and potential mitigation measures that may warrant in-depth analysis in the environmental review process.

Submit comments on the Initial Study and EIR scoping to:
Diane Wong, Environmental Coordinator
UCSF Campus Planning
654 Minnesota Street
San Francisco, CA 94143-0286
EIR@planning.ucsf.edu

University of California
San Francisco

INITIAL STUDY

University of California, San Francisco
Comprehensive Parnassus Heights Plan

Lead Agency: University of California

January 2020

UCSF COMPREHENSIVE PARNASSUS HEIGHTS PLAN

Initial Study

Prepared for
UCSF Campus Planning

January 14, 2020

D190291.00

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UCSF COMPREHENSIVE PARNASSUS HEIGHTS PLAN

Initial Study

1. Project Information

1. **Project Title:** UCSF Comprehensive Parnassus Heights Plan

2. **Lead Agency Name and Address:** The Regents of the University of California
1111 Franklin Street, 12th Floor
Oakland, California 94607

3. **Contact Person and Phone Number:** Diane Wong
Principal Planner/Environmental Coordinator
UCSF Real Estate - Campus Planning
(415) 502-5952
diane.wong@ucsf.edu

4. **Project Location:** UCSF Parnassus Heights Campus Site

5. **Project Sponsor's Name and Address:** See contact person listed above.

6. **Custodian of the Administrative Record for this Project:** Same as above.

7. **Description of Project:**

   See Section 2, Project Description, below.

8. **Surrounding Land Uses and Setting:**

   See Section 2, Project Description, below.

9. **Other public agencies whose approval is required** (e.g., permits, financing approval, or participation agreement.)**:**

   See Section 2, Project Description, below.

10. **Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?**

    On September 9, 2019, UCSF sent notification letters of UCSF's proposal to undertake the CPHP to the applicable representatives for the Amah Mutsun Tribal Band of Mission

San Juan Bautista; Coastanoan Rumsen Carmel Tribe; Ohlone Indian Tribe; Indian Canyon Mutsun Band of Costanoan; Torres Martinez Desert Cahuilla Indians; and Muwekma Ohlone Indian Tribe of the San Francisco Bay Area. No responses to the notification letters were received from the tribes within the 30-day response period, consistent with the requirements of Public Resources Code section 21080.3.1(d).

2. Project Description

2.1 Introduction

Each campus of the University of California is required to periodically prepare a Long Range Development Plan (LRDP) that sets forth concepts, principles, and plans to guide future growth of that campus. In November 2014, the Regents of the University of California (Regents) adopted the 2014 LRDP for the San Francisco campus, which outlines projected development levels and patterns for UCSF at all of its main campus sites through the year 2035. The 2014 LRDP Final EIR (FEIR) was certified by the Regents in November 2014 and includes, among other things, analysis of the potential environmental impacts from then-envisioned development at the Parnassus Heights campus site.

The Parnassus Heights campus site (Parnassus Heights, or campus site) is the oldest and largest of the UCSF campus sites. The facilities at Parnassus Heights are aging and the site as a whole lacks a cohesive identity. Over the last 20 years, UCSF has invested billions of dollars into acquiring, developing, and supporting its Mission Bay campus site, without commensurate investment in Parnassus Heights. UCSF's investment in Parnassus Heights has not kept pace with its aging facilities or changes in programmatic need, resulting in infrastructure, buildings, and interior spaces that require substantial renewal and investment.

Since the adoption of the 2014 LRDP and certification of the 2014 LRDP FEIR, UCSF undertook a planning process to re-envision and revitalize Parnassus Heights as a whole, to integrate UCSF's clinical, educational, and research missions in ways that promote collaboration and synergies in the UCSF Parnassus Heights campus community. The planning process resulted in the development of the Comprehensive Parnassus Heights Plan (CPHP, or Plan), which provides a long-term development framework for the revitalization of the Parnassus Heights physical environment, and is intended to ensure that a modernized Parnassus Heights enhances UCSF's status as an anchor institution in San Francisco.

The proposed CPHP is subject to review under the California Environmental Quality Act (CEQA). UCSF is serving as the Lead Agency under CEQA for the proposed CPHP. This Initial Study, and forthcoming EIR, respectively, has been and will be prepared in accordance with CEQA to analyze potential environmental impacts that could result from implementing the CPHP. The CPHP EIR will be a program-level EIR that programmatically analyzes the environmental impacts of the CPHP which is envisioned to be completed by horizon year 2050. The CPHP EIR also will provide project-level analyses of specific near-term projects proposed for the initial phase of CPHP implementation that are planned for completion by approximately 2030. This EIR will analyze the CPHP proposals based on the level of information available for each project at the time of preparation of this EIR.

Because the CPHP proposes to modify the Parnassus Heights development plans identified in the 2014 LRDP, an amendment of the 2014 LRDP is proposed.

UCSF has also begun to plan the New Hospital at Parnassus Heights (NHPH or New Hospital) and is projecting the need for a larger hospital than was planned in the 2014 LRDP. The planning, design and construction of a new, world-class hospital at Parnassus Heights would ensure that UCSF can continue to provide premier care to patients in the San Francisco Bay Area and beyond in the 21st century. Although parameters for the New Hospital project (location, size, projected population) are accounted for in the CPHP and will be analyzed at a program level in the Draft EIR, the New Hospital represents a major project for UCSF and many details of the New Hospital are still being developed. Therefore, the New Hospital will be the subject of a subsequent project-specific environmental review separately from the CPHP when more details become available.

2.2 Campus Site Location and Existing Site Characteristics

Figure 1 presents an aerial of the Parnassus Heights campus site location and vicinity. The Parnassus Heights campus site is located in the Inner Sunset mixed-use neighborhood in San Francisco, bounded by Carl and Irving Streets to the north; Third Avenue and Fifth Avenue to the west; and Clarendon Avenue, Christopher Drive, and Crestmont Drive to the south. The campus site's east boundary abuts the Cole Valley neighborhood and the City's Interior Greenbelt Natural Area.

The irregularly-shaped campus site comprises 107 acres. UCSF's facilities are concentrated at the north end of the campus site, where Moffitt and Long Hospitals, four professional schools, clinics, research, housing, parking, and other support uses are located. The 61-acre Mount Sutro Open Space Reserve (Reserve) occupies the central and southern portion of the campus site. The Aldea Housing complex is located in the southeast portion of the campus site adjacent to the Reserve.

The current average daily population at Parnassus Heights is estimated at approximately 17,400 persons, including faculty and staff, students, patients, and visitors. There are currently nearly 7,400 UCSF faculty and staff employed at the campus site. About 580 residents currently reside in UCSF housing at the Parnassus Heights campus site.

2.3 Relationship of CPHP to 2014 LRDP

The 2014 LRDP serves as a comprehensive physical land use plan and policy document to guide the physical development of the San Francisco campus, accommodating future increases in enrollment and academic and research activities at UCSF and meeting its projected educational and research demand. The existing 2014 LRDP accommodates development anticipated to occur by horizon year 2035. The 2014 LRDP contains objectives to guide decisions for future facilities to meet demands and projects the quantities and uses of new building space needed during this time frame.

Because the CPHP proposes to modify the Parnassus Heights development plan identified in the 2014 LRDP, an amendment of the 2014 LRDP is proposed. The proposed LRDP Amendment would revise those portions of the 2014 LRDP pertaining to Parnassus Heights to incorporate concepts and proposals identified in the CPHP. Proposed changes would include revisions to



SOURCE: Google Earth, 2019; ESA, 2019

UCSF Comprehensive Parnassus Heights Plan EIR

Figure 1
Parnassus Heights Campus Site Location and Vicinity

ESA

functional zones; revisions to the space program, update to estimated population; revisions to existing planning agreements, including revisions to the Regents' Resolution, and an update to the Greenhouse Gas Reduction Strategy.

If the CPHP is approved by the Regents and the 2014 LRDP is amended, the CPHP would become the primary planning document for Parnassus Heights and would be used by UCSF to guide the development of the campus site through the next 30 years, or an approximate horizon year of 2050. Nevertheless, all other UCSF campus sites addressed by the UCSF 2014 LRDP would continue to have an approximate horizon year of 2035.

2.4 CPHP

CPHP Features

The CPHP establishes a long-term development framework for the revitalization of the physical environment at Parnassus Heights, by identifying the following:

- Opportunity sites for new buildings and major renovations of existing buildings;
- Candidate buildings for demolition;
- Opportunities for development of open spaces; and
- Opportunities for improvements to on-campus mobility and circulation.

In total, the CPHP provides for development of approximately 2.9 million gross square feet (gsf) of new building space at Parnassus Heights. When accounting for existing campus site development; demolition that was approved under the 2014 LRDP but yet not implemented, and potential additional building demolition that would occur under the CPHP, the total amount of campus space upon full implementation of the CPHP would be approximately 6.0 million gsf, including instruction, research, clinical, and support space; housing; and structured parking.

The CPHP includes an "Initial Phase" that primarily comprises: 1) Irving Street Arrival improvements, 2) Research and Academic Building (RAB), 3) New Hospital and 4) initial Aldea Housing Densification. The Initial Phase would account for approximately 1.4 million gsf of new building development, and is anticipated to be completed by approximately year 2030. Beyond the Initial Phase, the "Future Phase" encompasses the remaining approximately 1.5 million gsf of new building development described in the CPHP, and is envisioned for completion by the horizon year of 2050.

A program EIR will be prepared for the CPHP that will establish a framework for tiered or project-level environmental documents that would be prepared in accordance with the overall program. Accordingly, the EIR will provide a program-level analysis of the environmental impacts from the development of the entire space program under the CPHP, and identify Plan-level mitigation measures to reduce potential significant effects of the CPHP. In addition, the EIR will include project-level analysis for the following CPHP Initial Phase developments: Irving Street Arrival, RAB, and initial Aldea Housing Densification. The analysis of these Initial Phase development proposals at the project-level is intended to provide sufficient detail permit to permit project approval and implementation following certification of the CPHP Final EIR. The fourth CPHP

Initial Phase project – the proposed New Hospital – will be analyzed at a program level in this EIR, but because it represents a major project for UCSF, it will undergo additional project-level environmental review separately from the CPHP when more details become available. Similarly, when details on CPHP Future Phase projects are known, each Future Phase project would be reviewed in light of the CPHP Final EIR to determine the appropriate level of additional environmental review, if any, needed before approval and implementation of the particular project.

Opportunity Sites for New Development

Opportunities for new development under the CPHP include:

- New construction of clinical, educational, research, and housing facilities on opportunity sites throughout the campus (see **Figure 2**);
- Additional housing development at the Aldea Housing site;
- Open space enhancements throughout the campus, most notably the Millberry Terrace, the expansion of Saunders Court, and the Promenade to the south of the current UC Hall;
- Extension of Fourth Avenue as a campus street between Parnassus Avenue and Kirkham Street;
- Development of a service and utility corridor at the back of the campus to connect Medical Center Way to Koret Way and the proposed extension of Fourth Avenue;
- Public realm improvements, including within the campus core (along Parnassus Avenue generally between Fifth Avenue and Medical Center Way); and
- Development of a bridge across, and tunnel beneath, Parnassus Avenue associated with the New Hospital.

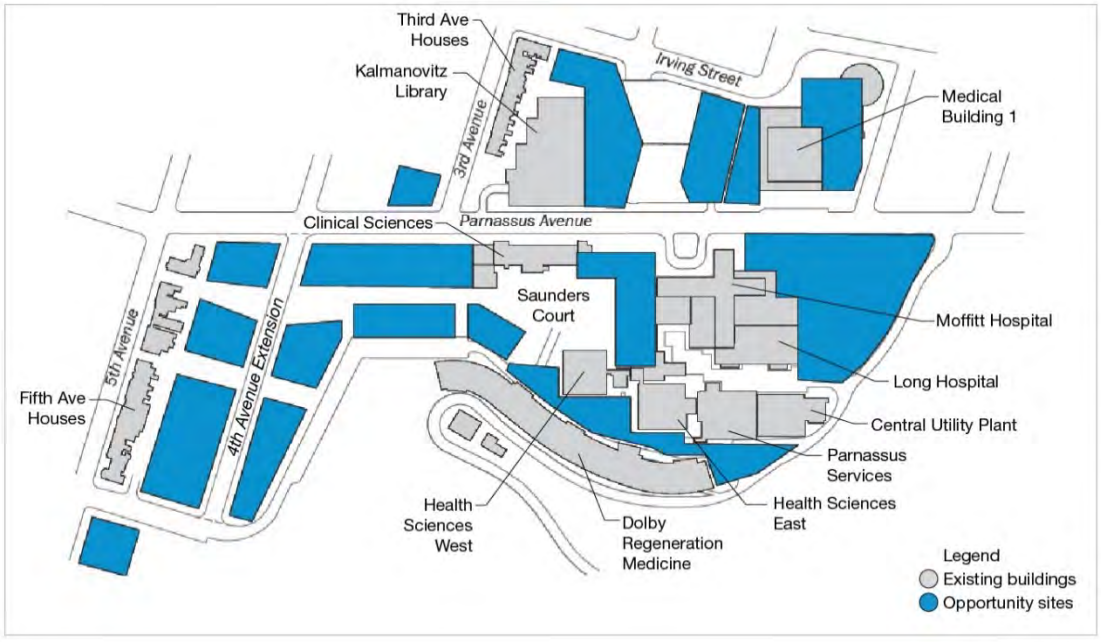

Figure 2
CPHP Opportunity Sites in Campus Core

Redevelopment under the CPHP would entail demolition of structures beyond those identified in the 2014 LRDP, to make way for new buildings (see **Figure 3** for an illustration of potential demolitions within the campus core). Demolitions to occur as part of the CPHP may include UC Hall, Dental Clinics, School of Nursing building, Millberry Union and Garage (either wholly or partially), Lucia Child Care Center, Kirkham Child Care Center, and all of the residential structures of the Aldea Housing complex.

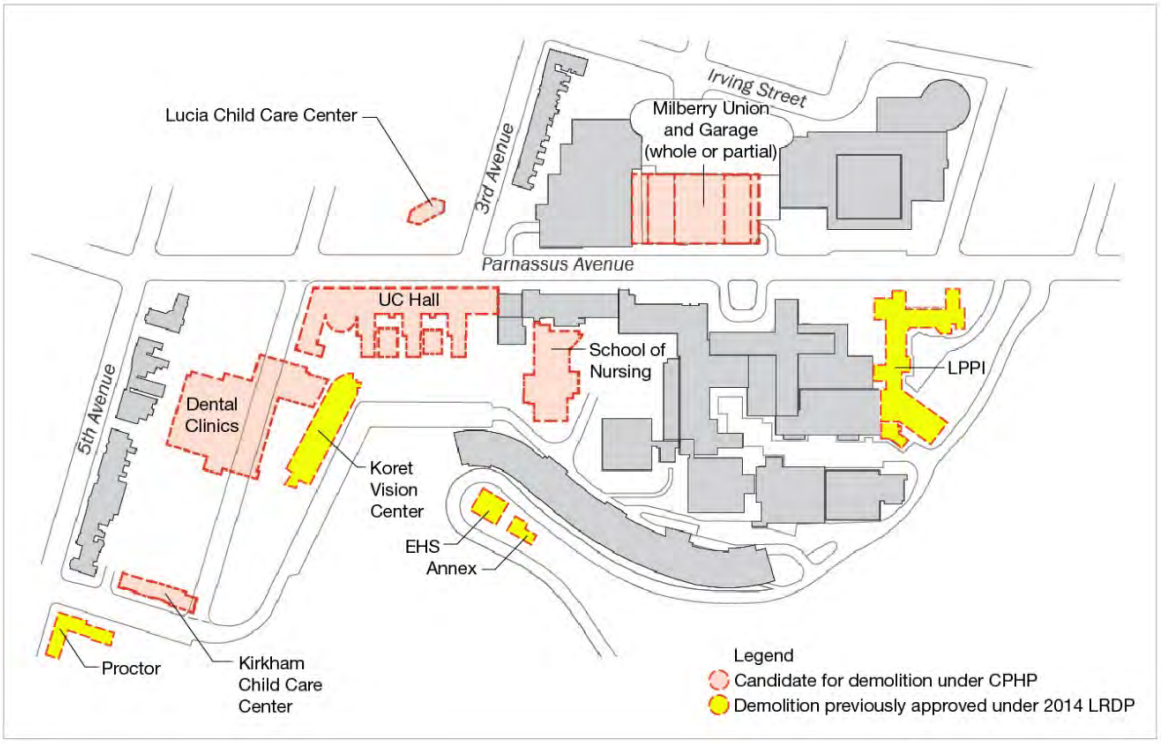

Figure 3
Potential Demolitions in Campus Core

There is the potential for certain new development under the CPHP to result in the need to modify the Reserve boundary. UCSF proposes to replace any area of the Reserve that is lost due to new development under the CPHP by designating new Reserve area elsewhere on the campus site in an amount equal to or greater than that area lost.

CPHP Initial Phase

Figure 4 identifies the location of each of the Initial Phase developments.

Irving Street Arrival

The proposed Irving Street Arrival includes modification of the portion of the existing Medical Building 1 in order to develop a new and/or reconfigured multi-story vertical circulation space to include express elevators or escalators, stairs, and arrival features such as information and orientation areas (the "unified lobby"). The new/modified structure would be about 25,000 gsf, and include an additional two stories on the Irving Street side (increasing to a total of 8 stories

and up to 86 feet in height) and an additional two stories on the Parnassus Avenue side (increasing to a total of three stories and up to 45 feet in height). The Irving Street Arrival project would also include replacing the facades or reskinning of the Millberry Union and Medical Building 1 garage structures.



Figure 4
CPHP Initial Phase Projects

Research and Academic Building

The proposed RAB would be located on the current site of UC Hall, following the proposed demolition of this building. UC Hall is potentially eligible for the National Register of Historic Places and the California Register of Historic Resources, although is not currently formally nominated for either register. The School of Nursing building would also be demolished as part of this Initial Phase project.

The proposed RAB would be approximately 270,000 gsf and eight stories tall (up to 130 feet in height), and would contain primarily research and education space. Development of the RAB site could also include components of the CPHP intended to be constructed incrementally that are adjacent to the RAB site, such as a portion of the promenade, the service/utility corridor to the south of the RAB site, and the first increment of Fourth Avenue extension to the west of the RAB site.

New Hospital, and Bridge and Tunnel Across Parnassus Avenue

The proposed New Hospital would be located on the site of LPPI on the south side of Parnassus Avenue between Medical Center Way and Moffitt Hospital. As currently proposed, the New Hospital would be about 955,000 gsf, and 16 stories tall (up to 294 feet in height).[1] The New Hospital would have the capacity for approximately 384 inpatient beds. The portion of Medical Center Way adjacent to the New Hospital site would be widened for fire safety purposes. The widening of Medical Center Way and the New Hospital footprint are projected to result in the need to modify the Reserve boundary. As indicated above, UCSF would replace any area of the Reserve that is lost due to new development under the CPHP by designating new Reserve area elsewhere within the campus site.

To facilitate pedestrian safety, ease of crossing Parnassus Avenue, and patient transport, a pedestrian bridge over Parnassus Avenue is proposed connecting the New Hospital to the Irving Street Arrival. A tunnel beneath Parnassus Avenue connecting the south side of the campus to the north side is also proposed. The tunnel is intended for pedestrians, utility lines, and the movement of goods and materials, to reduce the amount of activity and congestion that occurs on Parnassus Avenue and to provide a safer crossing experience for patients, visitors, employees, and students.

Initial Aldea Housing Densification

The CPHP envisions densification of the Aldea Housing site by demolishing the existing student housing structures, and constructing student housing in new buildings, in the approximate location of existing building foundations. In this initial phase, the three existing 3-story 1960s-era housing structures (individually eligible for the CRHR and NRHP) at Aldea would be replaced with three 8-story housing structures (up to 96 feet in height) and one 5-story housing structure (up to 60 feet in height), increasing the number of dwelling units by 142 units (i.e., from 42 existing units to a proposed 184 units).

Other Improvements

Utility Improvements

A proposed multi-level service corridor would extend from roughly Medical Center Way to Koret Way and the new extension of Fourth Avenue to facilitate transport of goods and materials for

[1] Excluding potential rooftop design features, observation deck, elevator vestibule and roof top mechanical that would occupy a portion of the roof, and that would consist of about 5% to 7% of the height of the New Hospital. This will be analyzed in more detail in the EIR for the New Hospital. As currently conceived, the majority of mechanical equipment would be contained within various levels of the New Hospital to minimize the amount of equipment located on the roof.

back-of-house functions and to provide easy access to major utility lines serving the campus. Utilities anticipated in the service corridor include steam, chilled water, condensate return pipes, domestic and fire water, electrical and communications. In addition, additional emergency and domestic water storage, and emergency sewer effluent storage, is proposed at the campus site.

In addition, existing utilities in the vicinity of the New Hospital site would be modified or relocated, including at the existing site of the ammonia tank at Parnassus Avenue near Medical Center Way, to enhance functionality of utilities serving the campus site and to improve aesthetics along Parnassus Avenue.

Parnassus Avenue Streetscape Plan

The 2014 LRDP FEIR analyzed the Parnassus Streetscape Plan, a proposal that called for improvements along Parnassus Avenue generally between Fifth Avenue and Medical Center Way. Slight modifications to the Parnassus Avenue Streetscape Plan would be made to conform to new development proposals that front Parnassus Avenue.

Renovation of Existing Buildings

The CPHP identifies opportunity sites for building renovations (i.e., separate from those buildings identified in the CPHP as opportunity sites for demolition and new construction). Opportunity sites for notable renovations include the HSIR Towers and the Medical Sciences Building.

Cushioning Actions

UCSF may voluntarily propose improvements to public streets or other public realm areas that, while not considered mitigation measures under CEQA, may nonetheless improve operations or otherwise enhance conditions at those locations.

CPHP Future Phase

The CPHP Future Phase comprises all remaining development opportunities identified under the CPHP. Potential development includes the following:

Millberry Union New Towers and Terrace

The CPHP envisions redevelopment of Millberry Union by demolishing the existing Millberry Union towers and constructing a larger facility of about 260,000 gsf. The two new towers that would flank a new terrace would be five stories (approximately 64 feet in height) as measured from Parnassus Avenue; and eight stories (up to 86 to 90 feet in height) along Irving Street. The new building could contain clinical, instruction, and research space, as well as campus community space.

It is possible that in order to construct the facility, the existing Millberry Union would need to be demolished in its entirety, depending on the seismic condition of the building, cost, and other factors at the time the proposal is implemented. It is also possible that the Millberry Union garage, upon which Millberry Union sits, would need to be reconstructed in order to support the new structure.

Hotel for Patients and Families

The CPHP envisions the demolition of the existing Lucia Child Care center and the construction of a 48,000 gsf hotel to provide lodging for both patients and families of patients who are staying at the hospital for an extended period. The Plan envisions a building of about three stories and up to 53 feet in height. A nominal amount of parking could be constructed on this site.

New Program Adjacent to RAB

The CPHP identifies opportunities for future development behind the future RAB on a site that is largely vacant except for a small storage and loading area. The CPHP also identifies opportunities for future development to the southwest of the RAB, which would necessitate demolition of the Koret Vision Center building and Dental Clinics building. Future uses in these new spaces, which would total about 582,000 gsf, would include primarily research and academic space. The buildings would range from three to nine stories (up to 45 to 130 feet in height). The existing Faculty Alumni House as well as UCSF-owned housing along the east side of Fifth Avenue would remain.

West Side Housing

The CPHP includes the development of new housing for students and staff to address the pressing need for affordable housing in San Francisco, which has reached crisis levels. Approximately 281,000 gsf of new housing within the West Side district would be located on both sides of the proposed Fourth Avenue extension. Approximately 430 units of housing are proposed. The structures would range from approximately six to ten stories up to 72 to 120 feet in height, and would step down (east to west) along the slope.

Development on the site would require demolition of the Kirkham Child Care center and the West Side Parking Lot. Parking spaces lost from demolition of the West Side Parking Lot and from alterations of the Millberry Union garage would be replaced at the West Side Housing site.

Child Care on Proctor Site

The CPHP envisions that the Proctor building would be demolished and replaced with a new three-story, up to 35-foot tall childcare facility of about 35,000 gsf. An outdoor play area, a nominal amount of on-site parking, and a drop-off area would be included.

Future Phase of Aldea Housing

In the Future Phase, the remaining nine 3-story existing housing structures in the Aldea complex would be replaced with eight 5-story housing structures (up to 60 feet in height), increasing the number of dwelling units in this phase by 190 units). A small daycare center of about 15,000 gsf is also proposed within the complex under the CPHP.

Open Space

The Plan envisions an increase in the amount of usable open space on campus. The most notable of these spaces include the Millberry Terrace, to be located atop the altered or new Millberry Union garage; an expansion of Saunders Court; and the proposed Promenade, to be located to the

west of Saunders Court and south of the RAB. The Plan also indicates potential additional pathways leading to the Mount Sutro Open Space Reserve. As part of providing a visual and physical connection to open spaces such as Saunders Court and the Promenade, as well as to the pathways to the Reserve, the façade of the Medical Sciences Building could be altered.

Utilities and Infrastructure

Additional domestic and emergency water, waste wastewater/stormwater, electric and natural gas, heating and chilled water, and/or telecommunications utility improvements would occur throughout the campus site to accommodate Future Phase development, including but not limited to, utility improvements to serve the proposed Future Phase development on the west side of the campus core, and Future Phase Aldea Housing development. In addition, existing utilities in the vicinity of the New Hospital site would be modified or relocated, including at the existing site of the ammonia tank at Parnassus Avenue near Medical Center Way, to enhance functionality of utilities serving the campus site and to improve aesthetics along Parnassus Avenue.

Circulation, Transportation and Parking

As mentioned above, the Plan envisions the extension of Fourth Avenue as a campus street between Parnassus Avenue and Kirkham Street. The extension of Fourth Avenue would serve as the main access point for future new buildings to the west of the proposed RAB, including the new housing structures on the West Side.

2.5 Revisions to the 2014 LRDP

Proposed LRDP Amendment No. 6 would revise those portions of the 2014 LRDP pertaining to Parnassus Heights to incorporate concepts and proposals identified in the CPHP. Proposed changes would include the following:

- Revisions to functional zones
- Revisions to the space program
- Update to estimated population
- Revisions to Regents' Resolution
- Update to Greenhouse Gas Reduction Strategy

Revised Functional Zones

Each primary campus site identified in the 2014 LRDP includes a functional zone map reflecting the plans for predominant land uses. The functional zone map would be amended to be consistent with the districts proposed in the CPHP.

Revised Space Profile

The LRDP amendment would increase the future buildout space program at Parnassus Heights from the currently approved 3.61 million gsf (excluding housing) in horizon year 2035 to approximately 5.05 million gsf (excluding housing) in horizon year 2050, a net increase of

approximately 1.44 million gsf. When compared to the existing (2019) space developed at the campus site (approximately 3.68 million gsf, excluding housing), the proposed LRDP amendment would result in a net increase in the space program by approximately 1.37 million gsf (excluding housing) by 2050.

Updated Population Estimates

The LRDP amendment would result in an increase in the estimated average daily population from approximately 18,500 in horizon year 2035 to about 25,300 in horizon year 2050, a net increase of approximately 6,800. When compared to the existing (2018) average daily population at the campus site (approximately 17,400), the proposed LRDP amendment would result in a net increase in the average daily population by nearly 7,900 by 2050 (approximately 74 percent of which would occur in the Initial Phase).

Revisions to Regents' Resolution

UCSF proposes to ask the Regents to update the Regents' Resolution to:

- Reaffirm continuing commitments, including 1) maintaining the designation of the Mount Sutro Open Space Reserve as permanent open space, potentially including an adjustment to the Reserve boundary while maintaining a minimum of 61 acres in the Reserve; 2) continuing to respect the Parnassus Heights campus boundary established in 1976; and 3) continuing to adhere to the expansion restriction area within which UCSF would not acquire property or lease residential property.
- Increase the space ceiling limit from the current 3.55 million gsf to a proposed 5.05 million gsf, excluding housing (an increase of approximately 1.5 million gsf above the current space ceiling limit) in recognition of the tremendous need for program space in order for UCSF to retain its leadership position in patient care, research, and education.

Update to Greenhouse Gas Reduction Strategy

The 2014 LRDP included a UCSF Greenhouse Gas Reduction Strategy (GHGRS) to ensure that the LRDP is implemented in alignment with UC Sustainable Practices Policy, and to fulfill the GHG reduction requirements of the State of California Assembly Bill 32 (AB 32): the California Global Warming Solutions Act of 2006. Proposed LRDP Amendment No. 6 includes an update to the GHGRS which incorporates emissions generated by CPHP construction and operations.

3. Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☒ Aesthetics	☐ Agriculture and Forestry Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☒ Energy
☒ Geology/Soils	☒ Greenhouse Gas Emissions	☒ Hazards & Hazardous Materials
☒ Hydrology/Water Quality	☒ Land Use/Planning	☐ Mineral Resources
☒ Noise	☒ Population/Housing	☒ Public Services
☒ Recreation	☒ Transportation	☒ Tribal Cultural Resources
☒ Utilities/Service Systems	☐ Wildfire	☒ Mandatory Findings of Significance

4. Determination

On the basis of this initial study:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature

January 14, 2020
Date

5. Evaluation of Environmental Effects

Appendix G of the CEQA Guidelines provides a suggested format to use when preparing an Initial Study. The Environmental Checklist used in this document adopts a different format while still addressing the Appendix G checklist questions for each environmental issue area.

The attached Environmental Checklist uses the following response headings to identify potential environmental effects that will be addressed in the CPHP EIR:

1. **Impact to be Analyzed in CPHP EIR:** An effect that may or may not be significant that will be addressed in the CPHP EIR. The effect may be a less-than-significant impact that will be addressed to provide a more comprehensive analysis; an impact for which further analysis is necessary or desirable before a determination about significance can be made; an impact that is potentially significant but may be reduced to a less-than-significant level with the adoption of mitigation measures; or an impact that may be significant and unavoidable. The CPHP EIR will programmatically analyze the environmental impacts of the proposed CPHP which is envisioned to be completed by horizon year 2050. The CPHP EIR will also provide project-level analyses of specific projects proposed for the initial phase of CPHP implementation.

2. **No Additional Analysis Required:** Implementation of the proposed CPHP or a specific project under the initial phase of the CPHP would clearly result in no impact or result in a less-than-significant impact under CEQA criteria, no analysis beyond that provided in this Initial Study is necessary.

The 2014 LRDP FEIR analyzed the impacts of the planned growth and development at the Parnassus Heights campus site under the 2014 LRDP at a program level. It also included a project-level analysis for a number of specific projects, and those projects were approved for implementation at the time the 2014 LRDP was approved.

The CPHP is a revised plan for the Parnassus Heights campus site, and includes a larger development program for the campus site than previously analyzed in the 2014 LRDP FEIR with a longer time horizon under which the envisioned development program would be implemented. The CPHP excludes some of the specific projects that were previously approved in the 2014 LRDP as they will be implemented separately from the CPHP based upon the prior analysis and approval. If approved, the CPHP will replace the 2014 LRDP as the land use planning document for the Parnassus Heights campus site.

This Initial Study, and forthcoming EIR, analyze the potential significant environmental impacts that could result if the CPHP is approved and implemented. The CPHP EIR and its Initial Study will replace in full the program-level analysis for the Parnassus Heights campus site contained in the 2014 LRDP FEIR. As some of the information in the 2014 LRDP FEIR is still relevant and has been used to characterize existing conditions and inform the impact analysis in the CPHP EIR, including applying pertinent 2014 LRDP EIR mitigation measures to the CPHP projects, the 2014 LRDP FEIR is incorporated by reference in this EIR and its Initial Study.

5.1 Aesthetics

Issues (and Supporting Information Sources):		*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
I.	**AESTHETICS —** Except as provided in Public Resources Code Section 21099, would the project:		
a)	Have a substantial adverse effect on a scenic vista?	☒	☐
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☒
c)	In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☒	☐
d)	Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area?	☒	☐
e)	Create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces?	☒	☐
f)	Create wind hazards in publicly accessible areas of substantial pedestrian use?	☒	☐

Discussion

a) As described in Section 2, *Project Description*, the Initial Phase projects contemplated under the proposed CPHP would range from three to eight stories (up to 45 to 130 feet) in height, with the exception of the New Hospital, which would be 16 stories (up to 294 feet in height). Future Phase projects would range in height from three to ten stories (up to 35 to 130 feet in height). Given the heights of the proposed structures, the prominent location of the Parnassus Heights campus core on the north-facing slope of Mount Sutro, and the location of the Aldea Housing area on the south-facing slope of Mount Sutro, development under the proposed CPHP would be visible from a number of distant public view locations. As a result, the CPHP EIR will consider the potential effects of the proposed development on scenic vistas.

b) There are no state-designated scenic highways in the vicinity of the Parnassus Heights campus site. Therefore, no further study of the effects of CPHP implementation on scenic resources within a state scenic highway is necessary, and this topic will not be analyzed in the CPHP EIR.

c) The location, height, and massing of the structures and other development contemplated under the proposed CPHP would alter the visual character of the Parnassus Heights campus site. For this reason, the potential effects of the proposed CPHP on the existing visual character and quality of the campus site and its surroundings will be evaluated in the CPHP EIR.

d) The Parnassus Heights campus core is densely developed with multiple structures and is located in an urban environment characterized by high level of ambient nighttime illumination. Development under the proposed CPHP would increase the amount of nighttime illumination on the campus site and vicinity. In addition, building roofs, windows and other exterior building features and materials would have the potential to include reflective surfaces

and increase glare under the proposed CPHP. As a result, the CPHP EIR will consider the potential effects of light and glare from new development.

e) The proposed CPHP would increase overall development at the Parnassus Heights campus site and consequently, would have the potential to create new shadows. Public open spaces under the control of the San Francisco Recreation and Park Department (RPD) are protected by the City's Sunlight Ordinance (Section 295 of the Planning Code). Section 295 prohibits the issuance of building permits for structures or additions to structures greater than 40 feet in height that would shade property under the jurisdiction of or designated to be acquired by the Recreation and Park Commission, during the period from one hour after sunrise to one hour before sunset. Pursuant to the University of California's constitutional autonomy, development and uses on property under the control of the University that are used in furtherance of the University's educational purposes are not subject to local land use regulation, including City of San Francisco Planning Code. Although UCSF is not subject to local standards, UCSF will strive to be consistent with the standards, where feasible.

   The nearest public open spaces under control of the San Francisco RPD to the Parnassus Heights campus site are Golden Gate Park, located one block (approximately 400 feet) to the north of the campus site, Richard Gamble Memorial Park, located about five blocks or 2,000 feet to the northeast of the campus site, Grattan Playground, located approximately 1,000 feet to the east of the campus site, and the Interior Greenbelt, located adjacent to the campus site, east of the Reserve. Due in part to the height of the Parnassus Heights campus site relative to surrounding development, new development under the proposed CPHP, including the New Hospital, would cast shadow on nearby public open spaces. In addition, development under the proposed CPHP, including the New Hospital, would cast shadow on the Reserve, which is also open to the public, but not subject to the jurisdiction of RPD. Therefore, the CPHP EIR will consider the potential effects of shadow on public open space from new development under the CPHP for informational purposes.

f) Building development under the proposed CPHP could create street-level winds that could be detrimental to pedestrians on the Parnassus Heights campus site. For this reason, the CPHP EIR will consider the potential for development under the proposed CPHP to create hazardous street-level winds in publicly accessible areas of substantial pedestrian use within the Parnassus Heights campus site.

5.2 Agriculture and Forestry Resources

Issues (and Supporting Information Sources):		*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
II.	**AGRICULTURE AND FORESTRY RESOURCES —** In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:		
a)	Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☒
b)	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☒
c)	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☒
d)	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☒
e)	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☒

Discussion

a) No agricultural uses are located on the Parnassus Heights campus site, and no land on the campus site is designated as Important Farmland on maps prepared pursuant to the Farmland Mapping and Monitoring Program. Consequently, no impact related to conversion of agricultural land would occur under the proposed CPHP, and this topic will not be evaluated further in the CPHP EIR.

b-c) The Parnassus Heights campus site is designated for urban uses. No portion of the campus site is zoned for agricultural use, forest land or timberland. In addition, there is no Williamson Act contract applicable to the Parnassus Heights campus site or its vicinity. Consequently, no impact related to conflicts with zoning for these lands would occur under the proposed CPHP, and these topics will not be evaluated further in the CPHP EIR.

d) The Reserve includes a variety of vegetation, including, but not limited to, blue gum eucalyptus (*Eucalyptus globulus*), Monterey cypress (*Cupressus macrocarpa*), and Blackwood acacia (*Acacia melanoxylon*) (UCSF, 2014; UCSF, 2018). There is the potential for certain new development under the CPHP, including the proposed New Hospital and associated widening of Medical Center Way adjacent to the New Hospital, to result in on the need to modify the Reserve boundary, and therefore, may result in a loss and conversion of forest land within the Reserve to a non-forest use. UCSF proposes to replace any area of the Reserve that is lost, including forest land, due to new development under the CPHP by designating new Reserve area elsewhere on the campus site in an amount equal or greater to

that area lost. Consequently, the impact to loss or conversion of forest land would be less than significant, and this topic will not be evaluated further in the CPHP EIR.

e) No Important Farmland or other agricultural land is present in the vicinity of the campus site. Therefore, development under the proposed CPHP would not involve any changes that could indirectly cause conversion of Important Farmland to non-agricultural use. As discussed in checklist item "d," above, UCSF proposes to replace any area of the Reserve that is lost, including forest land, due to new development under the CPHP by designating new Reserve acreage elsewhere on the campus site in an amount equal or greater to that area lost. Consequently, the impact resulting from conversion of forest land would be less than significant, and this topic will not be evaluated further in the CPHP EIR.

References

University of California, San Francisco (UCSF). 2014. *UCSF 2014 Long Range Development Plan Final Environmental Impact Report*. November.

UCSF. 2018. *UCSF Vegetation Management Plan for the Mount Sutro Open Space Reserve Final Environmental Impact Report*. March.

5.3 Air Quality

Issues (and Supporting Information Sources):		*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
III.	**AIR QUALITY —** Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:		
a)	Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐
b)	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☒	☐
c)	Expose sensitive receptors to substantial pollutant concentrations?	☒	☐
d)	Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☒
e)	Exceed the LRDP EIR standard of significance by exposing receptors to toxic air contaminant emissions that (1) result in a cancer risk greater than 10 cancer cases per 1 million people exposed in a lifetime; or (2) for acute or chronic effects, result in concentrations of toxic air contaminant emissions with a Hazard Index of 1.0 or greater.	☒	☐

Discussion

a) The most recent clean air plan is the Bay Area 2017 Clean Air Plan that was adopted by the Bay Area Air Quality Management District (BAAQMD) in April 2017. Consistency with this plan is the basis for determining whether development under the proposed CPHP would conflict with or obstruct implementation of air quality plans. Development under the proposed CPHP would increase both stationary and mobile sources of air emissions, which contribute to regional air pollution. Air pollutant emissions also could occur over the short term in association with construction activities that emit exhaust and dust that could affect local and regional air quality. The CPHP EIR will include an evaluation of the potential for the proposed project to conflict with the local clean air plan.

b) Construction and operation of development projects under the proposed CPHP would generate air pollutants that could be considerable in a regional, cumulative context. The CPHP EIR will include an evaluation of the air quality impacts that could result from pollutant emissions related to implementation of the CPHP for which the air basin is in nonattainment of the ambient air quality standards.

c, e) Construction and operation of development under the proposed CPHP could expose sensitive receptors on the campus site and in adjacent residential neighborhoods to substantial pollutant concentrations (including toxic air contaminants). The CPHP EIR will include an evaluation of the air quality impacts related to exposure of sensitive receptors to pollutant concentrations.

d) The proposed CPHP would not include development of land uses identified by BAAQMD as typically associated with odors, such as wastewater treatment plants, landfills, composting facilities, refineries, or chemical plants (BAAQMD, 2017). As the proposed CPHP would

not result in development that would be a potential source of odors, this topic will not be evaluated further in the CPHP EIR.

References

Bay Area Air Quality Management District (BAAQMD). 2017. *California Environmental Quality Act Air Quality Guidelines*. May.

5.4 Biological Resources

Issues (and Supporting Information Sources):		*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
IV.	**BIOLOGICAL RESOURCES —** Would the project:		
a)	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 the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☒	☐
b)	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☒
c)	Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒
d)	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?	☒	☐
e)	Conflict with any local policies or ordinances protecting biological resources?	☒	☐
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☒
g)	Exceed the LRDP EIR standard of significance by damaging or removing heritage or landmark trees or native oak trees of a diameter specified in a local ordinance?	☒	☐

Discussion

a) Construction and operational activities under the proposed CPHP that would be within or in the vicinity of the Reserve have the potential to adversely impact special-status wildlife species migratory birds, and bats inhabiting the Reserve forest through increased noise and visual disturbance. In addition, resident and migrating birds and bats could nest or roost in buildings within the Parnassus Heights campus site. Demolition of existing structures on the campus site, or removal of campus trees or other vegetation could result in the loss of nests or roosts, and construction of individual projects under the proposed CPHP could adversely impact resident and migratory birds or bats through increased noise and visual disturbance during building construction. These potential impacts will be analyzed and discussed further in the CPHP EIR.

b) Development under the proposed CPHP would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS as no riparian habitat or other sensitive natural community is mapped or identified within the campus site. While there is the potential for certain new development under the CPHP, including the proposed New Hospital and associated widening of Medical Center Way adjacent to the New Hospital, to result in the need to modify the Reserve boundary, the Reserve is largely comprised of non-native eucalyptus forest with a non-native understory (UCSF 2014; UCSF, 2018). No development under the proposed CPHP is planned within undeveloped areas of the Reserve where sensitive habitats are present; thus, there would be no impacts on riparian or sensitive

habitats. No impact would occur, and this topic will not be evaluated further in the CPHP EIR.

c) Development at the Parnassus Heights campus site under the proposed CPHP would not have a substantial adverse effect on State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means as there are no jurisdictional or non-jurisdictional wetlands mapped or identified within the campus site. The only wetland feature on the Parnassus Heights campus site is an intermittent stream (Woodland Creek) that is located in the Reserve. The stream originates on the eastern slope of Mount Sutro and flows into the City's Interior Greenbelt to the east. However, as no development is proposed in this portion of the Reserve, this wetland feature would not be affected by development under the proposed CPHP. No impact would occur, and this topic will not be evaluated further in the CPHP EIR.

d) The Reserve contains suitable habitat for resident and migrating birds moving along the Pacific Flyway due to its expanse of mature trees and dense understory isolated within an urban setting. In addition, given the heights of new structures proposed under the proposed CPHP, development under the proposed CPHP could result in an increase in bird collisions with buildings on the campus site. These potential impacts will be analyzed and discussed further in the CPHP EIR.

e) Pursuant to the University of California's constitutional autonomy, development and uses on property under the control of the University that are in furtherance of the University's educational purposes are not subject to local land use regulation, including City of San Francisco General Plan policies regarding the protection of urban biological resources. Although UCSF is not subject to local standards, UCSF will strive to be consistent with the standards, where feasible. Potential conflicts of any off-site improvements that may occur under the CPHP with the San Francisco Urban Forestry Ordinance, however, will be discussed [see topic (g), below].

f) There are no adopted habitat conservation plans, natural community conservation plans, or other applicable habitat conservation plan that would be applicable to development under the proposed CPHP. No impact would occur, and this topic will not be analyzed in the CPHP EIR.

g) The San Francisco Urban Forestry Ordinance (Article 16 of the San Francisco Public Works Code) was enacted to ensure the protection of trees on private land within and adjacent to public areas. The City of San Francisco currently considers street trees, significant trees, and landmark trees as protected. Significant trees are trees within 10 feet of the public right-of-way and are either 20 feet or greater in height, 15 feet or greater in canopy width, or 12 inches or greater in trunk diameter at 4.5 feet above grade. Landmark trees are trees that have received special designation by the San Francisco Board of Supervisors due to species rareness, size, age, structure, ecological contribution, or historical and cultural importance. Although development and uses on property under the control of the University that are in furtherance of the University's educational purposes are not subject to local land use

regulation, development under the proposed CPHP could affect protected trees, and the potential impact will be analyzed and discussed further in the CPHP EIR.

References

University of California, San Francisco (UCSF). 2014. *UCSF 2014 Long Range Development Plan Final Environmental Impact Report*. November.

UCSF. 2018. *UCSF Vegetation Management Plan for the Mount Sutro Open Space Reserve Final Environmental Impact Report*. March.

5.5 Cultural Resources

Issues (and Supporting Information Sources):		*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
V.	**CULTURAL RESOURCES —** Would the project:		
a)	Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☒	☐
b)	Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☒	☐
c)	Disturb any human remains, including those interred outside of formal cemeteries?	☒	☐

Discussion

a) The Parnassus Heights campus site is the oldest of the UCSF campus sites, having begun in 1896 as the Affiliated Colleges, and contains numerous buildings and structures that are listed in, or are eligible for listing in, the California Register of Historical Resources (CRHR) (UCSF, 2014). Demolition and renovation of structures proposed as part of the proposed CPHP have the potential to demolish or materially alter in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for inclusion in, the CRHR. This potential impact will be analyzed and discussed further in the CPHP EIR.

b) Previous studies and archival research conducted for the Parnassus Heights campus site have not identified archaeological resources at the site. Archaeological sites are generally located near watercourses or water bodies, and the Parnassus Heights campus site is not such a setting. Additionally, this campus site has been extensively modified over time, and the likelihood of discovering prehistoric archaeological resources is low (UCSF, 2014). However, given the substantial new site alteration and excavation that would occur under the proposed CPHP, the potential for uncovering archaeological resources, including historical period resources, cannot be entirely discounted. The CPHP EIR will analyze the effects of the proposed CPHP on archaeological resources.

c) There are no known human remains, including those interred outside of formal cemeteries located at the Parnassus Heights campus site (UCSF 2014). However, the potential for uncovering human remains cannot be entirely discounted. The CPHP EIR will analyze the effects of the proposed CPHP on human remains.

References

University of California, San Francisco (UCSF). 2014. *UCSF 2014 Long Range Development Plan Final Environmental Impact Report*. November.

5.6 Energy

Issues (and Supporting Information Sources):		*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
VI.	**ENERGY —** Would the project:		
a)	Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☒	☐
b)	Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☒	☐

Discussion

a) Construction and operation of individual projects under the proposed CPHP would require the use of refined fossil fuels, primarily gasoline and diesel. Construction activities would require the short-term use of heavy-duty construction equipment that would run on diesel fuel or electricity. Gasoline would be required primarily to fuel construction-worker automobiles to commute to and from the construction sites. Once operational, development under the proposed CPHP would generate new long-term automobile and truck trips that would require the use of gasoline and diesel fuel. Operation of the proposed CPHP development projects would also result in energy consumption that could increase the natural gas demand of the Central Utility Plant. Natural gas consumption could also increase relative to increased space heating. Potential effects related to wasteful, inefficient, or unnecessary consumption of energy resources will be analyzed in the CPHP EIR.

b) Individual projects under the proposed CPHP would be required to comply with the *UC Policy on Sustainable Practices*, which requires that new construction meet a minimum standard of LEED-NC Silver and strive for LEED-NC Gold when possible and requires 20 percent better energy performance than Title 24 (and strives to achieve 30 percent). While new development under the proposed CPHP is not expected to conflict with the University's policy, this potential impact will be analyzed in the CPHP EIR.

5.7 Geology and Soils

Issues (and Supporting Information Sources):	*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
VII. GEOLOGY AND SOILS — Would the project:		
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:		
i) 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? Refer to Division of Mines and Geology Special Publication 42.	☐	☒
ii) Strong seismic ground shaking?	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☒	☐
iv) Landslides?	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☒	☐
c) 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?	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☒	☐
g) Exceed the LRDP EIR standard of significance by exposing people to structural hazards in an existing building rated Level V (Poor), or Level VI (Very Poor), under the University's seismic performance rating system, or substantial nonstructural hazards?	☐	☒

Discussion

a.i) The Parnassus Heights campus site is located on a bedrock outcrop of the Franciscan Complex, a mix of chert, greenstone, meta-sandstone and shale. The Parnassus Heights campus site is not located within or immediately adjacent to an active fault trace (i.e., Alquist-Priolo Earthquake Fault zone) and as a result is considered to have a very low potential for fault rupture (Jennings, 2010). No impact would occur, and this topic will not be analyzed in the CPHP EIR.

a.ii) The entire City of San Francisco, including the Parnassus Heights campus site, is located in a very seismically active area with a high probability of experiencing a substantial earthquake in the future. Development under the proposed CPHP could put people or structures at risk of loss, injury, or death involving strong seismic ground shaking. The CPHP EIR will assess the potential for the proposed CPHP to directly or indirectly cause substantial adverse effects resulting from strong seismic ground shaking.

a.iii) The Parnassus Heights campus site is mapped as having a low risk of liquefaction from seismic ground shaking (ABAG, 2019). However, development under the proposed CPHP could expose people or structures to loss, injury, or death due to seismic-related ground

failure, including liquefaction. The CPHP EIR will assess the potential for the proposed CPHP to directly or indirectly cause substantial adverse effects resulting from seismic-related ground failure.

a.iv) A number of sites within the Parnassus Heights campus site have the potential for future slope movement (Rutherford & Chekene 2019). As a result, development under the proposed CPHP could result in exposure of persons or structures to loss, injury, or death due to landslides. The CPHP EIR will assess the potential for the proposed CPHP to directly or indirectly cause substantial adverse effects resulting from landslides.

b) Development under the proposed CPHP could potentially change drainage patterns that could lead to substantial soil erosion or the loss of topsoil. The CPHP EIR will assess the potential for the proposed CPHP to result in substantial soil erosion and loss of topsoil from land development activities.

c) The Parnassus Heights campus site is located on geologic units and soils that could become unstable as a result of land development activities under the proposed CPHP. The CPHP EIR will assess the potential for the proposed CPHP to result in substantial harm due to geologic and soil instability, including on- or off-site landslides, lateral spreading, subsidence, liquefaction, or collapse.

d) Expansive soils are defined as those that shrink when dry and swell when moist; they typically contain a high proportion of clay particles. In general, expansive soils are commonly addressed in the evaluation of onsite geotechnical hazards, and past geotechnical investigations at the campus site has not revealed the presence of expansive soils. Furthermore, the University requires all new facilities to adhere to the current California Building Code (CBC), which includes detailed provisions to ensure that the design of new facilities is appropriate to site soil conditions, including requirements to address expansive and otherwise problematic soils. With adherence to the CBC, impacts related to site soil conditions – including but not limited to expansive soils, if any are present – would be less than significant, and this topic will not be evaluated further in the CPHP EIR.

e) The proposed CPHP does not propose any activities that would require the utilization of septic systems or alternative wastewater disposal systems. Therefore, there are no anticipated adverse effects from wastewater disposal associated with development under the proposed CPHP and this topic will not be analyzed in the CPHP EIR.

f) Review of geological maps and previous analysis suggests that there no unique paleontological resources or unique geologic features at the Parnassus Heights campus site, which is underlain by dune sands (UCSF, 2014). However, the potential for uncovering paleontological resources cannot be entirely discounted. The CPHP EIR will analyze the effects of the proposed CPHP on paleontological resources.

g) None of the structures planned for renovation under the proposed CPHP would expose people to structural hazards in buildings rated Level V (Poor), or Level VI (Very Poor)

under the University's seismic performance rating system for structural hazards. No impact would occur, and this topic will not be analyzed in the CPHP EIR.

References

Association of Bay Area Governments (ABAG), 2019. Liquefaction Study Zones and Liquefaction Susceptibility, http://gis.abag.ca.gov/website/Hazards/?hlyr=cgsLiqZones, accessed September 3, 2019.

Jennings C. W. 2010. 2010 Fault Activity Map of California.

Rutherford & Chekene. 2019. New Campus-Wide Slope Stability Risk Assessment, University of California San Francisco, Parnassus Campus, San Francisco, California. March 29.

University of California, San Francisco (UCSF). 2014. *UCSF 2014 Long Range Development Plan Final Environmental Impact Report*. November.

5.8 Greenhouse Gas Emissions

Issues (and Supporting Information Sources):	*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
VIII. GREENHOUSE GAS EMISSIONS — Would the project:		
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☒	☐

Discussion

a, b) Construction and operation of campus development under the proposed CPHP would generate greenhouse gas (GHG) emissions that could result in a potentially significant impact. The CPHP EIR will estimate the direct and indirect GHG emissions from development under the proposed CPHP and discuss whether the emissions would exceed the BAAQMD's recommended threshold for GHGs emitted by land use development projects. The CPHP EIR will also estimate and report GHG emissions that would be generated during construction of development under the proposed CPHP. In addition, the CPHP EIR will discuss any conflicts that development under the proposed CPHP may have with UCSF's Climate Action Plan and applicable state regulations such as Assembly Bill 32, Executive Order B-30-15, Senate Bill 350, and Senate Bill 32.

5.9 Hazards and Hazardous Materials

Issues (and Supporting Information Sources):		*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
IX.	**HAZARDS AND HAZARDOUS MATERIALS —** Would the project:		
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☒	☐
b)	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☒	☐
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☒	☐
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☒	☐
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☒
f)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☒
g)	Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires.	☐	☒

Discussion

a) Although small quantities of hazardous materials would be used on the site of each individual project contemplated by the proposed CPHP during construction, compliance with local, state, and federal regulations would minimize risks associated with the routine transport, use, or disposal of hazardous materials. However, during operation the proposed CPHP would include an increase in research and clinical uses on the campus site that could involve the routine use, transport, or disposal of hazardous materials, including hazardous chemical, radioactive, and biohazardous materials and research animals. The CPHP EIR will evaluate potential effects that could arise through the routine transport, use, or disposal of hazardous materials during operation of campus facilities developed pursuant to the proposed CPHP.

b) Demolition and renovation of structures under the proposed CPHP would disturb older structures and improvements where hazardous building materials such as asbestos, lead-based paint (LBP), polychlorinated biphenyls (PCBs), and mercury may be present (UCSF, 2014). If present, demolition and renovation activities could disturb these materials, thus resulting in potentially adverse effects to workers and the public. In addition, San Francisco is among the identified counties where ultramafic bedrock materials are present and have the potential for naturally occurring asbestos fibers, which could be encountered during excavation activities (UCSF, 2014). If present, groundbreaking activities could disturb these fibers causing them to become airborne, thus resulting in potentially adverse effects to workers and the public. The CPHP EIR will evaluate potential effects that could arise from the inadvertent release of hazardous materials into the environment during construction activities associated with development under the proposed CPHP.

c) There are two child care centers currently operating within the campus site (Kirkham Child Development Center and UCSF Marilyn Reed Lucia Child Development Center). There are also several public schools (Independence High School, Grattan Elementary School and Clarendon Alternative Elementary School) and private child care centers located within a quarter mile of the Parnassus Heights campus site boundary. Demolition and replacement of the structures on the Aldea Housing complex site could result in hazardous emissions due to the presence of hazardous building materials. The CPHP EIR will evaluate potential effects that could arise due to hazardous emissions or the handling of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

d) Two cases for the Parnassus Heights campus site found on the Geotracker database maintained by the State Water Resources Control Board were closed in accordance with applicable regulatory agency oversight, with no further action required (SWRCB 2019a; SWRCB 2019b). However, given the routine use of hazardous materials on the campus site, it is possible that unknown contamination may be present on other portions of the campus site. The CPHP EIR will evaluate potential hazards to the public or the environment from potential contamination on the campus site.

e) There are no public use airports within two miles of the City of San Francisco. San Francisco International Airport and Oakland International Airport are over eight and 12 miles from the campus site, respectively. No impact would occur, and this topic will not be discussed in the CPHP EIR.

f) Individual projects and proposed improvements contemplated by the proposed CPHP would be required to ensure that the street system can accommodate emergency response and evacuation. All projects and improvements would be designed to ensure appropriate emergency access to and egress from all areas. Additionally, all project-specific designs, including private internal circulation and building site plans, would be subject to review and approval by the State Fire Marshall for emergency response and evacuation concerns. UCSF design criteria and existing emergency response requirements are sufficient to ensure that the potential health and safety effects resulting from possible impairment or interference with any emergency response or evacuation plans would remain less than significant, and this topic will not be analyzed in the CPHP EIR.

g) According to CAL FIRE's Fire Hazard Severity Zone Map of San Francisco County, the Reserve is designated as Local Responsibility Area (LRA) moderate fire hazard severity zone (CAL FIRE, 2007). In September 2018, UCSF began implementing the Mount Sutro Open Space Reserve Vegetation Management Plan, a 20-year phased plan covering the management of the Reserve. Implementation of the vegetative management plan would change fire hazards and fire behavior within the Reserve, and fire hazards within the Reserve would generally decrease as a result of vegetation management activities, such as creating defensible space, removing diseased and/or dead trees, and increasing the diversity of tree types (UCSF 2018). The remainder of the Parnassus Heights campus site is not located within a fire hazard severity zone. The Vegetation Management Plan would mitigate the wildfire risk to new development under the CPHP, and consequently, the impact associated with the

exposure of people or structures developed under the proposed CPHP, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires would be less than significant. This topic will not be analyzed in the CPHP EIR.

References

California Department of Forestry and Fire Protection (CAL FIRE). 2007. Draft Fire Hazard Severity Zones in LRA – San Francisco County. October 5.

State Water Resources Control Board (SWRCB). 2019a. Geotracker database, http://geotracker. waterboards.ca.gov/map/?CMD=runreport&myaddress=315+Parnassus+Avenue. Accessed August 21, 2019.

SWRCB. 2019b. Geotracker database, http://geotracker. waterboards.ca.gov/map/?CMD=runreport&myaddress=50+Medical+Center+Way. Accessed August 21, 2019.

University of California, San Francisco (UCSF). 2018. *UCSF Vegetation Management Plan for the Mount Sutro Open Space Reserve Final EIR*. March.

5.10 Hydrology and Water Quality

Issues (and Supporting Information Sources):		*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
X.	**HYDROLOGY AND WATER QUALITY —** Would the project:		
a)	Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☒	☐
b)	Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☒
c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:		
	i) result in substantial erosion or siltation on- or off-site;	☒	☐
	ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☒	☐
	iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☒	☐
	iv) impede or redirect flood flows?	☒	☐
d)	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☒
e)	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☒	☒

Discussion

a) The majority of surface water runoff from the Parnassus Heights campus site is directed to the City's combined sewer system (CSS) that conveys flows to both the City's Oceanside Treatment Plant at Ocean Beach on the City's western shoreline and the Southeast Treatment Plant at Hunters Point on the City's eastern waterfront. Both treatment plants have a permit from the National Pollutant Discharge Elimination System (NPDES) program administered by the San Francisco Regional Water Quality Control Board (RWQCB) that regulates discharge from the plant to the Pacific Ocean. As discussed above in Section 5.7, *Geology and Soils*, development under the proposed CPHP could potentially generate surface water runoff that could lead to substantial soil erosion or the loss of topsoil during construction. Development under the proposed CPHP could also potentially generate surface water runoff with elevated levels of sediment and urban contaminants such as oil, grease, metals, pesticides, herbicides and entrained dust during operation. The CPHP EIR will evaluate potential impacts related to water quality during both construction and operation of campus development under the proposed CPHP.

b) Portions of the Parnassus Heights campus site where development under the proposed CPHP would occur are currently under impervious surfaces. Development under the proposed CPHP could result in an increase in impervious surfaces but not enough to interfere with groundwater recharge. In addition, dewatering during construction may be required. However, dewatering activities would be temporary and would not result in a long-term lowering of the local water table. Finally, development under the proposed CPHP

would not require the use of groundwater during construction or operation. For these reasons, development under the proposed CPHP would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge, and this topic will not be discussed in the CPHP EIR.

c.i) The Parnassus Heights campus site is located within both the Sunset watershed basin which drains to the Pacific Ocean and the Channel watershed basin, which drains to the bay. Development under the proposed CPHP would primarily occur within the developed portions of the campus site. Development under the proposed CPHP would change drainage patterns on the Parnassus Heights campus site that could potentially result in erosion and siltation off-site downstream within the Sunset and Channel drainage basins. The CPHP EIR will evaluate potential impacts related to increased erosion and siltation.

c.ii) Development under the proposed CPHP would change drainage patterns on the campus site that could potentially result in flooding on- or off-site downstream within either the Sunset of Channel drainage basins. The CPHP EIR will evaluate potential impacts related to flooding on- or off-site.

c.iii) Development under the proposed CPHP could potentially result in additional sources of polluted runoff during demolition or construction. As discussed under item (a) above, the CPHP EIR will evaluate potential impacts to water quality from stormwater runoff.

c.iv) An intermittent stream (Woodland Creek) is located in the Reserve. The stream originates on the eastern slope of Mount Sutro and flows into the City's Interior Greenbelt to the east. No other water features are located on the Parnassus Heights campus site. Development under the proposed CPHP would increase the amount of impervious surfaces on the Parnassus Heights campus site, which could impede or redirect flood flows. However, the proposed CPHP would not impede or redirect flood flows in Woodland Creek as no development would occur in that portion of the Reserve. The CPHP EIR will evaluate potential impacts related to the impediment or redirection of flood flows on other portions of the campus site.

d) The campus site is not located within a 100-year flood zone (SFWPS, 2019). In addition, with an elevation ranging from 300 to 900 feet, the campus site has no potential to be affected by future sea level rise (CCSF 2016). Finally, due to its elevation and inland location, and its distance from the nearest major body of water, the campus site is not susceptible to the potential effects of a tsunami or seiche (CalEMA 2009). No impact would occur, and no additional analysis is required.

e) Water quality in the City and County of San Francisco is regulated by the San Francisco RWQCB through the Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin. As discussed under item (a) above, development under the proposed CPHP could negatively impact water quality during construction and operation. The CPHP EIR will evaluate potential conflicts with the Basin Plan.

The project site is located in the Westside groundwater basin. The basin has not been identified as a medium- or high-priority groundwater basin by the California Department of Water Resources (DWR, 2019); therefore, a Groundwater Sustainability Plan (GSP) does not need to be prepared for the basin per the requirements of the Sustainable Groundwater Management Act (SGMA). Thus, development under the proposed CPHP would not conflict with a sustainable groundwater management plan, no impact would occur, and no additional analysis is required.

References

San Francisco Water Power Sewer (SFWPS). 2019. 100-Year Storm Flood Risk Map, http://www.sfwater.org/index.aspx?page=1229. Accessed August 27, 2019.

City and County of San Francisco (CCSF). 2016. *San Francisco Sea Level Rise Action Plan.* March.

California Department of Water Resources (DWR). 2019. Basin Prioritization, https://water.ca.gov/Programs/ GroundwaterManagement/Basin-Prioritization. Accessed August 28, 2019.

California Emergency Management Agency (CalEMA). 2009. Tsunami Inundation Map for Emergency Planning, State of California – City and County of San Francisco, San Francisco North Quadrangle, San Francisco South Quadrangle (Pacific Coast). June 15.

5.11 Land Use and Planning

Issues (and Supporting Information Sources):		*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
XI.	**LAND USE AND PLANNING —** Would the project:		
a)	Physically divide an established community?	☐	☒
b)	Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☒	☐
c)	Exceed an LRDP EIR standard of significance by conflicting with local land use regulations such that a significant incompatibility is created with adjacent land uses?	☒	☐

Discussion

a) No development outside of the established campus boundary is proposed, and no intrusion into, or division of, surrounding residential communities would occur under the proposed CPHP. The Parnassus Heights campus site would continue to remain as a distinct entity, consisting of educational and medical land uses that are woven into the fabric of the surrounding neighborhood, and the boundary of the campus site would not change as a result of the proposed CPHP. While the extension of Fourth Avenue under the proposed CPHP would add a new roadway on the Parnassus Heights campus site, this extension would occur entirely within the campus site boundaries and would not affect the surrounding neighborhood. No impact would occur, and no additional analysis is required.

b) The 2014 LRDP is the current applicable land use plan for the Parnassus Heights campus site through 2035. The CPHP EIR will evaluate the consistency of the proposed CPHP with the 2014 LRDP.

c) Land within the City and County of San Francisco's jurisdiction is subject to plans, policies and zoning controls that regulate future development proposals and mitigate certain environmental effects. UCSF is not subject to local land use regulations whenever using property under its control in furtherance of its education mission, however, the CPHP EIR will evaluate the potential for growth under the proposed CPHP to directly or indirectly conflict with City plans, policies and zoning controls such that a significant incompatibility is created with adjacent land uses.

5.12 Mineral Resources

Issues (and Supporting Information Sources):	*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
XII. MINERAL RESOURCES — Would the project:		
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☒

Discussion

a, b) The Parnassus Heights campus site is not located in an area of known mineral resources. In addition, the campus site does not contain a locally important mineral resource recovery site. Therefore, no impact would occur, and this topic will not be analyzed in the CPHP EIR.

5.13 Noise

Issues (and Supporting Information Sources):		*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
XIII.	**NOISE —** Would the project result in:		
a)	Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☒	☐
b)	Generation of excessive groundborne vibration or groundborne noise levels?	☒	☐
c)	For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☒
d)	Exceed an LRDP EIR standard of significance by contributing to an increase in average daily noise levels (Ldn) of 3 dB(A) or more at property lines, if ambient noise levels in areas adjacent to proposed development already exceed local noise levels set forth in local general plans or ordinances for such areas based on their use?	☒	☐

Discussion

a) Development under the proposed CPHP could result in increases or changes in noise levels from sources such as construction activities, stationary sources, and increased vehicular traffic, which could exceed applicable noise standards. The CPHP EIR will evaluate the potential for development under the proposed CPHP to expose sensitive receptors to noise in excess of applicable standards.

b) Demolition and construction activities that would occur under the proposed CPHP would generate perceptible groundborne vibration levels when heavy equipment or impact tools are used. Structures, researchers and residents in the proximity of the Parnassus Heights campus site could be adversely affected by groundborne vibration and groundborne noise generated during the construction of campus development projects under the proposed CPHP. These potential impacts will be assessed in the CPHP EIR.

c) There are no public use airports within two miles of the City of San Francisco. San Francisco International Airport and Oakland International Airport are over eight and 12 miles from the campus site, respectively, and therefore well outside of the area of influence identified in their respective airport land use compatibility plans. Consequently, there would be a less than significant impact with regard to exposure to excessive noise levels from public use airports, and this topic will not be analyzed in the CPHP EIR.

d) Modeled noise levels in the vicinity of the campus site are above 70 dB(A) Ldn along the Parnassus Avenue and Irving Street frontages (San Francisco 2009). While operation of individual projects under the proposed CPHP is not expected to contribute to an increase in average daily noise levels of 3 dB(A) Ldn or more at property lines in an area where ambient noise levels already exceed local noise levels set forth in City's General Plan, as that would require the projects to result in a doubling of traffic in the area, this potential impact will be analyzed in the CPHP EIR. In addition, there will likely be some new mechanical equipment (e.g. heating ventilation and air conditioning) associated with the operation of new

development on the Parnassus Heights campus site under the proposed CPHP. The potential impact of noise from these stationary sources will also be analyzed in the CPHP EIR.

References

City and County of San Francisco (CCSF). 2009. *San Francisco General Plan Environmental Protection Element*.

5.14 Population and Housing

Issues (and Supporting Information Sources):		*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
XIV. POPULATION AND HOUSING — Would the project:			
a)	Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☒	☐
b)	Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☒	☐
c)	Exceed the LRDP EIR standard of significance by creating a demand for housing outside the market area where the facilities or site are located?	☒	☐

Discussion

a) The proposed CPHP would result in population growth on the Parnassus Heights campus site through increased employment, student enrollment, patients, and visitors. The proposed CPHP would accommodate an increase in campus population from approximately 17,400 under existing conditions to approximately 25,300 by the year 2050. In addition, the proposed CPHP would increase the number of housing units in the Aldea housing complex on the campus site from 172 units to 504 units (a net increase of 332 units), and would add an additional 430 units as part of the West Side Housing project on the campus site. The CPHP EIR will evaluate the potential for the proposed CPHP to induce substantial unplanned population growth in the San Francisco Bay Area.

b) The demolition and replacement of existing housing in the Aldea housing complex would temporarily displace UCSF residents from those residences. It is the intent of UCSF to relocate residents to alternative campus housing locations for the duration of construction. However, it is possible that alternative campus housing will not be available. As a result, the temporary displacement of Aldea housing residents may necessitate the construction of replacement housing elsewhere in the City. The CPHP EIR will evaluate the potential for the proposed CPHP to displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

c) The proposed CPHP would result in population growth in the San Francisco Bay Area through increased employment and student enrollment. The proposed CPHP would accommodate an increase in campus population from approximately 17,400 under existing conditions to approximately 25,300 by the year 2050. This anticipated population increase could result in an increased demand for housing in the Bay Area. The CPHP EIR will evaluate the potential for the proposed CPHP to create demand for housing.

5.15 Public Services

Issues (and Supporting Information Sources):		*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
XV. PUBLIC SERVICES —			
a)	Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:		
i)	Fire protection?	☒	☐
ii)	Police protection?	☐	☒
iii)	Schools?	☒	☐
iv)	Parks?	☒	☐
v)	Other public facilities?	☐	☒

Discussion

a.i) The San Francisco Fire Department (SFFD) provides fire protection and emergency services to the Parnassus Heights campus site. The nearest fire station is Station No. 12, located about a quarter mile from the campus site at 1145 Stanyan Street. Development under the proposed CPHP would have the potential to increase the demand for fire protection services, and potentially result in the need for new or altered fire station facilities. This impact will be evaluated in the CPHP EIR.

a.ii) The UC Police Department (UCPD) provides police protection services to the Parnassus Heights campus site. The UCPD is headquartered at 654 Minnesota Street, approximately four miles from the campus site. The UCPD also operates a patrol station at the Parnassus Heights campus site. The increase in daily population at the Parnassus Heights campus site under the proposed CPHP would increase demand on UCPD services. It is UCPD's practice to review staffing levels and to provide necessary staffing to meet standard response times (less than 3 min for emergency/in-progress calls and less than 5 min for normal service). New staffing required to serve the increase in daily population as a result of the proposed CPHP would either be accommodated by existing facilities or within new facilities that are covered under the building space envelope being analyzed in the CPHP EIR. The UCPD also has a mutual-aid agreement with the San Francisco Police Department (SFPD) to provide cooperative assistance within a 1-mile radius of the Parnassus Heights campus site. However, the SFPD is generally only called where an unusual need for assistance is required. As a result, daily campus population growth under the proposed CPHP is not anticipated to substantially increase demand on SFPD services. For these reasons, impacts to police protection services would be less than significant, and this topic will not be analyzed in the CPHP EIR.

a.iii) The City's public schools are operated by the San Francisco Unified School District (SFUSD). Public schools serving the area around the Parnassus Heights campus site include Alice Fong Yu Alternative School (grades K-8) at 1541 12th Avenue, Clarendon

Alternative Elementary School (K-5) at 500 Clarendon Avenue, Grattan Elementary School (grades K-5) at 165 Grattan Street, Everett Middle School (grades 6-8) at 450 Church Street, Independence High School (grades 9-12) at 1350 7th Avenue, and Mission High School (grades 9-12) at 3750 18th Street. Development under the proposed CPHP would alter the demand for public school services and therefore this topic will be evaluated in the CPHP EIR.

a.iv) Effects on local and regional parks are discussed in Section 5.16, *Recreation*, below.

a.v) Campus development under the proposed CPHP would not affect any other public facilities. No impact would occur, and this topic will not be analyzed in the CPHP EIR.

5.16 Recreation

Issues (and Supporting Information Sources):		*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
XVI. RECREATION —			
a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☒	☐
b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☒	☐

Discussion

a) Several public parks are located within a quarter mile of the Parnassus Heights campus site, including Golden Gate Park, which is located one block north of the campus site. The additional campus population under the proposed CPHP would result in an increased demand for recreational facilities. This impact will be evaluated in the CPHP EIR.

b) The proposed CPHP would result in construction of a various new recreational facilities at the campus site. This impact will be evaluated in the CPHP EIR.

5.17 Transportation

Issues (and Supporting Information Sources):	*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
XVII. TRANSPORTATION — Would the project:		
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☒	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☒	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☒	☐
d) Result in inadequate emergency access?	☒	☐

Discussion

a) Although UCSF is not subject to local land use regulation whenever using property under its control in furtherance of its educational mission, the CPHP EIR will evaluate the potential for development under the proposed CPHP to conflict with programs, plans, ordinances, and policies addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.

b) Development under the proposed CPHP would increase both the amount of building space on the Parnassus Heights campus site and the daily population, which would result in increased vehicle trips to and from the campus site. This increase in trips would in turn increase the total amount of vehicle miles traveled (VMT) to and from the campus site. The CPHP EIR will evaluate the potential for development under the proposed CPHP to conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).

c) Although development under the proposed CPHP is not expected to include hazardous roadway design features or incompatible uses, the potential for impacts related to site access will be evaluated in the CPHP EIR.

d) Although development under the proposed CPHP is not expected to result in inadequate emergency access, this issue will be evaluated in the CPHP EIR.

5.18 Tribal Cultural Resources

Issues (and Supporting Information Sources):	*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
XVIII. TRIBAL CULTURAL RESOURCES —		
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:		
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources. Code Section 5020.1(k), or	☒	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☒	☐

Discussion

a.i-ii) As discussed in Section 5.5, *Cultural Resources*, above, no prehistoric archaeological resources have been identified on the Parnassus Heights campus site. In addition, the likelihood of discovering intact prehistoric archaeological resources on the campus site is low as it has been extensively modified over time. For these reasons, the potential for the Parnassus Heights campus site to contain tribal cultural resources is also low. However, given the substantial site alteration and excavation that would occur under the proposed CPHP, the potential for uncovering or disturbing tribal cultural resources cannot be entirely discounted. As discussed under Section 1, *Project Information*, consistent with AB 52, UCSF contacted the applicable representatives for several local Native American tribes regarding UCSF's proposal to undertake the CPHP, however, no responses were received from the tribes. The CPHP EIR will analyze the effects of the proposed CPHP on tribal cultural resources.

5.19 Utilities and Service Systems

Issues (and Supporting Information Sources):		*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
XIX. UTILITIES AND SERVICE SYSTEMS — Would the project:			
a)	Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☒	☐
b)	Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☒	☐
c)	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☒	☐
d)	Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☒	☐
e)	Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☒	☐

Discussion

a) Development under the proposed CPHP could require or result in relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities. The CPHP EIR will evaluate whether the construction or relocation of these facilities would cause significant environmental effects.

b) The San Francisco Public Utilities Commission (SFPUC) provides regional water services to approximately 2.6 million people in San Francisco, Santa Clara, Alameda, San Mateo, and Tuolumne Counties, including all of the City and County of San Francisco. About 85 percent of the water delivered to SFPUC customers comes from the Tuolumne River watershed stored in Hetch Hetchy Reservoir in the Sierra Nevada, and the remaining 15 percent comes from runoff in the Alameda and Peninsula watersheds captured in reservoirs located in San Mateo and Alameda Counties, supplemented with local groundwater and recycled water. Development under the proposed CPHP would require additional water supplies, and the CPHP EIR will evaluate whether the SFPUC would have sufficient water supplies to serve the projected campus development under the proposed CPHP and reasonably foreseeable future development during normal, dry, and multiple dry years.

c) The SFPUC maintains and operates the City's combined sewer system (CSS) that serves most of San Francisco, including the Parnassus Heights campus site. Wastewater generated on the Parnassus Heights campus site would enter the CSS and would be treated at the City's Oceanside Treatment Plant (only storm water generated on the east portion of the campus site would be treated at the City's Southeast Treatment Plant). Development under the proposed CPHP could result in the need for additional wastewater treatment capacity at the Oceanside Treatment Plant, and the CPHP EIR will evaluate whether the Oceanside Treatment Plant has adequate capacity to serve projected demand under the proposed CPHP in addition to current and future demands.

d-e) Solid waste generated on the campus site is collected and hauled to a transfer station near Candlestick Point and recycled as feasible. The remaining waste is then sent to the Recology Hay Road Landfill in Solano County. The CPHP EIR will evaluate whether solid waste providers have the capacity to serve development under the proposed CPHP in addition to current and future demands. In addition, the CPHP EIR will evaluate whether the proposed project would conflict with federal, state, and local management and reduction statutes and regulations related to solid waste.

5.20 Wildfire

Issues (and Supporting Information Sources):	*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
XX. WILDFIRE — If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:		
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☒

Discussion

a-d) As discussed in Section 5.9, *Hazards and Hazardous Resources*, above, the Reserve is designated as LRA moderate fire hazard severity zone by CAL FIRE. Development under the proposed CPHP would not be located in or near a state responsibility area or land classified as a very high fire hazard severity zone. In addition, with implementation of the vegetation management practices listed in the Mount Sutro Open Space Reserve Vegetation Management Plan, the risk of wildland fires on the campus site is being minimized. Finally, individual projects and proposed improvements contemplated by the proposed CPHP would be required to ensure that the street system can accommodate emergency response and evacuation. All projects and improvements would be designed to ensure appropriate emergency access to and egress from all areas. No impact would occur, and this topic will not be analyzed in the CPHP EIR.

5.21 Mandatory Findings of Significance

Issues (and Supporting Information Sources):	*Impact to be Analyzed in CPHP EIR*	*No Additional Analysis Required*
XXI. MANDATORY FINDINGS OF SIGNIFICANCE —		
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐

Discussion

a) As indicated in the discussions above, campus development under the proposed CPHP has the potential to result in significant biological and cultural resource impacts, and substantially degrade the quality of the environment. The CPHP EIR will evaluate the potential for development under the proposed CPHP to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory.

b) The proposed CPHP would add approximately 2.9 million gsf of new clinical and academic space, support facilities, and student housing to the Parnassus Heights campus site. In addition, the proposed CPHP would increase campus population by approximately 7,900. The CPHP EIR will evaluate whether the potential impacts of development under the proposed CPHP, combined with other current projects and probable future projects and projected regional growth in the surrounding area, would be cumulatively considerable.

c) As indicated in the discussions of each topic above, development under the proposed CPHP has the potential to result in significant impacts. The CPHP EIR will evaluate whether any of those impacts have the potential to result in substantial adverse effects on human beings either directly or indirectly.

Appendix B
EIR Scoping Comments

Agency Letters

Organization Letters

Individual Letters

Scoping Meeting

Agency Letters

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Gavin Newsom
Governor

Kate Gordon
Director

Notice of Preparation

January 14, 2020

To: Reviewing Agencies

Re: University of California, San Francisco (UCSF) Comprehensive Parnassus Heights Plan
SCH# 2020010175

Attached for your review and comment is the Notice of Preparation (NOP) for the University of California, San Francisco (UCSF) Comprehensive Parnassus Heights Plan draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Diane Wong
University of California, Regents of the
UCSF Campus Planning, 654 Minnesota Street
San Francisco, CA 94143-0286

with a copy to the State Clearinghouse in the Office of Planning and Research at state.clearinghouse@opr.ca.gov . Please refer to the SCH number noted above in all correspondence concerning this project on our website: https://ceqanet.opr.ca.gov/2020010175/2.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

2020010175

Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P. O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

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Project Title: University of California, San Francisco (UCSF) Comprehensive Parnassus Heights Plan

Lead Agency: The Regents of the University of California | Contact Person: Diane Wong, UCSF

Mailing Address: UCSF Campus Planning, 654 Minnesota Street | Phone: (415) 502-5952

City: San Francisco | Zip: 94143-0286 | County: San Francisco

Project Location: County: San Francisco | City/Nearest Community: San Francisco

Cross Streets: Parnassus Avenue, generally between 5th Ave. and east of Medical Center Way; Irving Street at Arguello; Clarendon Ave. at Johnstone Drive | Zip Code: 94143

Lat. / Long. (degrees, minutes, and seconds): ____° ____' ____" N/ ____° ____' ____" W | Total Acres:

Assessor's Parcel No.: 2634A/011 & 005; 1849/054; 1850/001; 1758/043; 1757/035; 1756/001; 1275A/030

Section: -- | Twp.: -- | Range: -- | Base: --

Within 2 Miles: State Hwy #: CA Hwy 1 | Waterways: --

Airports: -- | Railways: Muni | Schools: SFUSD

Document Type:

CEQA: ☒ NOP ☐ Early Cons ☐ Neg Dec ☐ Mit Neg Dec ☐ Draft EIR ☐ Supplement/Subsequent EIR (Prior SCH No.) ☐ Other

NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI ☐ Other

Other: ☐ Joint Document ☐ Final Document ☐ Other

Governor's Office of Planning & Research

JAN 14 2020

STATE CLEARINGHOUSE

Local Action Type:

☐ General Plan Update ☐ General Plan Amendment ☐ General Plan Element ☐ Community Plan
☐ Specific Plan ☐ Master Plan ☐ Planned Unit Development ☐ Site Plan
☐ Rezone ☐ Prezone ☐ Use Permit ☐ Land Division (Subdivision, etc.)
☐ Annexation ☐ Redevelopment ☐ Coastal Permit ☒ Other UCSF CPHP

Development Type:

☐ Residential: Units ____ Acres ____
☐ Office: Sq.ft. ____ Acres ____ Employees ____
☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
☒ Educational 2.9 million gsf new building space, including clinical, research, educational, and housing
☐ Recreational
☐ Water Facilities: Type ____ MGD ____
☐ Transportation: Type ____
☐ Mining: Mineral ____
☐ Power: Type ____ MW ____
☐ Waste Treatment: ____ Type MGD ____
☐ Hazardous Waste: Type ____
☐ Other: ____

Project Issues Discussed in Document:

☒ Aesthetic/Visual
☒ Agricultural Land
☒ Air Quality
☒ Archeological/Historical
☒ Biological Resources
☐ Coastal Zone
☒ Drainage/Absorption
☒ Economic/Jobs
☐ Fiscal
☒ Flood Plain/Flooding
☒ Forest Land/Fire Hazard
☒ Geologic/Seismic
☒ Minerals
☒ Noise
☒ Population/Housing Balance
☒ Public Services/Facilities
☒ Recreation/Parks
☒ Schools/Universities
☐ Septic Systems
☒ Sewer Capacity
☒ Soil Erosion/Compaction/Grading
☒ Solid Waste
☒ Toxic/Hazardous
☒ Traffic/Circulation
☒ Vegetation
☒ Water Quality
☒ Water Supply/Groundwater
☒ Wetland/Riparian
☒ Growth Inducement
☒ Land Use
☒ Cumulative Effects
☐ Other: ____

Present Land Use/Zoning/General Plan Designation:

Development and land uses of the University of California, San Francisco (UCSF) are guided by the UCSF 2014 Long Range Development Plan (LRDP). UCSF is not subject to local zoning, but City of San Francisco zoning is identified below for informational purposes.

City of San Francisco Zoning Districts: P (Public), and Residential House District, Two-Familly (RH-2). City of San Francisco Height and Bulk Districts: 25-X, 40-X, 65-D, 80-D, 130-D, and 220-F.

Note: The state Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Revised 2010

NOP Distribution List

County: SAN FRANCISCO QR **SCH#** 2020010175

Resources Agency

- [x] **Resources Agency**
  Nadell Gayou
- [ ] **Dept. of Boating & Waterways**
  Denise Peterson
- [ ] **California Coastal Commission**
  Allyson Hitt
- [ ] **Colorado River Board**
  Elsa Contreras
- [ ] **Dept. of Conservation**
  Crina Chan
- [ ] **Cal Fire**
  Dan Foster
- [ ] **Central Valley Flood Protection Board**
  James Herota
- [x] **Office of Historic Preservation**
  Ron Parsons
- [x] **Dept of Parks & Recreation**
  Environmental Stewardship Section
- [x] **S.F. Bay Conservation & Dev't. Comm.**
  Steve Goldbeck
- [x] **Dept. of Water Resources**
  Resources Agency
  Nadell Gayou

Fish and Wildlife

- [ ] **Depart. of Fish & Wildlife**
  Scott Flint
  Environmental Services Division
- [ ] **Fish & Wildlife Region 1**
  Curt Babcock
- [ ] **Fish & Wildlife Region 1E**
  Laurie Harnsberger
- [ ] **Fish & Wildlife Region 2**
  Jeff Drongesen
- [x] **Fish & Wildlife Region 3**
  Craig Weightman
- [ ] **Fish & Wildlife Region 4**
  Julie Vance
- [ ] **Fish & Wildlife Region 5**
  Leslie Newton-Reed
  Habitat Conservation Program
- [ ] **Fish & Wildlife Region 6**
  Tiffany Ellis
  Habitat Conservation Program
- [ ] **Fish & Wildlife Region 6 I/M**
  Heidi Calvert
  Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Wildlife M**
  William Paznokas
  Marine Region

Other Departments

- [x] **California Department of Education**
  Lesley Taylor
- [x] **OES (Office of Emergency Services)**
  Monique Wilber
- [ ] **Food & Agriculture**
  Sandra Schubert
  Dept. of Food and Agriculture
- [x] **Dept. of General Services**
  Cathy Buck
  Environmental Services Section
- [x] **Housing & Comm. Dev.**
  CEQA Coordinator
  Housing Policy Division

Independent Commissions,Boards

- [ ] **Delta Protection Commission**
  Erik Vink
- [ ] **Delta Stewardship Council**
  Anthony Navasero
- [ ] **California Energy Commission**
  Eric Knight
- [x] **Native American Heritage Comm.**
  Debbie Treadway
- [x] **Public Utilities Commission**
  Supervisor
- [ ] **Santa Monica Bay Restoration**
  Guangyu Wang
- [x] **State Lands Commission**
  Jennifer Deleong
- [ ] **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Cal State Transportation Agency CalSTA

- [ ] **Caltrans - Division of Aeronautics**
  Philip Crimmins
- [ ] **Caltrans – Planning HQ LD-IGR**
  Christian Bushong
- [x] **California Highway Patrol**
  Suzann Ikeuchi
  Office of Special Projects

Dept. of Transportation

- [ ] **Caltrans, District 1**
  Rex Jackman
- [ ] **Caltrans, District 2**
  Marcelino Gonzalez
- [ ] **Caltrans, District 3**
  Susan Zanchi
- [x] **Caltrans, District 4**
  Patricia Maurice
- [ ] **Caltrans, District 5**
  Larry Newland
- [ ] **Caltrans, District 6**
  Michael Navarro
- [ ] **Caltrans, District 7**
  Dianna Watson
- [ ] **Caltrans, District 8**
  Mark Roberts
- [ ] **Caltrans, District 9**
  Gayle Rosander
- [ ] **Caltrans, District 10**
  Tom Dumas
- [ ] **Caltrans, District 11**
  Jacob Armstrong
- [ ] **Caltrans, District 12**
  Maureen El Harake

Cal EPA

Air Resources Board

- [ ] **Airport & Freight**
  Jack Wursten
- [ ] **Transportation Projects**
  Nesamani Kalandiyur
- [ ] **Industrial/Energy Projects**
  Mike Tollstrup
- [x] **California Department of Resources, Recycling & Recovery**
  Kevin Taylor/Jeff Esquivel
- [ ] **State Water Resources Control Board**
  Regional Programs Unit
  Division of Financial Assistance
- [ ] **State Water Resources Control Board**
  Cindy Forbes – Asst Deputy
  Division of Drinking Water
- [ ] **State Water Resources Control Board**
  Div. Drinking Water #_____
- [x] **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] **State Water Resouces Control Board**
  Phil Crader
  Division of Water Rights
- [x] **Dept. of Toxic Substances Control Reg. #**_____
  CEQA Tracking Center
- [ ] **Department of Pesticide Regulation**
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- [x] **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] **RWQCB 3**
  Central Coast Region (3)
- [ ] **RWQCB 4**
  Teresa Rodgers
  Los Angeles Region (4)
- [ ] **RWQCB 5S**
  Central Valley Region (5)
- [ ] **RWQCB 5F**
  Central Valley Region (5)
  Fresno Branch Office
- [ ] **RWQCB 5R**
  Central Valley Region (5)
  Redding Branch Office
- [ ] **RWQCB 6**
  Lahontan Region (6)
- [ ] **RWQCB 6V**
  Lahontan Region (6)
  Victorville Branch Office
- [ ] **RWQCB 7**
  Colorado River Basin Region (7
- [ ] **RWQCB 8**
  Santa Ana Region (8)
- [ ] **RWQCB 9**
  San Diego Region (9)

- [x] **Other** OSHPD
- [ ] _____
  Conservancy

Last Updated 5/22/18

STATE OF CALIFORNIA Gavin Newsom, *Governor*

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Pomo

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

January 15, 2020

Diane Wong
University of California, Regents of the
UCSF Campus Planning, 654 Minnesota Street
San Francisco, CA 94143-0286

Re: 2020010175, University of California, San Francisco (UCSF) Comprehensive Parnassus Heights Plan Project, San Francisco County

Dear Ms. Wong:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements.** If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

a. A brief description of the project.

b. The lead agency contact information.

c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).

d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

a. Alternatives to the project.

b. Recommended mitigation measures.

c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

a. Type of environmental review necessary.

b. Significance of the tribal cultural resources.

c. Significance of the project's impacts on tribal cultural resources.

d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

a. Whether the proposed project has a significant impact on an identified tribal cultural resource.

b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

a. Avoidance and preservation of the resources in place, including, but not limited to:

i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

i. Protecting the cultural character and integrity of the resource.

ii. Protecting the traditional use of the resource.

iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.

b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:

a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.

b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.

a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.

b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.

c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Nancy.Gonzalez-Lopez@nahc.ca.gov.

Sincerely,



Nancy Gonzalez-Lopez
Staff Services Analyst

cc: State Clearinghouse

DEPARTMENT OF TRANSPORTATION
DISTRICT 4
OFFICE OF TRANSIT AND COMMUNITY PLANNING
P.O. BOX 23660, MS-10D
OAKLAND, CA 94623-0660
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www.dot.ca.gov

Making Conservation a California Way of Life.

January 29, 2020

SCH #2020010175
GTS # 04-SF-2020-00303
GTS ID: 18365
SF/1/PM 3.61

Diane Wong, Principal Planner
UCSF Campus Planning
654 Minnesota Street
San Francisco, CA 94143-0286

University of California, San Francisco (UCSF) Comprehensive Parnassus Heights Plan – Notice of Preparation (NOP)

Dear Diane Wong:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the UCSF Comprehensive Parnassus Heights Plan. We are committed to ensuring that impacts to the State's multimodal transportation system and to our natural environment are identified and mitigated to support a safe, sustainable, integrated and efficient transportation system. The following comments are based on our review of the January 2020 NOP.

Project Understanding

The Regents of the University of California propose the Comprehensive Parnassus Heights Plan (CPHP), which is a conceptual, flexible plan to meet projected space needs for critical programs in research, patient care, and education at Parnassus Heights, while improving upon the aesthetic and functional design of the campus environment. The CPHP also includes opportunities for development of needed on-campus housing. The CPHP establishes a long-term development framework for the revitalization of the physical environment at Parnassus Heights, by identifying opportunity sites for new buildings and major renovations of existing buildings; candidate buildings for demolition; opportunities for development of open spaces; and opportunities for improvements to on-campus mobility and circulation. The CPHP includes an Initial Phase that primarily comprises: 1) Irving Street Arrival improvements, 2) Research and Academic Building, 3) Initial Aldea Housing Densification, and 4) New Hospital; as well as other Initial Phase activities. This phase is anticipated to be completed

by approximately year 2030. Beyond the Initial Phase, the "Future Phase" encompasses the remaining development described in the CPHP envisioned for completion by the horizon year of 2050. Regional access is provided from State Route (SR)-1 approximately 0.82-mile away.

Multimodal Planning

The project's primary and secondary effects on pedestrians, bicyclists, travelers with disabilities, and transit users should be evaluated, including countermeasures and trade-offs resulting from mitigating Vehicle Miles Traveled (VMT) increases. Access for pedestrians and bicyclists to transit facilities must be maintained. These smart growth approaches can be consistent with Metropolitan Transportation Commission's Regional Transportation Plan/Sustainable Communities Strategies and would help meet Caltrans Strategic Management Plan targets.

Vehicle Trip Reduction

Given the place, type and size of the project, it should include a robust Transportation Demand Management (TDM) Program to reduce VMT and greenhouse gas emissions. Such measures are critical to facilitating efficient site access. The measures listed below can promote smart mobility and reduce regional VMT.

- Project design to encourage walking, bicycling and transit access;
- Transit and trip planning resources such as a commute information kiosk;
- Real-time transit information system;
- Transit subsidies on an ongoing basis;
- Ten percent vehicle parking reductions;
- Charging stations and designated parking spaces for electric vehicles;
- Carpool and clean-fuel parking spaces;
- Designated parking spaces for a car share program;
- Unbundled parking;
- Showers, changing rooms and clothing lockers for employees that commute via active transportation;
- Emergency Ride Home program;
- Employee transportation coordinator;
- Increasing access to common goods and services, such as groceries and daycare;
- Incorporating affordable housing into the project;
- Secured bicycle storage facilities;
- Fix-it bicycle repair station(s);
- Bicycle route mapping resources;

- Participation in a Transportation Management Association (TMA) in partnership with other developments in the area; and
- Aggressive trip reduction targets with Lead Agency monitoring and enforcement.

TDM programs should be documented with annual monitoring reports by a TDM coordinator to demonstrate effectiveness. If the project does not achieve the VMT reduction goals, the reports should also include next steps to take in order to achieve those targets. Also, reducing parking supply can encourage active forms of transportation, reduce regional VMT, and lessen future transportation impacts on State facilities.

For additional TDM options, please refer to the Federal Highway Administration's *Integrating Demand Management into the Transportation Planning Process: A Desk Reference* (Chapter 8). The reference is available online at: http://www.ops.fhwa.dot.gov/publications/fhwahop12035/fhwahop12035.pdf.

Transportation Impact Fees

UCSF should identify project-generated travel demand and estimate the costs of transit and active transportation improvements necessitated by the proposed project; viable funding sources such as development and/or transportation impact fees should also be identified. We encourage a sufficient allocation of fair share contributions toward multimodal and regional transit improvements to fully mitigate cumulative impacts to regional transportation. We also strongly support measures to increase sustainable mode shares, thereby reducing VMT.

The UCSF should also ensure that a capital improvement plan identifying the cost of needed improvements, funding sources, and a scheduled plan for implementation is prepared. Caltrans welcomes the opportunity to work with the Lead Agency and local partners to secure the funding for needed mitigation. Traffic mitigation- or cooperative agreements are examples of such measures.

Lead Agency

As the Lead Agency, the University of California is responsible for all project mitigation, including any needed improvements to the State Transportation Network (STN). The project's fair share contribution, financing, scheduling, implementation responsibilities and lead agency monitoring should be fully discussed for all proposed mitigation measures.

Thank you again for including Caltrans in the environmental review process. Should you have any questions regarding this letter, please contact Andrew Chan at 510-622-5433 or andrew.chan@dot.ca.gov.

Sincerely,

Mark Leong
District Branch Chief
Local Development - Intergovernmental Review

c: State Clearinghouse

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

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Jack P. Broadbent
EXECUTIVE OFFICER/APCO

Connect with the
Bay Area Air District:

February 10, 2020

Dianne Wong, Environmental Coordinator
UCSF Campus Planning
654 Minnesota Street
San Francisco, CA 94143-0286

RE: UCSF Comprehensive Parnassus Heights Plan – Notice of Preparation

Dear Ms. Wong,

Bay Area Air Quality Management District (Air District) staff has reviewed the Notice of Preparation (NOP) of an Environmental Impact Report (EIR) for the Comprehensive Parnassus Heights Plan (Project). The Project establishes a long-term development framework for growth including new research, patient care, education, housing and open space land uses; demolition and major renovations; and improvements to on-campus mobility and circulation. In total, the Project provides for development of approximately 2.9 million gross square feet of new building at the campus. The Initial Phase is anticipated to be completed by 2030; the next and final Future Phase is anticipated to be completed by 2050. Because the Project proposes to modify the Parnassus Heights development plans identified in the 2014 Long Range Development Plan (LRDP), an amendment to the 2014 LRDP is proposed as part of the Project.

Air District staff recommends the EIR include the following information and analysis:

- **The GHG impact analysis should include an evaluation of the Project's consistency with the most recent draft of the AB 32 Scoping Plan by the California Air Resources Board and with the State's 2030 and 2050 climate goals.** The Air District's current recommended GHG thresholds in our CEQA Guidelines are based on the State's 2020 GHG targets, which are now superseded by the 2030 GHG targets established in SB 32. The EIR should demonstrate how the Project will be consistent with the Scoping Plan.
- **The EIR should estimate and evaluate the potential health risk to existing and future sensitive populations within and near the Project area from toxic air contaminants (TACs) and fine particulate matter ($PM_{2.5}$) as a result of the Project's construction and operation.** Air District staff recommends that the EIR evaluate potential cumulative health risk impacts of TACs and $PM_{2.5}$ emissions on sensitive receptors within and near the Project area.

- **The EIR should include design features that lessen Project air quality and GHG impacts.** Examples of potential design features that lessen air quality and GHG impacts include, but are not limited to:
  - Creating a construction phase traffic management plan that reduces diesel equipment idling.
  - Creating a Transportation Demand Management Program that includes funding for zero-emission transportation projects, including a neighborhood electric vehicle program, community shuttle/van services and car sharing, and enhancement of active transportation initiatives, among others.
  - Providing the funding and infrastructure for new, and connections to existing bicycle and pedestrian projects that improve access to transit, employment, and major activity centers.
  - Prohibiting or minimizing the use of diesel fuel, consistent with the Air District's Diesel Free By '33 initiative (http://dieselfree33.baaqmd.gov/).
  - Implementing green infrastructure and fossil fuel alternatives in the development and operation of the Project, such as solar photovoltaic (PV) panels, renewable diesel, electric heat pump water heaters, and solar PV back-up generators with battery storage capacity.
  - Requiring construction vehicles to operate with the highest tier engines commercially available.
  - Implementing a zero-waste program consistent with SB 1383 organic waste disposal reduction targets including the recovery of edible food for human consumption.

  The EIR should prioritize onsite project features to reduce air quality and GHG impacts first. Only when onsite features have been exhausted should the EIR consider offsite mitigation measures within the Project area.

- **The EIR should evaluate the Project's consistency with the Air District's 2017 Clean Air Plan (2017 CAP).** The EIR should discuss 2017 CAP measures relevant to the Project and show the Project's consistency with the measures. The 2017 CAP can be found on the Air District's website: http://www.baaqmd.gov/plans-and-climate/air-quality-plans/current-plans.

- **The EIR should analyze the Project's consistency with the *2017 Greenhouse Gas Reduction Strategy Update*, the City and County of San Francisco's most recently adopted Climate Action Plan.** The *Strategy Update* can be found at this link: https://sfmea.sfplanning.org/GHG/GHG_Strategy_October2017.pdf. The EIR should also analyze the Project's consistency with the University of California's Carbon Neutrality Initiative.

- **The Air District's CEQA website contains several tools and resources to assist lead agencies in analyzing air quality and GHG impacts.** These tools include guidance on quantifying local emissions and exposure impacts. The tools can be found on the Air District's website: http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools. If the Project requires a site-specific analysis, please contact Air District staff to obtain more recent data.

- **Certain aspects of the Project may require a permit from the Air District (for example, back-up diesel generators and hot water/space heat boilers).** Please contact Barry Young, Senior Advanced Projects Advisor, at (415) 749-4721 or byoung@baaqmd.gov to discuss permit

requirements. Any applicable permit requirements should be discussed in the EIR. All stationary sources of air pollution should be described in the EIR.

We encourage UCSF to contact Air District staff with any questions and/or to request assistance during the environmental review process. If you have any questions regarding these comments, please contact Alison Kirk, Principal Environmental Planner, at 415-749-5169 or akirk@baaqmd.gov.

Sincerely,

Greg Nudd
Deputy Air Pollution Control Officer

cc: BAAQMD Director Shamann Walton
BAAQMD Director Tyrone Jue

Organization Letters

Diane Wong
Principal Planner/Environmental Coordinator
UCSF Real Estate - Campus Planning
EIR@planning.ucsf.edu

Dear Ms. Wong,

Sutro Stewards has helped UCSF to protect and enhance the Mount Sutro Open Space Reserve since our formation in 2006. Our mission is to build community, connect people with nature, and to protect and enhance Mount Sutro, one of the City's wildest and most beautiful green spaces. We are deeply dedicated to keeping Mount Sutro healthy and accessible. Over the past 14 years, we have enhanced public access through a network of trails and worked to restore and conserve native plant habitat throughout the open space. All of our work has been supported by tens of thousands of volunteers.

Because of our commitment to this special place, we want to express our concerns about some aspects of UCSF's proposed Comprehensive Parnassus Heights Plan. In particular, we are concerned about a dramatic increase in the density of Aldea housing from 171 units to 271 units, increasing the population along with greatly increased transportation needs. Most impactful to open space users are the proposed sites where this development would occur.

Sutro Stewards relies heavily on the Aldea Center and Aldea parking to run our community volunteer events. Increasing residential density closest to the forest and our nursery will impact our ability to use these spaces and, therefore, our ability to attract volunteers who support our beneficial programs. We are also concerned that densification and increased building heights will undermine the unique aesthetics, views, wildness, and user experience that make Mount Sutro such a valuable place for connecting to nature. In addition, we believe that wildlife, including sensitive bird species, butterflies, mammals, and native plant populations could be adversely affected by the proposed building locations, increased light pollution, noise pollution, traffic, and human interaction. In addition to impacts during demolition and construction, increased building heights will potentially alter local climate, wind, and sunlight patterns. We believe all potential impacts related to aesthetics, biological resources, geology, soils, and transportation should be thoroughly evaluated including looking at the use of alternate Aldea sites at lower elevations so that no development extends higher than current existing rooftops.

Sutro Stewards wishes to support UCSF in ensuring that Mount Sutro remains a healthy ecological oasis that provides UCSF students, faculty, staff, and San Francisco residents a natural refuge for walking, running, biking, and connecting with nature. Please support our concerns by working to minimize impacts to the Mount Sutro Open Space by incorporating our suggestions into your plans.

Sincerely,



Craig Dawson
Senior Program Advisor, Sutro Stewards
craig@sutrostewards.org

Individual Letters

From:	Roger Hofmann
To:	Campus Planning - EIR
Cc:	Maria Wabl; Antenore, Dennis
Subject:	Comments to the initial study
Date:	Thursday, February 6, 2020 5:42:53 PM
Attachments:	UCSF Kirkham Project IS - UCSF Comments - 2017-04-07.pdf

Dear Ms. Wong,

The attached document is the April 7, 2017 comments letter from UCSF regarding the scoping phase of a development proposed at 1530 - 1585 5th Avenue. This property is directly adjacent to the UCSF Parnassus Heights campus. A large number of concerns were cited by the author, Lori Yamauchi.

In the spirit of fairness, it is only fitting that the concerns UCSF expressed regarding the development of an adjacent property be applied to UCSF itself. I request that these concerns be considered in the scoping of future development of the UCSF campus.

Best regards,

Roger Hofmann

University of California
San Francisco

Campus Planning

Real Estate, Planning, & Capital Programs

UCSF Box 0286
654 Minnesota Street, 2nd Floor
San Francisco, CA 94143

tel: 415.476.2911

Lori Yamauchi
Associate Vice Chancellor

lori.yamauchi@ucsf.edu
www.ucsf.edu

April 7, 2017

Lisa Gibson
Acting Environmental Review Officer
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94103

RE: Comments on 1530 5th Avenue (the Kirkham Project) Initial Study, Case No. 2014.1584ENV

Dear Ms. Gibson:

Thank you for the opportunity to review and comment on the Initial Study for the proposed project at 1530 5th Avenue (the Kirkham Project). The proposed project site directly abuts the University of California, San Francisco (UCSF) Parnasuss Heights campus, UCSF's oldest and largest campus site.

On the Parnassus Heights campus site, most of UCSF's educational, clinical, and research facilities are concentrated to the north, where Moffitt and Long Hospitals, UCSF's four schools (Medicine, Nursing, Dentistry, and Graduate Division), clinics, research, and parking are located. However, there are several important UCSF facilities in the vicinity of 5th Avenue and Kirkham Street that may be impacted by the proposed project. These facilities include the following:

- The Kirkham Child Development Center, a child care facility licensed for 93 children. Access to the facility is via Kirkham Street. Parking access to the facility is via a driveway at Kirkham Street and 4th Avenue. The facility includes an outdoor play area.

- The Proctor Foundation building is located on the southeast corner of 5th Avenue and Kirkham Street. It is a three-story structure containing patient care, research, and laboratory uses. The site includes a parking lot at the rear of the building. UCSF's 2014 Long Range Development Plan calls for the building to be demolished and replaced with housing or open space.

- The Westside Parking Lot, a 166-space surface parking lot, provides staff, patient and visitor parking adjacent to the UCSF School of Dentistry and Dentistry clinic. The lot also provides temporary parking for child drop-off at the Kirkham Child Development Center. The eastern portion of the parking lot at Kirkham Street at 4th Avenue provides access to the Dentistry building loading dock and trash/recycling pick-up area.

- 5th Avenue Housing. The residential structures on the east side of 5th Avenue between Parnassus Avenue and Kirkham Street are owned by UCSF and house UCSF faculty and their families.

- The Koret Vision Research building is located along Koret Way and occupied with ophthalmology research programs.

- UC Hall contains a mix of uses, including offices, research, and ophthalmology clinics accessed off Koret Way.

- Koret Way serves as a critical service roadway to the rear of the campus, behind buildings that front Parnassus Avenue. Koret Way terminates at the rear of the Nursing Building, providing limited access from that point to Saunders Court and the Health Sciences Institute Research towers. Parking along Koret Way is available to construction contractors, employees and patients.

- The Mount Sutro Open Space Reserve occupies the central and southern portion of the campus site and reaches 400 feet in elevation above Parnassus Avenue. The 61-acre Reserve is designated as permanent open space and is accessible to the public. A vegetation management plan for the Reserve is proposed by the University and a draft environmental impact report is being prepared. The project site abuts the Reserve on the project's east side.

Out of concern for impacts on the above UCSF facilities, we offer the following comments on the scope of the Draft EIR:

1. UCSF's Kirkham Child Development Center, the Proctor building, and 5th Avenue residential uses are located just north of the project site. During construction, maintaining emergency vehicle access and managing and mitigating construction impacts (air quality, dust, noise, and water quality) will be of the utmost concern to UCSF to maintain health and safety. We request that these topics be analyzed in the EIR.

2. Construction at the project site will involve extensive excavation and earth-moving activities that may have air quality impacts on children and residents in the area. Air quality impacts on these sensitive receptors should be studied in the EIR, and mitigation measures identified.

3. The Initial Study, Figure 8 on page 13 shows a "possible stair to forest overlook" on the northeast side of the site. It is unclear if this implies future access to UCSF's Mount Sutro Open Space Reserve. For safety and risk management reasons, UCSF has no plans to allow public access to the Reserve at this location.

4. On the UCSF campus, the Medical Research 4 (MR 4) and Laboratory of Radiobiology buildings have been demolished and the sites converted to parking areas. Please correct your maps to reflect this as an existing condition. Also, please note that the southern portion of the MR 4 parking lot may be developed with an expansion of the outdoor play yard for the nearby Kirkham Child Development Center in about year 2020 or later.

5. We would like to understand the shade/shadow impacts of the proposed project on the Kirkham Child Development Center and its current and future outdoor play yards.

6. Although CEQA Guidelines and the San Francisco Planning Department no longer require analysis of traffic impacts utilizing the level-of-service (LOS) methodology, we request that LOS analysis be prepared on a voluntary basis for this project. The 5th Avenue/Kirkham Street intersection is a critical access point to the UCSF campus, and it is important that an analysis of impacts at this intersection be evaluated in the EIR, both during construction and project operations.

7. Access to UCSF's Westside parking lot is on Kirkham Street just east of 5th Avenue. The potential for the project to impede access to this important parking and loading facility, both during construction and operation of the proposed project, should be analyzed in the EIR.

8. The proposed truck loading dock on Kirkham Street would be located directly across the street from the entrance to the Kirkham Child Development Center, where there is a frequent hub of activity with parents and children arriving and departing from the center on foot and by vehicle. This design concern was discussed in detail at a previous meeting. The ongoing activity projected to occur at the Kirkham Project truck loading entrance is of great concern – the frequency of trucks, and potential impacts related to traffic safety, pedestrian safety, noise, truck idling, and diesel fumes.

9. Although the creation of parking demand that is not met by the project would not be considered a significant impact under CEQA, we request that the project's estimated parking demand relative to the project's parking supply be evaluated in the EIR. In addition, the proposed project would involve the removal of several metered on-street parking spaces on Kirkham Street. The impacts of parking shortfalls, if any, should be discussed in the EIR.

10. We agree that the EIR should study the potential for the project to cause an increase in landslide risk. On page 100, it is stated that the project site is "not located in the immediate vicinity of any landslide prone areas." This statement is incorrect. Landslides have occurred in this area in the past, necessitating the construction of retaining walls: the large shotcrete retaining wall with tiebacks which currently exists on the project site on the south side of Kirkham Street at 4th Avenue, as well as the wood retaining wall on the UCSF campus along the east side of Koret Way.

11. Page 103. The Initial Study indicates that impacts related to hydrology will not be studied in the EIR. We believe changes to hydrological runoff may affect the potential for erosion and landslides, and therefore should be studied in the EIR.

12. The Initial Study does not mention the naturally-occuring asbestos that is likely to be encountered at the project site during excavation activities. This topic should be studied and mitigation measures should be identified in the EIR to protect nearby children, residents, employees, patients, and construction workers.

13. For public safety and aesthetic reasons, we request that the Kirkham Project developers initiate the required actions with the City and County of San Francisco for installation of new street lights and poles (consistent with the neighborhood street light standards) to replace the existing overhead power lines and poles. These new streetlights would connect to the already existing underground trenches constructed during the mid-1990s neighborhood-wide Inner Sunset Underground District.

14. UCSF's 2014 Long Range Development Plan Environmental Impact Report (LRDP EIR) included a list of potential UCSF projects to be undertaken through the LRDP horizon year of 2035, along with an estimate of when these projects might be implemented. To inform the cumulative analysis that must be undertaken in the Kirkham Project EIR, we have updated the UCSF project list (see attached).

15. In addition to the projects identified in the LRDP EIR, outside of the LRDP EIR UCSF proposes to approve and implement the Mount Sutro Vegetation Management Plan, for which an EIR is being prepared. The Initial Study is available on the UCSF Campus Planning website: https://campusplanning.ucsf.edu/. The Draft EIR will be available in summer 2017.

16. Also outside of the LRDP EIR, UCSF has initiated a complete renovation of the Clinical Sciences Building (CSB), which is currently on hold. The renovation of CSB is expected to resume in May 2017 and be completed between December 2018 and March 2019.

17. The San Francisco Municipal Transportation Agency (SFMTA) will be implementing a traffic-calming project at 5th Avenue / Kirkham Street. While the City's current schedule calls for the work to be completed before the Kirkham Project would break ground, it is possible that the traffic-calming project could be delayed and overlap with the construction of the Kirkham Project.

Should you have any questions about these comments, please contact me at (415) 476-8312, or Diane Wong of my staff at (415) 502-5952.

Sincerely,

Lori Yamauchi

Lori Yamauchi
Associate Vice Chancellor
UCSF Campus Planning

UCSF PROJECTS

Red text indicates a change from LRDP EIR Table 5-1

LRDP PROPOSAL CONSTRUCTION TIME FRAMES – PARNASSUS PROJECTS

As of April 7, 2017

Proposal Category	Proposal Title	Square Feet / Number of Dwelling Residential Units
2015 - 2019		
Demolition – completed	Medical Research 4 (PH)	12,300 gsf
Demolition – completed	Laboratory of Radiobiology (PH)	18,200 gsf
Demolition	Woods (PH)	3,900 gsf
Demolition	Surge (PH)	11,400 gsf
Other	Parnassus Avenue Streetscape Plan-Phase 1 (PH)	--
Other	Mount Sutro Open Space Reserve trails (PH)	--
Other	Medical gas storage tanks (PH)	--
2020 -2024		
Demolition	Proctor (PH)	9,900 gsf
Demolition	Langley Porter Psychiatric Institute and support structures (PH)	111,100 gsf
Renovation	UC Hall-Phase 1 (PH)	74,700 gsf/105 units
Renovation	Faculty Alumni House (PH)	7,400 gsf
Construction	Housing at Fifth and Parnassus Avenues (PH)	48,400 gsf/45 units
Construction	Proctor housing (PH)	30,400 gsf/32 units
Other	Parnassus Avenue Streetscape Plan-Phase 2 (PH)	--
Other	Saunders Court renovation (PH)	--
Other	Retaining wall (PH)	--
2025-2030		
Construction	New Hospital Addition (PH)	308,000 gsf
2031-2035		
Demolition	Koret Vision Research (PH)	43,000 gsf
Demolition	Environmental Health and Safety (PH)	6,200 gsf
Renovation	UC Hall-Phase 2 (PH)	68,300 gsf/64 units
Renovation	Millberry Union towers (PH)	46,600 gsf/83 units
Renovation	Moffitt Hospital (PH)	378,700 gsf

NON-UCSF PROJECTS

The Kirkham Project

http://sfmea.sfplanning.org/1530%205th%20Avenue%20NOP_IS_Published.pdf

http://thekirkhamproject.com/

Schedule: Construction starting summer 2018 and ending in winter 2020/2021.

The Overlook Project

http://www.sfoverlook.com/

http://sf.curbed.com/2016/11/10/13588440/overlook-crestmont-drive-sf

http://sfmea.sfplanning.org/2004.0093E_DEIR.pdf

http://sfmea.sfplanning.org/2004.0093E_RTC1.pdf

Schedule: Unknown. Approved by SF Planning Commission March 2013 and May 2015. Property recently sold?

Significant Natural Resources Areas Management Plan

http://sf-planning.org/environmental-impact-reports-negative-declarations

(numerous links on Planning Department EIR page. Click on link above and scroll down.)

Schedule: Unknown. Suggest contacting Recreation and Park Department regarding schedule for Interior Greenbelt.

From:	Roger Hofmann
To:	Campus Planning - EIR
Cc:	Maria Wabl; Antenore, Dennis
Subject:	Re: Comments to the initial study
Date:	Friday, February 7, 2020 2:20:49 PM
Attachments:	ucsf_hazard_mapping.pdf

Hi Diane,

I request that the attached document is included in your EIR analysis.

The attached document is a copy of the Haneberg, et. al., UCSF commissioned study of landslide hazard risk on the Parnassus Heights campus. The study is based on LiDAR data collected in November 2005 "*with vertical accuracy conforming to United States National Standard for Spatial Data Accuracy (NSSDA) and Federal Emergency Management Agency (FEMA) standards as shown for high resolution data*".

The subsequent computer analysis and computer generated risk maps included in the the document remain an authoritative source of information about landslide risk on the Parnassus Heights campus.

Abstract

We used airborne LiDAR (Light Detection And Ranging) to create a high-resolution digital elevation model (DEM) and produce landslide hazard maps of the University of California at San Francisco Parnassus Campus. Much of the campus consists of steep forested terrain, limiting the utility of aerial photographs and conventional topographic maps for landslide hazard mapping. The LiDAR DEM consisted of nearly 2.8 million interpolated elevation values covering approximately 100 hectares and posted on an 0.6 m horizontal grid. The primary deliverable product was a set of 16 maps. The first subset showed aspects of the topography useful for landslide mapping (e.g., shaded relief, contours, slope angle, surface roughness, and topographic contours), an engineering geologic map, and a qualitative slope hazard map. The second subset consisted of physics-based probabilistic landslide hazard maps for wet static, wet seismic, and dry seismic conditions using the computer program PISA-m. A third subset, not discussed in this paper, showed modeled runoff for a hypothetical storm and delineated watersheds on campus.

A cautionary message regarding campus development is found on page 14 of the report (emphasis mine):

The probabilistic models suggest that thin translational landsliding of the kind simulated by the infinite slope approximation should be restricted to a relatively small proportion of campus under wet static conditions. Many of these potentially unstable areas, however, are adjacent to roads, buildings, and parking lots (including off-campus property). Thus, the possibility that

landslides or rockfalls might block roads or partially cover parking lots during wet conditions should be taken into account by campus planners. The likelihood of the same general kinds of landslides increases for dry seismic conditions, although the general pattern of instability is similar. ***Under wet seismic conditions, however, wholesale translational landsliding is to be expected in all but the flattest areas on campus****. Even if the probability of a landslide occurring on flat ground is low, campus plans should take into account the possibility that landslides from adjacent steep slopes may cover flat areas such as roads and parking lots.*

In other words, if an earthquake occurs during or after a heavy rain, there is a high probability of landslides throughout the campus. This should be considered by your planning.

Best regards,

Roger

From: Wong, Diane C. <Diane.Wong@ucsf.edu> on behalf of Campus Planning - EIR <EIR@ucsf.edu>
Sent: Friday, February 7, 2020 9:51 AM
To: Roger Hofmann <bosco22@hotmail.com>; Campus Planning - EIR <EIR@ucsf.edu>
Cc: Maria Wabl <mariawabl@gmail.com>; Antenore, Dennis <antenored@earthlink.net>
Subject: RE: Comments to the initial study

Thank you Roger for your email. We will address the issues raised. Diane

---

From: Roger Hofmann <bosco22@hotmail.com>
Sent: Thursday, February 6, 2020 5:41 PM
To: Campus Planning - EIR <EIR@ucsf.edu>
Cc: Maria Wabl <mariawabl@gmail.com>; Antenore, Dennis <antenored@earthlink.net>
Subject: Comments to the initial study

Dear Ms. Wong,

The attached document is the April 7, 2017 comments letter from UCSF regarding the scoping phase of a development proposed at 1530 - 1585 5th Avenue. This property is directly adjacent to the UCSF Parnassus Heights campus. A large number of concerns were cited by the author, Lori Yamauchi.

In the spirit of fairness, it is only fitting that the concerns UCSF expressed regarding the development of an adjacent property be applied to UCSF itself. I request that these concerns be considered in the scoping of future development of the UCSF campus.

Best regards,

Roger Hofmann

High-resolution LiDAR-based landslide hazard mapping and modeling, UCSF Parnassus Campus, San Francisco, USA

William C. Haneberg

Haneberg Geoscience, 10208 39th Avenue SW, Seattle WA 98146 USA
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William F. Cole

GeoInsite, 15919 Orange Blossom Lane, Los Gatos CA 95032 USA
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Gyimah Kasali

Rutherford & Chekene, 55 Second Street, Ste. 600, San Francisco CA 94105 USA
GKasali@ruthchek.com

Abstract We used airborne LiDAR (Light Detection And Ranging) to create a high-resolution digital elevation model (DEM) and produce landslide hazard maps of the University of California at San Francisco Parnassus Campus. Much of the campus consists of steep forested terrain, limiting the utility of aerial photographs and conventional topographic maps for landslide hazard mapping. The LiDAR DEM consisted of nearly 2.8 million interpolated elevation values covering approximately100 hectares and posted on an 0.6 m horizontal grid. The primary deliverable product was a set of 16 maps. The first subset showed aspects of the topography useful for landslide mapping (e.g., shaded relief, contours, slope angle, surface roughness, and topographic contours), an engineering geologic map, and a qualitative slope hazard map. The second subset consisted of physics-based probabilistic landslide hazard maps for wet static, wet seismic, and dry seismic conditions using the computer program PISA-m. A third subset, not discussed in this paper, showed modeled runoff for a hypothetical storm and delineated watersheds on campus.

INTRODUCTION

Landslide hazard mapping in steep and heavily forested terrain is a difficult proposition for at least three reasons: First, limited visibility and difficult access reduce the area that can be directly observed during field-based mapping. Second,

aerial photograph interpretation can provide only limited information because landforms are obscured by vegetation. Third, conventional topographic maps derived from aerial photographs can be inaccurate or lack the detail necessary to identify actual or potential landslide hazards. During the past decade, airborne LiDAR (Light Detection And Ranging) — also known as airborne laser scanning (ALS), airborne laser swath mapping (ALSM), and laser altimetry— has provided practicing geologists with a new way to create high resolution digital elevation models (DEMs) and associated map products that allow accurate mapping of landforms even in areas covered by thick forest or jungle. The utility of airborne LiDAR-based maps and images for landslide hazard mapping and assessment has been shown in many parts of the United States, including the Puget Sound region of Washington (Schultz 2006, Troost et al. 2006), Oregon (Roering et al. 2005, Drazba et al. 2006), northern California (Falls et al. 2004, Stillwater Sciences 2007, Weppner et al. 2008), Idaho (Glenn et al. 2005), North Carolina (Wooten et al. 2007), and Pennsylvania (Delano and Braun 2007)), as well as other countries such as Papua New Guinea (Haneberg et al. 2005), Japan (Sato et al. 2007), Italy (Ardizzone et al. 2006), Belgium (Van Den Eeckhaut et al. 2006), and New Zealand (McKean and Roering 2004). The techniques used by those authors range from qualitative interpretation of shaded relief images to quantification of topographic roughness and implementation of physics-based mathematical models.

In this paper we describe the use of high-resolution airborne LiDAR data to support landslide hazard mapping and modeling of the steep and heavily forested Parnassus Campus of the University of California at San Francisco (Figure 1). This included collection of project-specific airborne LiDAR data, processing to create a geologically optimal DEM and related derivative maps, qualitative engineering geologic mapping, and physics-based probabilistic landslide hazard modeling of extreme conditions for which the landslide hazard could not be evaluated on the basis of mapping alone. Although virtually all LiDAR data are good enough to produce DEMs of much higher resolution than conventional photogrammetric or satellite based DEMs, we use the term "high-resolution" in a special sense to describe LiDAR data with a higher than usual ground strike density as discussed below. Our results were intended primarily for campus-wide emergency planning and to provide a geological context for more

detailed design-level geotechnical investigations undertaken for specific construction projects on campus. Although existing borehole logs were reviewed and incorporated into our interpretations, this project placed heavy emphasis on the collection, processing, and interpretation of airborne LiDAR topographic data to aid in the identification of geomorphic features and conditions conducive to landsliding.

GEOLOGIC SETTING

The general geology of San Francisco is described in many maps and reports, both published and unpublished. The Parnassus campus lies in the San Francisco North 7.5' quadrangle, which was mapped by Schlocker (1974) and is included in the more recent regional map compiled by Blake et al. (2000).

The geology of San Francisco is characterized by bedrock knobs and hills of Jurassic Francisan Complex bedrock (highly deformed chert, greenstone, meta-sandstone, and shale) that protrude through such younger deposits as Quaternary alluvium, dune sand, and shallow marine sediments. The Parnassus campus is located on a prominent Franciscan bedrock knob known as Mt. Sutro. As shown in Figure 2, the steep slopes of Mt. Sutro are covered with a dense eucalyptus forest and, with the notable exception of a winding two-lane road, most of the campus infrastructure lies around its edges. Bedrock occurs at or very near the ground surface throughout much of the project area, but locally is overlain by surficial materials (colluvium and shallow landslides) within drainages that have developed on the steep hillsides of Mt. Sutro.

Wilson et al. (2000) conducted a seismic slope stability hazard analysis of San Francisco and noted several landslides on Mt. Sutro, but do not appear to have collected detailed information on the campus per se, and produced a table of susceptible geologic units rather than a hazard map. Other sources of information used in this project include historical and recent borehole logs and unpublished consulting reports on file at Rutherford & Chekene.

LiDAR DATA COLLECTION AND PROCESSING

LiDAR data for this project were collected in November 2005 by a commercial vendor as part of a project to obtain standard resolution LiDAR coverage of San Francisco. The vendor reduced the typical flying height from

1400 m to 900 m and collected approximately 400 hectares of high-resolution LiDAR data covering the UCSF campus and adjacent areas with vertical accuracy conforming to United States National Standard for Spatial Data Accuracy (NSSDA) and Federal Emergency Management Agency (FEMA) standards as shown for high resolution data in Table 1. The FEMA contour interval is that which can typically be supported using the listed quality of LiDAR data. For normally distributed errors, approximately 68% of the measured errors should fall within the tabulated root mean square error (RMSE) and 95% should fall within twice the tabulated RMSE. Vegetation and cultural features were removed by the vendor prior to data delivery in order to produce a so-called bald earth or bare earth data set.

Compliance with the contract accuracy specifications was documented by a licensed surveyor under contract to the vendor, who collected GPS elevations at 145 points within the vendor's overall LiDAR project area (but outside of the more limited UCSF project area described in this paper). Measured vertical errors followed a distribution that, while not strictly normal, displayed a strong central tendency with minimal bias (Figure 3). The RMSE of ±0.06 m was less than the maximum acceptable value of ±0.09 m. Horizontal errors were estimated by the vendor to be on the order of 1/3000 of the flying altitude.

Quality assurance GPS measurements for contract compliance are generally collected in flat and open areas to reduce data analysis complications, including the contribution of horizontal errors, and the practical or operational accuracy of LiDAR-based DEMs can be nearly an order of magnitude worse than that suggested by quality assurance measurements. In a comparison of a LiDAR DEM covering a portion of Seattle, Washington, with GPS measurements, Haneberg (2008) found that LiDAR elevation errors had a standard deviation of ±0.75 m and statistically significant correlations slope angle, topographic roughness, and to some extent elevation (but not slope aspect). He did not separately evaluate the effects of interpolation errors arising from different DEM gridding algorithms, which may also be important. The accuracy of the LiDAR data DEM was, however, substantially better than a conventional 10 m DEM covering the same area, which had a standard deviation of ±2.36 m (Haneberg 2006a).

The LiDAR data were supplied to us as ASCII text files containing the xyz coordinates and uncalibrated laser return intensity values separated into files identified as ground strikes and extracted features such as trees and buildings. Coordinates were converted by the vendor from the original WGS84 coordinates to the California State Plane Coordinate System (U.S. survey feet, NAD83 HARN horizontal datum, NAVD88 vertical datum) as preferred by both the client and principal engineering contractor.

Optimally Interpolated Digital Elevation Model

We produced an optimally interpolated DEM from the xyz bare earth point cloud supplied by the LiDAR vendor using a trial-and-error process in which two different interpolation algorithms (inverse distance squared and regularized splines with tension) and different interpolation parameters were evaluated in order to produce a DEM suitable for geologic interpretation and slope hazard mapping at the UCSF site. Selection of an appropriate DEM grid spacing begins with review of the LiDAR ground strike data, particularly with regard to ground strike spacing and density in geologically critical areas such as steep slopes. Care was taken to minimize obvious interpolation artifacts such as dimples or rectilinear patterns that can arise if the chosen grid is too fine, while at the same time maximizing the geologic utility of the DEM. Experience has shown that DEMs useful for landform mapping are best when the grid spacing is no less than ¼ to 1/5 the typical ground strike spacing in geologically critical areas. The DEM for this project was interpolated onto a 0.6 m (2 feet) horizontal grid using completely regularized splines with tension as implemented in the commercial raster GIS software MFWorks, with a precision of 0.01 foot (0.03 m), tension of 1.0, a block size of 1, an overlap area of 200 cells, and a sufficient sample number of 5. The advantages of creating a geologically optimal DEM rather than obtaining a DEM from the LiDAR vendor are addressed in the DISCUSSION section at the end of this paper.

Geomorphic Derivative Maps

The optimally interpolated DEM was used to create a series of geomorphic derivative maps similar to those described by Haneberg et al. (2005), Haneberg (2007), and Troost et al. (2006). These included topographic contour maps (Figure

4), a suite of shaded relief images with different simulated illumination directions (Figure 5), and maps depicting quantitative measures such as slope angle and topographic roughness. Although topographic roughness maps have been proven useful in other landslide studies, we found roughness maps showing eigenvalue ratios (McKean and Roering 2004) and residual deviations (Haneberg et al. 2005, Haneberg 2007) to be of limited utility in this study.

INTERPRETIVE MAPS

We created a series of three engineering geologic maps: 1) A standard engineering geologic map using the Unified Engineering Geologic Mapping System (Keaton and DeGraff 2004) to show the genesis and lithology of mapped features, 2) a cut and fill slope map showing areas in which natural slopes had been modified by human activity, and 3) a slope hazard map based upon qualitative interpretations by the project team. These are shown draped over a shaded relief image in Figures 5 through 7.

Engineering Geologic Map

The engineering geologic map (Figure 5) was created by integrating the DEM and its derivatives with field-based observations of geologic conditions. Following preliminary processing of the LiDAR data, fieldwork took place over two days in May 2006 and the map was finalized in the office to allow the use of digital mapping techniques such as the superposition of engineering geologic information with the shaded relief, slope angle, roughness, and contour maps.

Soil and rock types are shown on the engineering geologic map using the Unified Engineering Geologic Mapping System (Keaton and DeGraff 1996), with vertical series of soil or rock types used to indicate the stratigraphic sequence of map units. Other features relevant to the project— for example, areas of slow soil creep, landslides, and rock outcrops— are also shown on the map. Much of the area shown as chert (CH) on the engineering geologic map is overlain by thin soil, but outcrops are common and the soil thickness is not likely to exceed a meter or so. Thus, the thin soil over chert was not shown on the map. Although features that may be indicative of potential future instability (for example old landslides or areas undergoing soil creep) are shown, the engineering geologic map does not evaluate the likelihood of future occurrence or severity of slope hazards.

Most of the bedrock exposed on campus is folded and thinly bedded red and green chert of the Franciscan Complex. A small area of sandstone occurs in the northwestern portion of the campus. In the few locations where strike and dip directions could be measured in the tightly folded to wavy chert beds, the orientations represent average conditions. Relatively young shallow marine sediments of the Colma Formation were encountered at depth in previous geotechnical borings but the formation is not exposed at the surface in the project area.

The engineering geologic map (Figure 5) shows a possible ancient landslide occupying much of the area beneath the most highly developed north-central portion of the campus. Identification of this feature is tentative because naturally occurring landforms indicative of landsliding have been largely destroyed by development. The large bowl-shaped feature, information from borehole logs on file at Rutherford & Chekene, and an unpublished bedrock structure contour map completed after this project suggest that the area may be underlain by a large landslide, perhaps involving Franciscan bedrock, of old but uncertain age.

The possibility of a large ancient landslide in this highly developed area was raised as long ago as 1948 by in a letter to UCSF from engineering geologist Chester Marliave but was discounted in later investigations by local consultants based primarily on the contention that the northward sloping sedimentary strata encountered in a campus construction project were 1) continuous and 2) bore no resemblance to chaotic strata that had been identified by others to be associated with large ancient landslides in the region. A thorough evaluation of the potential ancient landslide, which would include a detailed subsurface synthesis supported by additional drilling and testing, was beyond the scope of this project. Therefore, a possible landslide is shown on the engineering geologic map.

Cut and Fill Slope Map

Cut and fill slopes, which are often shown on engineering geologic maps such as that in Figure 5, were shown on a separate map for clarity (Figure 6). Both types of slopes were identified on the basis of preliminary field observations and refined using digital terrain analysis to identify the extent of over-steepened slopes inferred to have been produced by human activity. Detailed as-built construction

documents were not available, so the cut and fill slope map represents a geologic interpretation based on slope form and a general knowledge of construction techniques. Some cut or fill slopes may not be shown.

Qualitative Slope Hazard Map

The qualitative slope hazard map (Figure 7) is an interpretive map that combines the information shown on the engineering geologic map (Figure 5), the cut and fill slope map (Figure 6), and our field observations with professional experience to depict areas in which we infer slope instability is most likely to occur. Areas with signs of very recent or imminent movement are shown in red, whereas areas with the potential for future movement as a consequence of heavy rain or seismic shaking, or some combination of the two, are shown in yellow and orange. Although there is a potential for shallow landslides and debris flows in the areas shown as chert overlain by thin soil on the engineering geologic map (Figure 5), we did not include this as potential slope hazard on Figure 7 because any such slides are likely to be small and, because of their remote locations, without much effect on campus safety or access. Areas underlain by chert adjacent to roads, from which shallow slope failures have the potential to limit campus access, are shown as cut or fill slope hazards as appropriate.

The possible landslide shown on the engineering map is categorized as stable on the qualitative slope hazard map because 1) it lies low on the slope and therefore possesses little potential energy relative to the areas it might affect, 2) it appears to be buried and buttressed by younger sediments, and 3) this investigation yielded no signs of recent movement, for example open cracks or deformed cultural features, in the area. This project did not, however, include a quantitative stability evaluation of the possible landslide and the potential for future movement is unknown.

PROBABILISTIC SLOPE STABILITY MODELING

The high-resolution LiDAR DEM was used to produce physics-based probabilistic landslide hazard maps using the first-order, second-moment (FOSM) approach described by such authors as Haneberg (2000, 2004), van Westen and Terlien (1996), Wu et al. (1996), Wolff (1996), and Mankelow and Murphy (1998). We used the computer program PISA-m (the acronym stands for map-

based Probabilistic Infinite Slope Analysis) written by Haneberg (2006b) to perform the calculations for this project. PISA-m takes as input a digital elevation model, maps showing geotechnical soil units and forest cover units, and information about geotechnical parameters and their probability distributions for each map unit. Unlike previous approaches in which all of the input variables were restricted to normal distributions (van Westen and Terlien 1996, Mankelow and Murphy 1998), PISA-m accepts normal, uniform, triangular, and β-PERT distributions as well as constant values as input, calculating equivalent means and variances for non-normal distributions (Haneberg 2006b). PISA-m output options include maps showing the probability that the calculated factor of static safety against landsliding is less than the critical value (Prob [$FS \leq 1$]), the mean factor of safety, the standard deviation of the factor of safety, or a non-parametric slope reliability index for each raster within the DEM.

PISA-m is based on the infinite slope approximation, and is therefore most useful for simulating the occurrence of landslides that are thin relative to their lengths and widths. As used in this project, the calculated probability does not explicitly include any reference to time or recurrence intervals, for example as an annual probability of landsliding. Instead, it should be interpreted as a conditional probability given the pore water pressure distributions used as input for the model. Stillwater Sciences (2007) and Weppner et al. (2008) describe watershed-scale applications of PISA-m in which the pore water pressure variable was assigned temporal significance by using an extreme value distribution to model peak annual pore pressure and the model results compared to landslide inventory maps.

PISA-m Theoretical Background

Details of the first-order, second-moment approximation used in PISA-m are given in Haneberg (2000, 2004, 2006b) and briefly summarized without further reference below. The static component of the probabilistic model is based on the factor of safety against sliding for a forested infinite slope (Hammond et al. 1992):

$$FS = \frac{c_r + c_s + \left[q_t + \gamma_m D + \left(\gamma_{sat} - \gamma_w - \gamma_m\right) H_w D\right] \cos^2 \beta \tan \phi}{\left[q_t + \gamma_m D + \left(\gamma_{sat} - \gamma_m\right) H_w D\right] \sin \beta \cos \beta} \qquad (1)$$

in which

c_r = cohesive strength contributed by tree roots (kPa)

c_s = cohesive strength of soil (kPa)

q_t = uniform surcharge due to weight of vegetation (kPa)

γ_m = unit weight of moist soil above phreatic surface (N/m^3)

γ_{sat} = unit weight of saturated soil below phreatic surface (N/m^3)

γ_w = unit weight of water (9810 N/m^3)

D = thickness of soil above slip surface (m)

H_w = relative height of phreatic surface (dimensionless)

β = slope angle (degrees)

ϕ = angle of internal friction (degrees)

The influence of groundwater is incorporated using a slope-parallel phreatic surface, so that the pore water pressure is the pressure exerted by a column of water equal in height to that of the phreatic surface above a potential slip surface. This is a common but not necessary assumption for infinite slope analyses. It is, however, reasonable in cases where a relatively permeable surficial deposit is underlain by less permeable bedrock. The variable H_w represents a normalized phreatic surface height that has a range of 0 to 1 for non-artesian conditions.

The effects of parameter uncertainty and variability are incorporated using first-order, second-moment (FOSM) approximations. A mean value of *FS* is first calculated using the mean values of each of the independent variables, or

$$\overline{FS} = FS(\bar{x}) \tag{2}$$

For uncorrelated independent variables, the variance (or second moment about the mean) of *FS* can then be estimated by the first-order truncated Taylor series

$$s_F^2 = \sum_i \left(\frac{\partial FS}{\partial x_i} \right)_{\bar{x}}^2 s_{x_i}^2 \tag{3}$$

in which $s_{x_i}^2$ is the variance of the ith independent variable. The terms in parentheses are evaluated using mean values for each of the independent variables (implying that each of the derivatives is a constant), and their squares are lengthy equations when all of the variables in equation (1) are included.

Means and variances for the soil properties and pore pressures were estimated on the basis of tabulated data and professional experience. The mean and variance for the slope angle at each point (*r,c*) within the DEM was calculated using the approximations

$$\beta_{r,c} = \arctan\left[\frac{\sqrt{(z_{r,c+1} - z_{r,c-1})^2 + (z_{r+1,c} - z_{r-1,c})^2}}{2\Delta s}\right] \tag{4}$$

and

$$s_\beta^2 = \frac{8(\Delta s)^2 s_z^2}{\left[4(\Delta s)^2 + (z_{r+1,c} - z_{r-1,c})^2 + (z_{r,c+1} - z_{r,c-1})^2\right]^2} \tag{5}$$

The static method of Haneberg (2004) can be extended to include seismic slope stability by using the calculated mean factor of safety to calculate the mean Newmark (1965) yield acceleration:

$$\overline{a_N} = g\left(\overline{FS} - 1\right)\sin\overline{\beta} \tag{6}$$

in which a_N is the yield acceleration beyond which seismically-induced movement can occur, FS is the static factor of safety for a slope, g is gravitational acceleration, and (for infinite slopes) β is the slope angle. The overbars indicate that in each case the mean value for each point within the DEM is used for the calculation. The calculated $\overline{a_N}$ value at each point within the DEM was then combined with the Arias intensity for a postulated earthquake to calculate the expected mean downslope movement using the regression equation developed by Jibson et al. (2000):

$$\overline{\log D_N} = 1.521 \log I_A - 1.993 \log \overline{a_N} - 1.546 \tag{7}$$

in which D_N is the displacement (in centimeters) of an unstable slope as the result of seismic shaking, I_A is the observed or predicted Arias intensity (m/s), and a_N is the Newmark critical acceleration with units of g. The Jibson et al. (2000) regression model has a published standard deviation of ±0.375, which is used along with the calculated mean displacement to calculate the probability that the displacement for the modeled earthquake is greater than a user specified threshold, or Prob[$D_N > D_{thresh}$]. Based on the results of numerical Monte Carlo

simulations of seismic slope instability, this probability was calculated using the assumption that D_N is log-normally distributed (Haneberg 2006, 2008).

PISA-m Model Input

Slope angles for the probabilistic model were calculated from the DEM using a standard second-order accurate finite difference approximation as described in equations (4) and (5). Soil properties were estimated using representative values for San Francisco tabulated in Wilson et al. (2000), literature compilations such as Hammond et al. (1992), and our local experience. In particular, the scarcity of outcrops on the UCSF campus and small-scale structural complexity of the thinly bedded and highly deformed Franciscan chert bedrock made it impossible to make useful model-scale distinctions between favorable and adverse bedding conditions throughout the campus. Moreover, the shear strength of deformed rocks at or near the surface is controlled by discontinuities such as pervasive joints or faults. Therefore, the probabilistic model uses average values with uncertainties to reflect the structural complexity, which allows for the possibility of adverse, average, or favorable discontinuity orientations of both bedding and fractures at any given location. As discussed by Haneberg (2006, 2008) DEM elevation errors are spatially correlated and can create slope angle errors that propagate into slope stability calculations. PISA-m takes elevation errors into account using equation (5). Based upon previous experience with LiDAR and conventional DEM elevation errors, we specified an elevation error standard deviation of ±3 mm (±0.01 feet) for points separated by 1.2 m (4 feet), the distance over which the slope angles are calculated by PISA-m.

Based upon site-specific engineering geologic mapping, the probabilistic analyses were conducted using two soil types (geotechnical map units): thin soil over chert and thick colluvium in valleys. As shown in Tables 2 and 3, the geotechnical variables were specified as either being random variables (in this case following either normal or uniform distributions) or single-valued constants. Normally distributed variables are shown in Tables 2 and 4 using their means and standard deviations whereas uniformly distributed variables are shown in terms of their minimum and maximum values, although PISA-m calculates equivalent means and variances for the latter.

Both soil types were assigned similar shear strength parameters and unit weights, but differed in thickness and degree of saturation as shown in Tables 2 and 3. The assumed increased wetness of thick colluvium-filled valleys was incorporated using a dimensionless degree of saturation of $H_w = 0.75 \pm 0.084$ (mean ± standard deviation) versus a value of $H_w = 0.50 \pm 0.084$ for the soil over chert for the static calculations to represent a range of realistically possible wet season values (no piezometric field data were available to constrain extreme pore pressure values). The seismic calculations were performed first using the same wet season values and then again with zero pore pressure to represent a dry season earthquake. Wet season pore pressure values are likely to occur during the rainy season that generally occurs between October 15 and April 15. High pore water pressure values can occur locally outside of the rainy season as the result of such artificial causes as leaking or broken water lines, storm drains, or water tanks.

The Arias intensity of the modeled earthquake was calculated from the same strong motion record used by Wilson et al. (2000) for their citywide analysis, from the Southern California Edison Lucerne station during the 1992 M7.3 Landers earthquake. Digital versions of all three components were downloaded from the Pacific Earthquake Engineering Research Center (PEER) web site and integrated to calculate Arias intensities of $I_A = 7.0$ m/s (azimuth 260°), $I_A = 6.6$ m/s (azimuth 345°), and $I_A = 8.2$ m/s (vertical). The two horizontal intensities are indistinguishable from those calculated by Jibson and Jibson (2003) from the same records, and the stronger of the two horizontal intensities ($I_A = 7.0$ m/s) was chosen for the modeled earthquake. Figure 9 shows the 260° horizontal strong motion record used to calculate the $I_A = 7.0$ m/s value. A displacement threshold of 30 cm was selected for the seismic probabilistic slope stability maps, corresponding to the 30 cm threshold used to delineate high hazard areas by Wilson et al. (2000).

PISA-m Model Results

Results for the three probabilistic models (static wet, seismic wet, and seismic dry conditions) are shown on separate maps (Figures 10, 11, and 12). The probabilistic results share both similarities and differences with the qualitative slope hazard map (Figure 8). Some areas shown as potentially unstable colluvium on the qualitative slope hazard map are shown to have a low probability of

landsliding on the static and dry seismic probabilistic maps. Conversely, many steep areas shown as chert covered by ostensibly stable thin soil on the qualitative slope hazard map are shown to have a high probability of landsliding on the static and dry seismic probabilistic maps. This is because the qualitative slope hazard map is based on criteria that emphasize the inferred importance of thick cohesive soil accumulations in topographic depressions such as hollows, swales, and valleys. The qualitative map does not incorporate any information about steepness; thus, a relatively flat colluvium filled valley bottom would receive the same designation as a steeper colluvium mantled slope. The qualitative model also assumes that landslides in thin soils are insignificant compared to landslides in thick wet colluvium in depressions, whereas the probabilistic models allow for landslides in thin soils overlying chert and explicitly take into account the fact that the thickness of cohesive soils has an effect on their stability.

Both the qualitative slope hazard map (Figure 9) and the probabilistic maps (Figures 10, 11, and 12) show over-steepened cut and fill slopes to be potentially unstable even though the actual modes of failure are likely to depart from translational sliding of thin soil layers or rock slabs. Cut slope failures observed in chert and sandstone are mostly topples and wedge failures controlled by rock discontinuities. Fill slope failures are likely to be rotational.

The probabilistic models suggest that thin translational landsliding of the kind simulated by the infinite slope approximation should be restricted to a relatively small proportion of campus under wet static conditions. Many of these potentially unstable areas, however, are adjacent to roads, buildings, and parking lots (including off-campus property). Thus, the possibility that landslides or rockfalls might block roads or partially cover parking lots during wet conditions should be taken into account by campus planners. The likelihood of the same general kinds of landslides increases for dry seismic conditions, although the general pattern of instability is similar. Under wet seismic conditions, however, wholesale translational landsliding is to be expected in all but the flattest areas on campus. Even if the probability of a landslide occurring on flat ground is low, campus plans should take into account the possibility that landslides from adjacent steep slopes may cover flat areas such as roads and parking lots.

DISCUSSION

The combination of high-resolution LiDAR-based digital terrain modeling, field-based engineering geologic mapping supplemented by office-based virtual mapping, and physics-based probabilistic slope stability modeling allowed us to evaluate existing and potential slope stability hazards on the steep and densely forested UCSF Parnassus Campus. Neither the mapping nor modeling could have been accomplished at the same level of detail without the LiDAR coverage. Traditional engineering geologic mapping on aerial photographs or a photogrammetrically derived topographic base would have been too generalized for precise modeling or interpretation of slope behavior. Conversely, the combination of field-based mapping, office-based virtual mapping, and physics-based probabilistic modeling allowed us to augment and maximize the value of the LiDAR data by going beyond simple qualitative interpretation of shaded relief images or contour maps.

Processing of the scattered point cloud as one of the geologic parts of a project data has distinct advantages over the use DEMs created by a LiDAR vendor without geologic considerations. Using point cloud data allows the LiDAR ground strike density patterns in geologically critical areas— for example, steep vegetated slopes— to be critically examined by experienced geologists, geomorphologists, or geotechnical engineers. Ground strike spacing can influence the detail shown on a gridded DEM and control the scales of features that can be identified in different parts of a project area. Regardless of the supposed resolution of a DEM, geomorphic features smaller than the actual ground strike spacing in different parts of a project area will not be depicted. Our experience has been that landforms with characteristic dimensions less than an order of magnitude greater than the typical ground strike spacing cannot be reliably recognized as such. Thus, the ability superimpose a LiDAR ground strike map during virtual mapping sessions in the office can help to show the minimum size of features that one might hope to map in different parts of the project area. Working with the point cloud data also allows experienced geo-professionals to experiment with different gridding algorithms and parameters with the objective of producing a DEM that is optimized for landform mapping in a particular project area.

The benefit of creating a set of derivative maps is that, whereas only a finite number of paper maps can be carried in the field, an almost infinite number of map combinations can be created electronically for preliminary office interpretation before fieldwork and virtual map refinement after fieldwork. For example, the geologist can create combinations such as a shaded relief image with illumination from the east draped with a color map of slope angles and 1.5 m contour lines and then alternate shaded relief maps to see if his or her interpretations change. Supporting imagery such as aerial orthophotos, multispectral images, or historical geologic maps can also be included if available, particularly if the work is done within a GIS framework that supports the use of files with different projections, coordinate systems, and geodetic datums. For this project, contour maps with a 1.5 m contour interval proved to be the most useful base for engineering geologic mapping in the field.

Finally, we found physics-based probabilistic modeling using PISA-m to be a useful tool for evaluating extreme or rare conditions such as very wet slopes or large earthquakes. Field-based engineering geologic mapping can provide critical information about recent or current slope instability. Precise forecasting of the areal consequences of rare, extreme, or unprecedented events based on field observations, however, is difficult to impossible. Thus, observation and modeling are best used as complementary— rather than mutually exclusive— approaches to leverage the value of LiDAR digital elevation data.

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Table 1. LiDAR vendor resolution specifications (measurements in meters)

LiDAR Resolution	Typical Flying Altitude	FEMA Contour Interval	Typical LiDAR Spot Spacing	Allowable NSSDA RMSE[1]
High	900	0.3	1.0	±0.09
Standard	1400	0.6	1.4	±0.18
Low	2000	1.0	1.8	±0.30

[1] RMSE = root mean squared error

Table 2. PISA-m geotechnical parameters for Soil Type 1: Thin soil over chert.

Variable	Distribution	Mean	Std. Dev.	Minimum	Maximum
ϕ (degrees)	Normal	30	±1.67		
c_{soil} (kPa)	Normal	19.2	±6.2		
d (m)	Normal	0.76	±0.26		
h_{wet}	Normal	0.50	±0.084		
h_{dry}	Constant	0			
γ_{moist} (N/m^3)	Uniform			15,700	18,900
$\gamma_{saturated}$ (N/m^3)	Uniform			18,900	20,400
c_{roots} (kPa)	Normal	6.2	±1.5		
q (kPa)	Constant	0			

Table 3. PISA-m geotechnical parameters for Soil Type 2: Thick soil in valleys.

Variable	Distribution	Mean	Std. Dev.	Minimum	Maximum
ϕ (degrees)	Normal	30	±1.67		
c_{soil} (kPa)	Normal	19.2	±6.2		
d (m)	Normal	3.05	±0.91		
h_{wet}	Normal	0.75	±0.084		
h_{dry}	Constant	0			
γ_{moist} (N/m^3)	Uniform			15,700	18,900
$\gamma_{saturated}$ (N/m^3)	Uniform			18,900	20,400
c_{roots} (kPa)	Constant	0			
q (kPa)	Constant	0			

FIGURE CAPTIONS

Figure 1. Landsat false color image of the San Francisco peninsula and adjacent areas. Red colors denote green vegetation and light blue colors denote urbanized areas. The UCSF project area is marked by the yellow circle.

Figure 2. Color 30 cm (1 foot) raster orthophoto showing approximate extent the UCSF Parnassus Campus (pink dashed line) and dense forest cover on Mt. Sutro. Photo source: US Geological Survey, photo date 27 February 2004.

Figure 3. Histogram of measured vertical LiDAR errors for 145 quality assurance points collected near, but not in, the UCSF project area by the LiDAR vendor. The project contract specifications called for a maximum permissible RMSE of ±0.09 m compared to the measured value of ±0.06 m. A scaled normal distribution with the measured mean and standard deviation is superimposed for comparison.

Figure 4. Contour map of the project area based on the 0.6 m (2 foot) LiDAR DEM with no smoothing applied. Contour interval: 1.5 m (5 feet).

Figure 5. Shaded relief images illustrating the effects of changing simulated illumination azimuth with a constant inclination of 30°. A) Illumination from 270°. B) Illumination from 000°. C) Illumination from 090°. D) Ommidirectional illumination created by adding together the maps shown in parts A, B, and C of this figure.

Figure 6. Engineering geologic map draped over the omnidirectional shaded relief image from Figure 5D. Lithologic units are shown using the Unified Engineering Geologic Mapping System with stacked lithologic symbols indicating the local stratigraphy (Keaton and DeGraff, 1994).

Figure 6. Engineering geologic map draped over the omnidirectional shaded relief image from Figure 5D. Lithologic units are shown using the Unified Engineering Geologic Mapping System with stacked lithologic symbols indicating the local stratigraphy (Keaton and DeGraff, 1994).

Figure 7. Cut and fill slope map draped over the omnidirectional shaded relief image from Figure 5D. Areas of cut and fill were inferred from a combination of field observations and office based digital terrain modeling using the high-resolution LiDAR DEM.

Figure 8. Qualitative landslide hazard map draped over the omnidirectional shaded relief image from Figure 5D.

Figure 9. PISA-m probabilistic landslide hazard map for wet static conditions, draped over the omnidirectional shaded relief image from Figure 5D. See Tables 2 and 3 for geotechnical parameters.

Figure 10. Strong motion record used to calculate the Arias intensity of I_A = 7.0 m/s used as input for the seismic component of the rational probabilistic slope stability model. The record was obtained from the Pacific Earthquake Engineering Research Center (PEER) strong motion database. Record is for the Southern California Edison Lucerne station during the 1992 Landers M = 7.3 earthquake (direction: 260°).

Figure 11. PISA-m probabilistic landslide hazard map for dry seismic conditions, draped over the omnidirectional shaded relief image from Figure 5D. See Tables 2 and 3 for geotechnical parameters.

Figure 12. PISA-m probabilistic landslide hazard map for wet seismic conditions, draped over the omnidirectional shaded relief image from Figure 5D. See Tables 2 and 3 for geotechnical parameters.

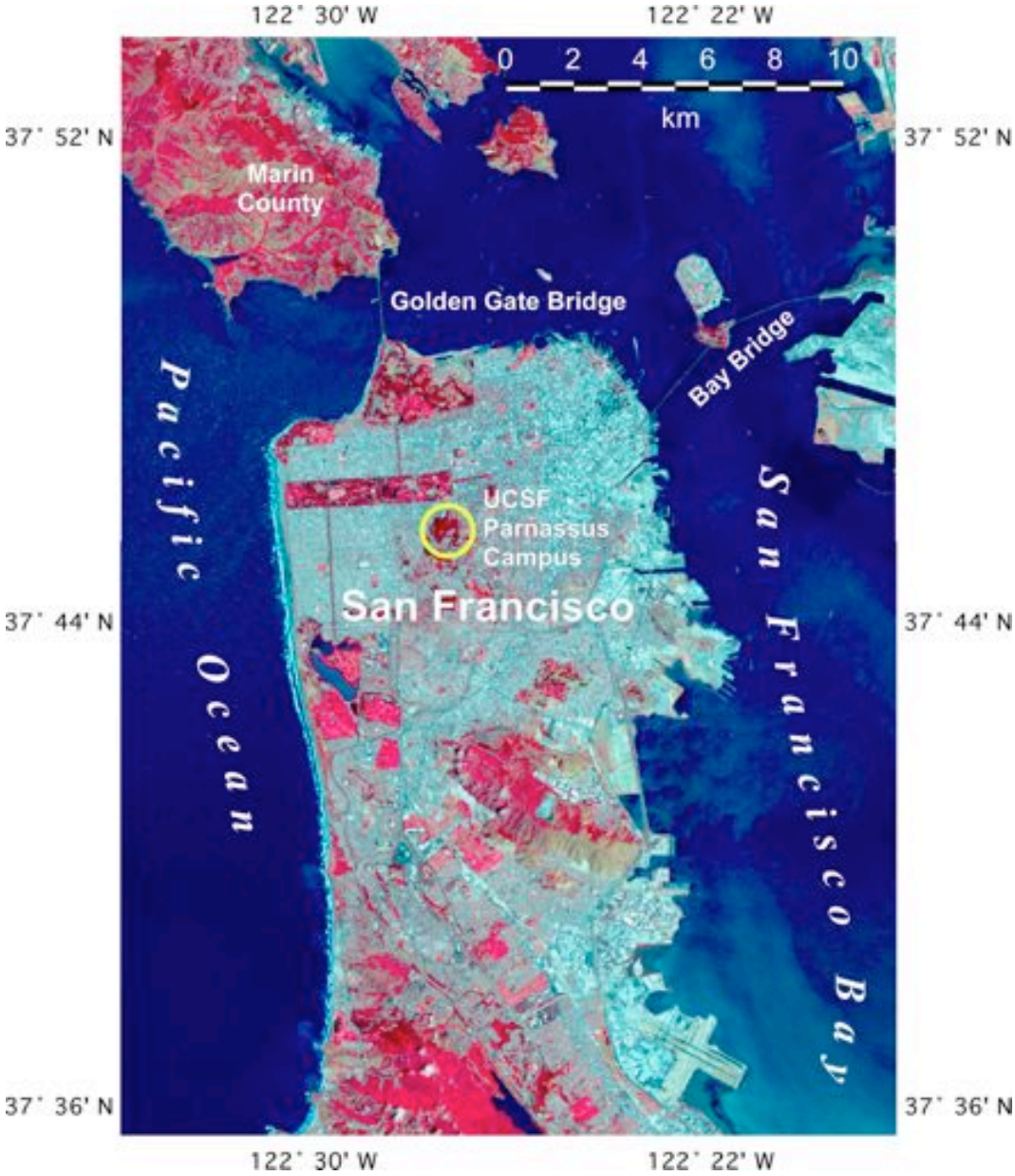
122° 30' W
122° 22' W
0 2 4 6 8 10
km
37° 52' N
37° 44' N
37° 36' N
Marin County
Golden Gate Bridge
Bay Bridge
UCSF Parnassus Campus
San Francisco
Pacific Ocean
San Francisco Bay

Figure 1



Figure 2

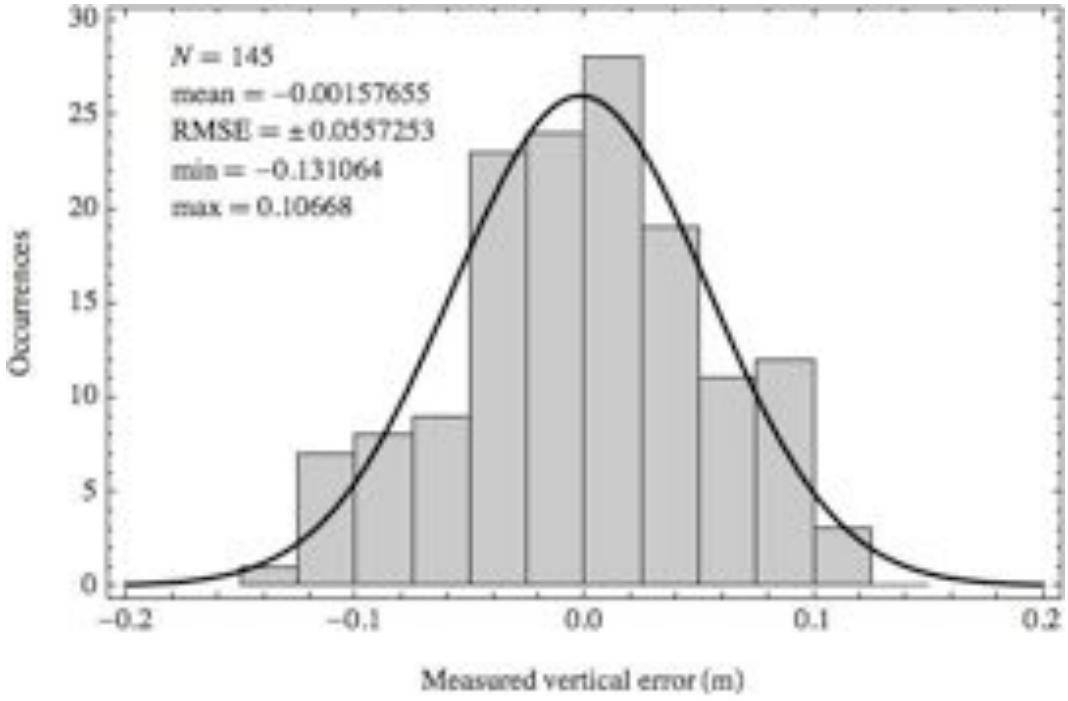
N = 145
mean = −0.00157655
RMSE = ±0.0557253
min = −0.131064
max = 0.10668
Occurrences
Measured vertical error (m)
30
25
20
15
10
5
0
−0.2
−0.1
0.0
0.1
0.2

Figure 3

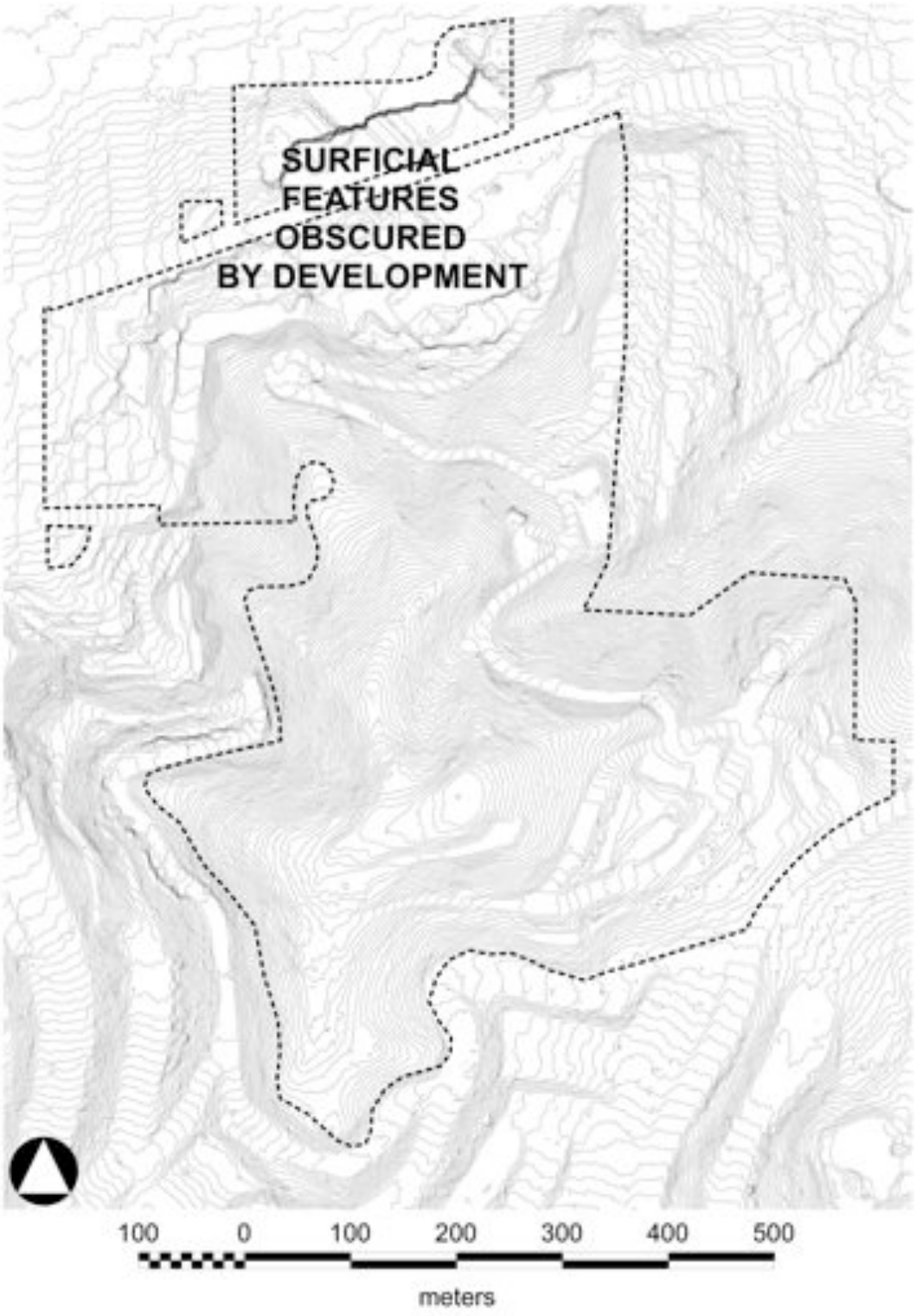
SURFICIAL
FEATURES
OBSCURED
BY DEVELOPMENT
100 0 100 200 300 400 500
meters

Figure 4

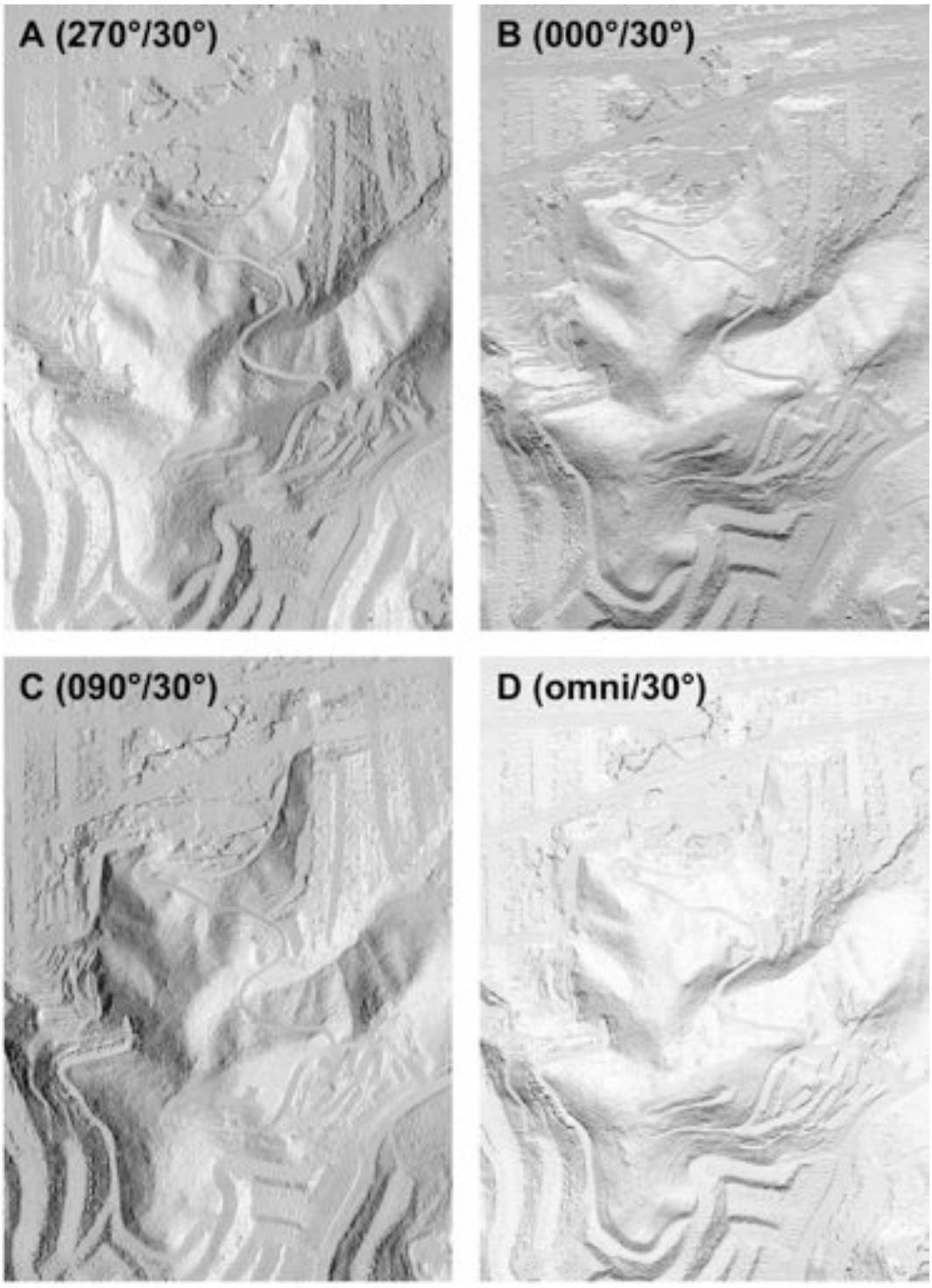

Figure 5

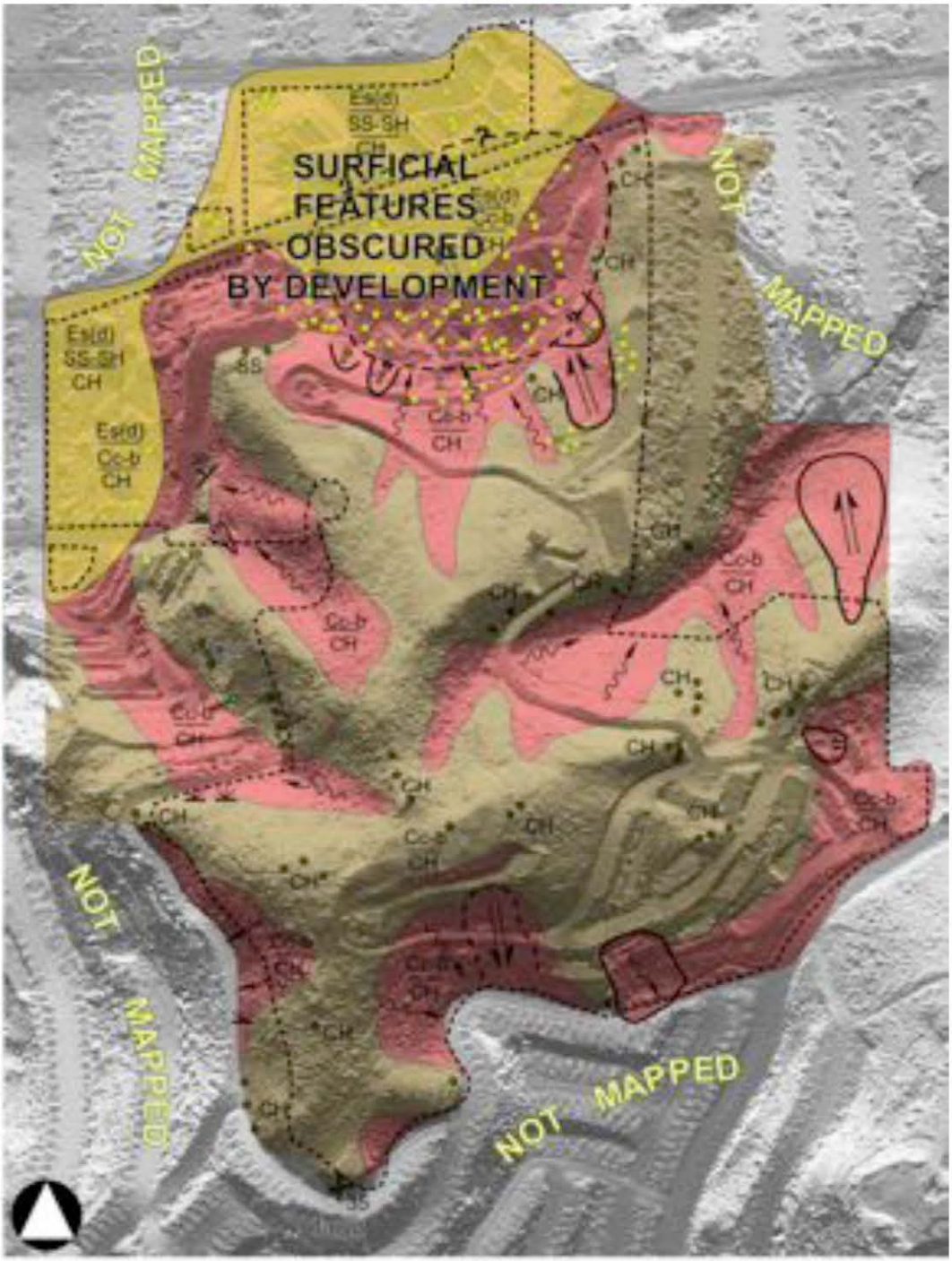
NOT MAPPED
SURFICIAL FEATURES OBSCURED BY DEVELOPMENT
NOT MAPPED
NOT MAPPED
NOT MAPPED
Es(d) SS-SH CH
Es(d) Cc-b CH
Cc-b CH
CH
SS
100 0 100 200 300 400 500
meters
Es(d) Eolian sand (dune)
Cc-b Colluvium, clayey-bouldery
CH Chert
SS Sandstone
SH Shale
not exposed
soil creep
landslide
seep or spring
strike and dip
bedrock outcrop
borehole

Figure 6

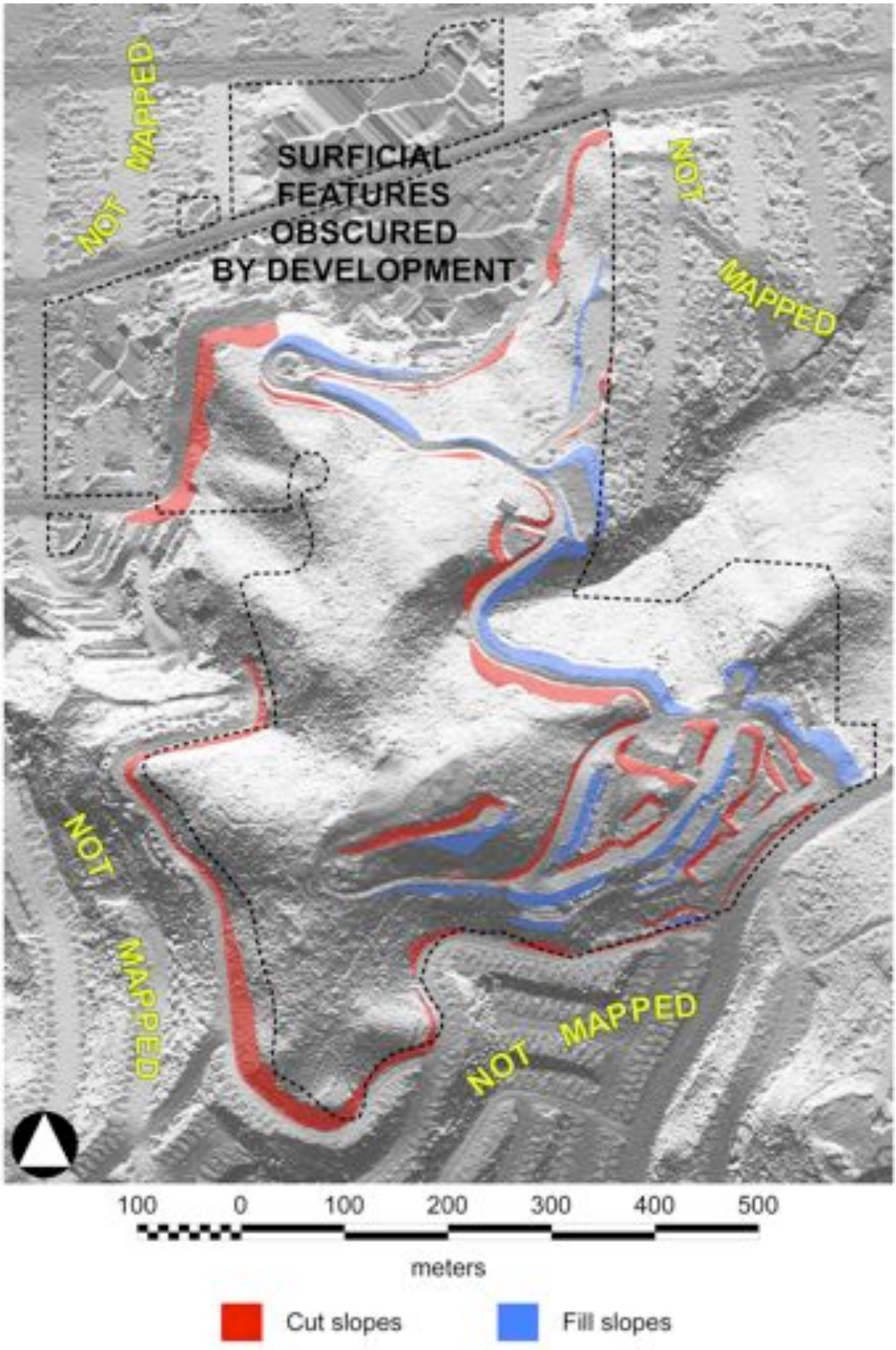
NOT MAPPED
SURFICIAL FEATURES OBSCURED BY DEVELOPMENT
NOT MAPPED
NOT MAPPED
NOT MAPPED
NOT MAPPED
100 0 100 200 300 400 500
meters
Cut slopes
Fill slopes

Figure 7

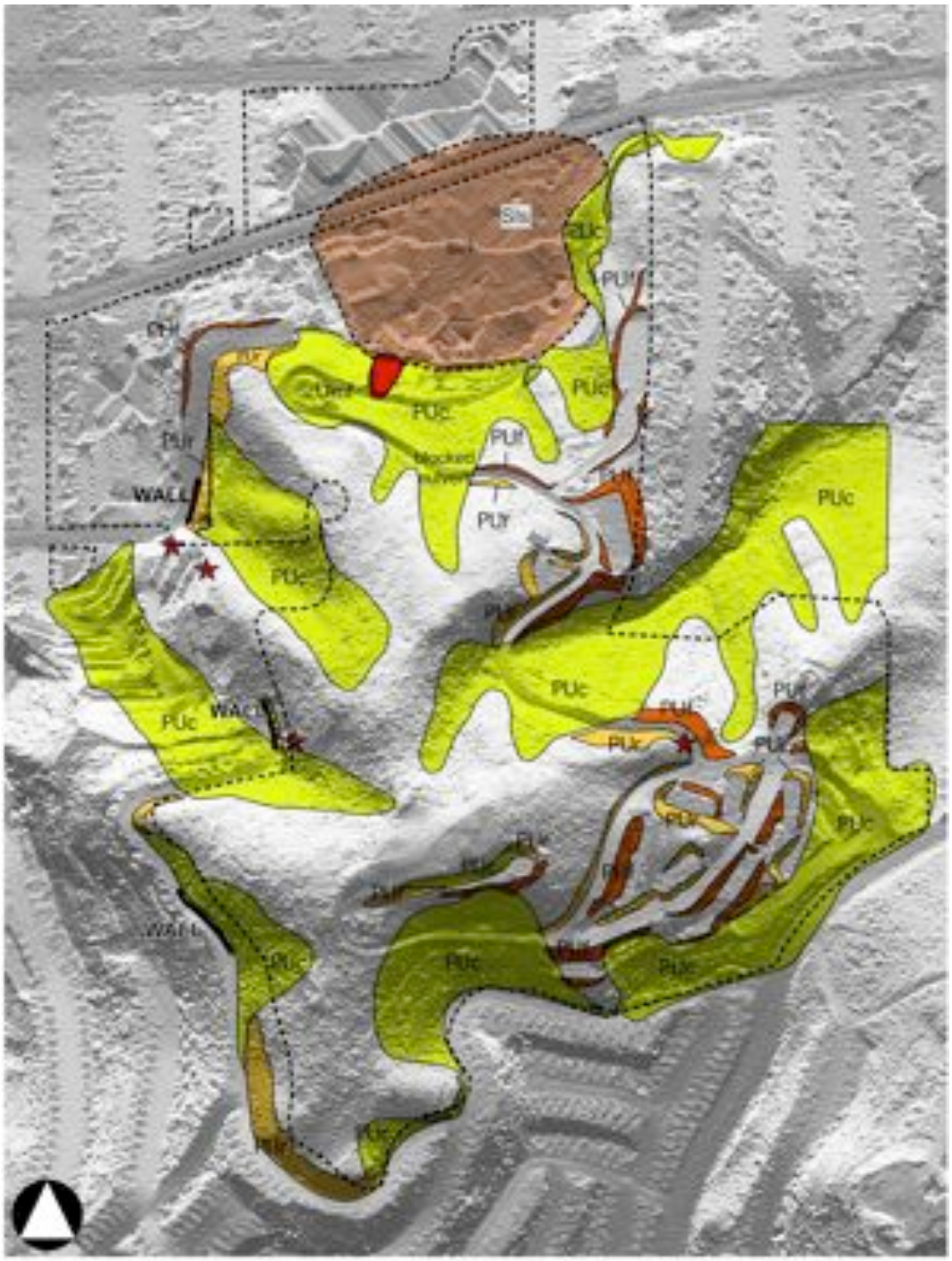
100 0 100 200 300 400 500
meters
Unstable: evidence of recent, current, or likely future movement (Umf)
Unstable: evidence of recent, current, or likely future movement (Ur)
Potentially unstable colluvium (PUc)
Potentially unstable cut slopes in rock (PUr)
Potentially unstable fill slopes (PUf)
Possible dormant landslide (Sls)

Figure 8

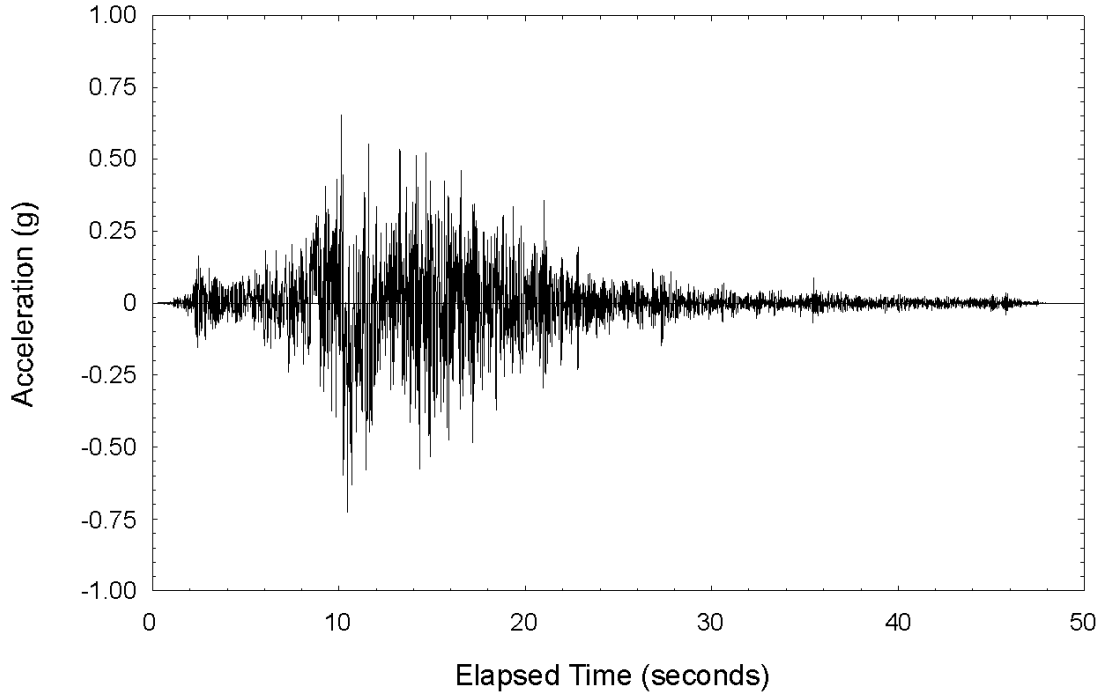
1.00
0.75
0.50
0.25
0
-0.25
-0.50
-0.75
-1.00
Acceleration (g)
0
10
20
30
40
50
Elapsed Time (seconds)

Figure 9

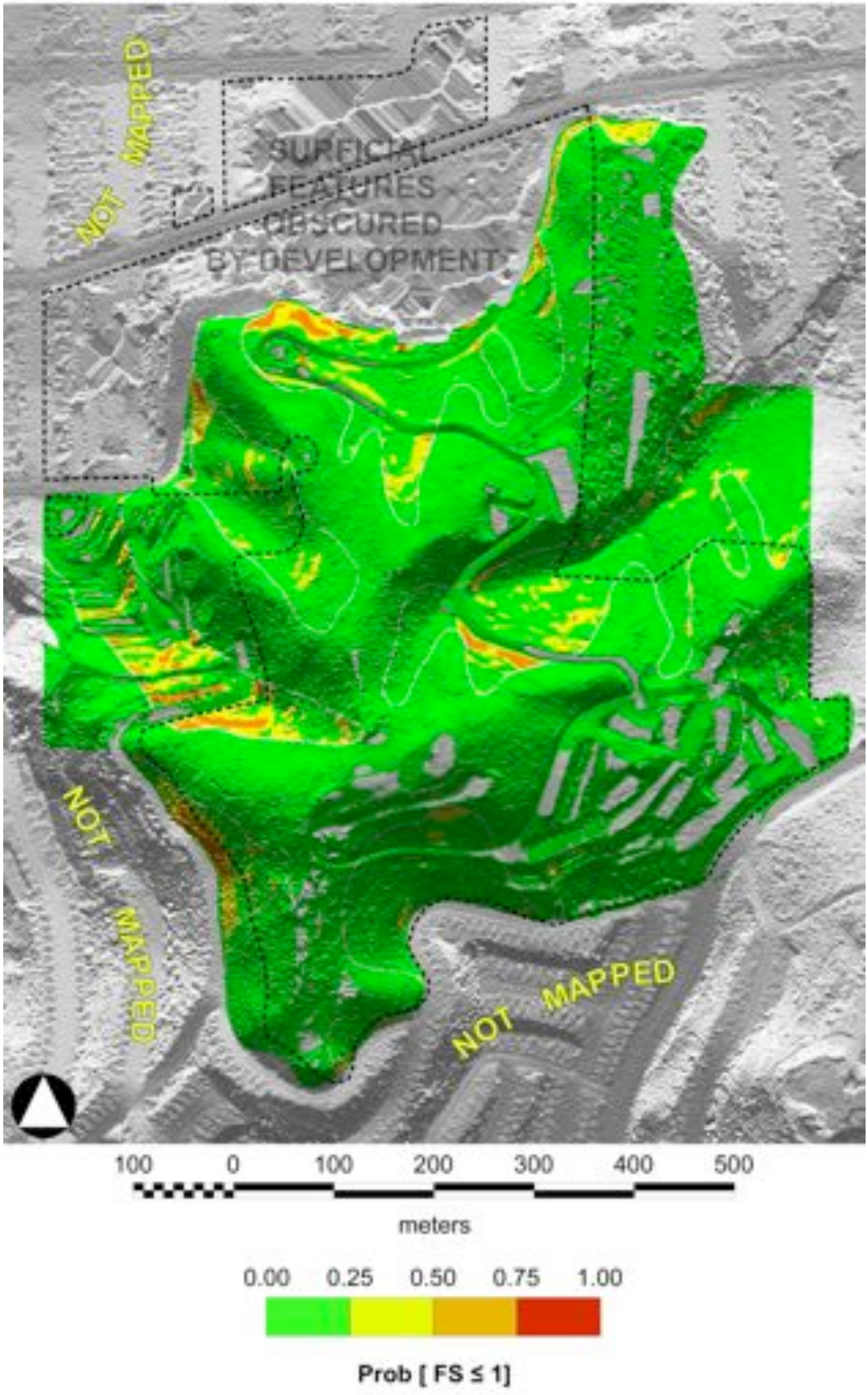
NOT MAPPED
SURFICIAL FEATURES OBSCURED BY DEVELOPMENT
NOT MAPPED
NOT MAPPED
100 0 100 200 300 400 500
meters
0.00 0.25 0.50 0.75 1.00
Prob [FS ≤ 1]

Figure 10

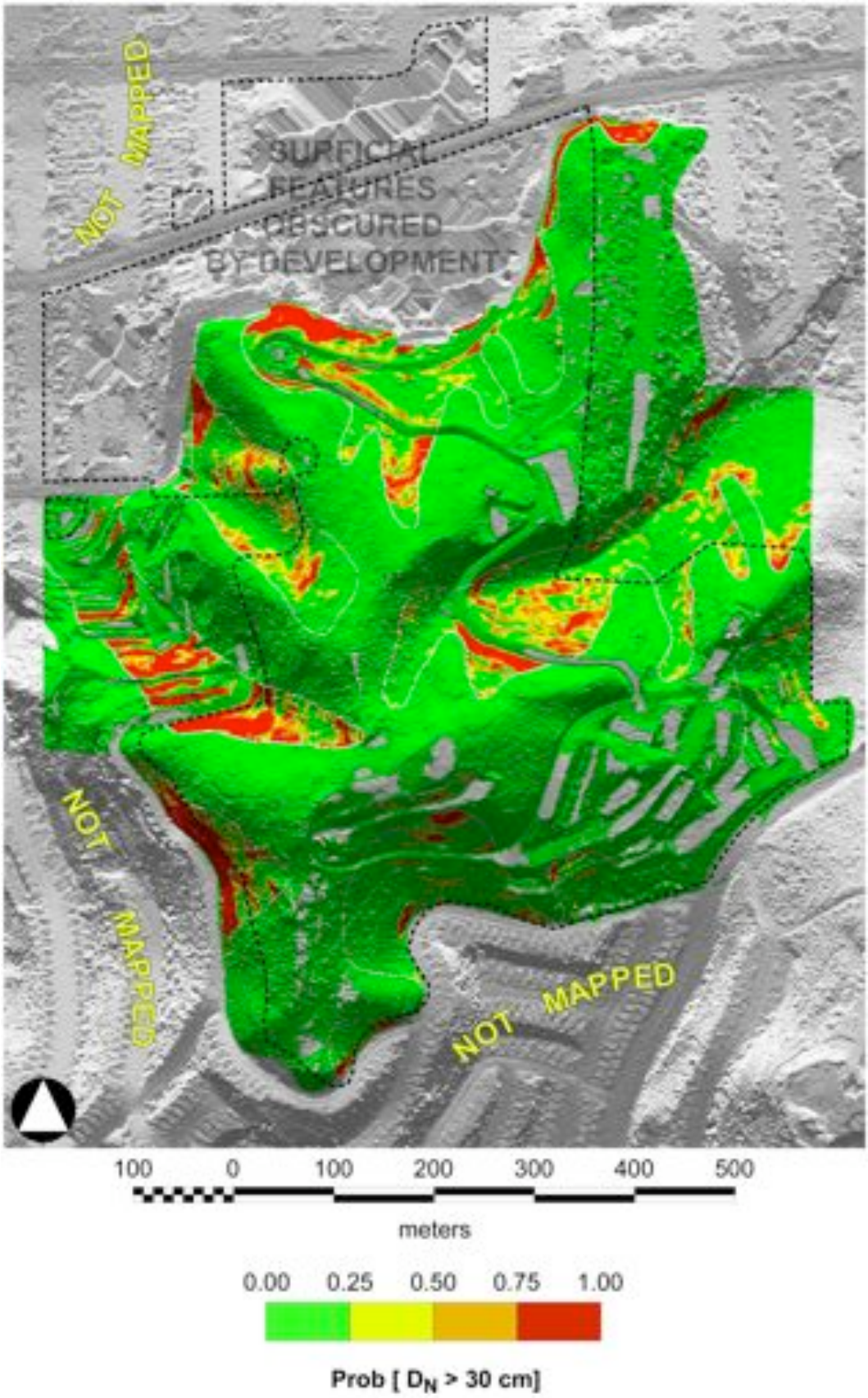
NOT MAPPED
SURFICIAL FEATURES OBSCURED BY DEVELOPMENT
NOT MAPPED
NOT MAPPED
100 0 100 200 300 400 500
meters
0.00 0.25 0.50 0.75 1.00
Prob [D_N > 30 cm]

Figure 11

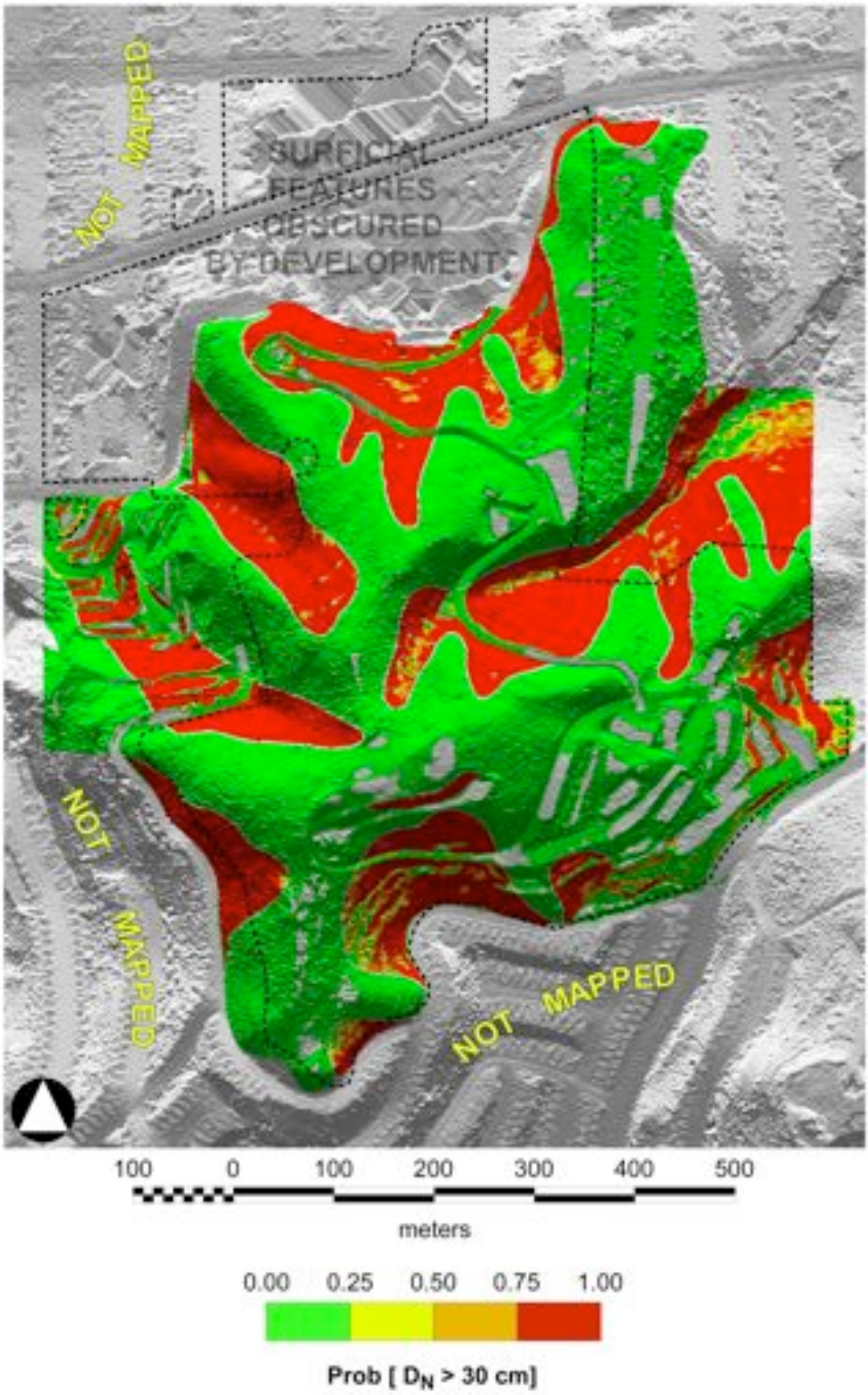
NOT MAPPED
SURFICIAL FEATURES OBSCURED BY DEVELOPMENT
NOT MAPPED
NOT MAPPED
100 0 100 200 300 400 500
meters
0.00 0.25 0.50 0.75 1.00
Prob [D_N > 30 cm]

Figure 12

From:	Linda
To:	Campus Planning - EIR
Subject:	NOP/Initial Study
Date:	Friday, February 7, 2020 3:08:20 PM

Mrs Wong,

As a property owner on 5th Avenue and Parnassus, I feel the expansion UCSF Campus in the Mt Sutro area will bring a major impact to the residents living directly across from the campus on 5th Avenue and surrounding area. Not only will the on going construction of a new dental building squeezed into the corner of Parnassus & 5th Avenue have an impact with construction, noise and delays; but, also all the underground work that will need to take place as well. This will have an adverse affect on peoples daily lives and their right to quiet enjoyment of their space.

Furthermore, with the expansion of the "opportunity sites" on the Mount Sutro hillside there will be even more traffic. The creation of 4th avenue on the campus side which currently does not go all the way through to 5th avenue will increase traffic and be a hazard to the neighborhood.

I would like to see a much smaller attempt to modernize this campus without jeopardizing all who live close by. The traffic be it foot or vehicle will for sure increase with the doubling of the Parnassus on campus residents. The local public transportation will also suffer with the increase population.

In conclusion, I am not in favor of this scale of an expansion and hope that my concerns are heard and considered.

Thank you,

Linda H Rich

Karl H. Lutkemuller trust
1411 5th Avenue, San Francisco, Ca 4122

From:	Vincent Cardillo
To:	Campus Planning - EIR; Norman.Yee@sfgov.org
Subject:	UCSF Development Plan
Date:	Saturday, February 8, 2020 2:44:18 PM

To Whom It May Concern:

1. How are you planning to mitigate air quality impact?
2. https://48hills.org/2019/10/ucsfs-secret-plans-to-expand-dramatically-in-parnassus-heights/

You need to slow down the planning process, and allow for more community input. Please let me know if you have any questions, and how you will be slowing down this process to involve the community.

Sincerely,
Vincent Cardillo
Kirkham Heights Resident

Scoping Meeting for the Proposed Comprehensive Parnassus Heights Plan Environmental Impact Report

Public Comment Form

2/10/2020

Thank you for coming tonight. UCSF values your input, and we welcome your comments on the Initial Study for the proposed Comprehensive Parnassus Heights Plan. This comment form is provided for your convenience. Please return this card to UCSF staff at the end of the meeting, or if you prefer to send it to us at a later date, please email to EIR@planning.UCSF.edu or mail to Diane Wong, UCSF Campus Planning, Box 0286, San Francisco, CA 94143. Comments must be received by 5 p.m. on February ~~14~~ 21, 2020.

1) the hospital bldg is Too big & too close to Edgewood residents.
2) It needs to be lower! We do not want to look out our windows & back yards & see hospital lights on 24 HRS. in patient rooms
3) Green space is very impt & should NOT be encroached upon. the Sutro Forest hiking trails need to remain
4) Red cert soil is very fragile & will collapse w/ huge bldg.

Name Lou Ann BAUER

Address 83 FARNSWORTH LN SF 94117
Street Zip

Email LOUANN@BAUERDESIGN.COM

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR scoping comment on HIPPA, containment facilities, individual offices
Date:	Tuesday, February 11, 2020 10:53:52 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

Please analyze your plans with respect to current HIPPA requirements, containment facilities, and individual office spaces.

UCSF's mission is education, research and patient care. Yet your plans appear to emphasize style and social interaction. UCSF has labs, containment units, and yes, a morgue.

The facility needs to be designed with regard to patient privacy and HIPPA requirements.

There need to be containment facilities, and there need to be offices, not cube farms.

UCSF a hospital, not a convention center!

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR scoping comment on HSIR bldgs. shear strength
Date:	Tuesday, February 11, 2020 11:01:41 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

Please analyze the susceptibility to landslide impact on the HSIR buildings and the buildings' ability to withstand these shear forces.What is the shear strength of these buildings?

The Parnassus property is riddled with landslide risks. See the Haneberg Lidar study for more details.

The HSIR buildings appear to be located in a large swale on the foot of an old landside. It is proposed that these buildings be renovated.

In an earthquake these buildings will be shaken by vertical and horizontal forces through their foundations, but they may likely be subject to lateral forces from Mt. Sutro landslides.

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR scoping comment on seismic forces on Med. Bldg 1, Millberry, and the library
Date:	Tuesday, February 11, 2020 11:10:20 PM

Dear Ms. Wong,
Thank you for including the following comment in the EIR.
Pam Hofmann

On the north side of Parnassus there are three structures: Medical Building 1, Millberry Union, and the library.

Please analyze the vertical and lateral seismic forces from both the ground and from the side of the hill (Mt. Sutro) on the three current structures: Medical Building 1, Millberry Union, and the library.

The library, Millberry, and Medical Building 1 lean up against the mountain. This means that in the event of an earthquake these buildings will be subject to two sets of forces. There will be vertical and lateral forces on their footing, AND at the same time these buildings would also be subject to different vertical and lateral forces coming from the hill.

Remember that the Northridge quakes demonstrated the risk to parking garages. They pancaked. Garages similar in construction to UCSF's are susceptible.
Putting a skin over the parking structures will do nothing. It's lipstick on a pig. Putting more weight on top only increases the risk.

A lot of recently built large structures look beautiful, but are unsound. Consider the Trans Bay Terminal, The Bay Bridge, the Oroville Dam Spillway. And let's not forget the Millennium Tower.

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR scoping comment on contaminated soil
Date:	Tuesday, February 11, 2020 11:18:33 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

Please analyze where the dump trucks of soil from the site will be unloaded.

Please analyze where the dump trucks will be unloaded if it is determined that the soil has been contaminated.

It is probable that UCSF has a significant amount of contaminated soil. As an example of the difficulty of getting rid of this soil, there have been cases where no one locally would take such loads, and the soil had to be trucked as far as Utah before it was unloaded.

Disposal of contaminated soil is a significant issue.

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR scoping comment on dewatering tanks, pumps, and filtration tanks
Date:	Tuesday, February 11, 2020 11:21:27 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

Please analyze the number of dewatering tanks, pumps, and filtration tanks necessary for these projects. Please include the plans for excavation and use (duration and lay down area (where they will be located).

Please give an acoustical analysis for the use of the dewatering equipment ("Baker Pumps") which will be going 24/7 for the duration until foundations are dug and pored approximately a year and a half for each project.

Please analyze the use of sound enclosures tested to meet Contractors Pump Bureau (CPB) Standards.

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR scoping comment on water resources, pump stations, reservoirs
Date:	Tuesday, February 11, 2020 11:28:22 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

Please analyze the impact that the proposed expansion will have on existing water resources, including pump stations and reservoirs.

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR scoping comment on the impact on parking and traffic, include during peak usage
Date:	Tuesday, February 11, 2020 11:35:38 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

Please analyze the impact that the proposed increase in pedestrian, bicycle, and vehicle traffic will have on existing parking, both street parking and UCSF garage parking.

Please analyze parking with respect to peak usage during the work week, on weekends, and during major events in Golden Gate Park.

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR scoping comment on structural vulnerability to damage from ground motion
Date:	Wednesday, February 12, 2020 12:07:48 AM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

Please analyze the effect of ground motion on each of the UC Parnassus structures.

Please list in order which structures are most vulnerable.

Please list the damage to individual buildings from the Loma Prieta quake and from the 1957 Daly City quake.

The 1957 San Francisco earthquake (also known as the Daly City earthquake of 1957) occurred on March 22 at 11:44:22 local time with a moment magnitude of 5.7 and a maximum Mercalli Intensity of VII (Very strong). This was the largest earthquake on the Peninsula since 1906.

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR scoping comment on wildfire in the WUI
Date:	Wednesday, February 12, 2020 12:19:53 AM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

The 1899 wildfire on Mt. Sutro fire stopped just short of the Affiliated Colleges. The 1934 wildfire was fought by 400 firemen. Fire on Mt. Sutro is a serious issue in this urban environment. What are the UCSF plans for detecting a wildfire and for fighting such a fire when it breaks out?

Despite the decrease in fire hazard by Vegetation Management Plan for the Mount Sutro Open Space Reserve fire hazard will still exist. A few years ago I told a UCSF forester about the 1899 and the 1934 wildfires on Mt. Sutro. He thought about it and responded, “Then we are about 20 years overdue for a massive fire.”

The Mt. Sutro Open Space Reserve and the UCSF campus are a "WUI" ("woo ee")(Wildland Urban Interface). When a wildfire breaks out in the Mt. Sutro Open Space Reserve, it will affect many San Francisco buildings, not just UCSF. The embers from exploding trees will travel through the air and start fires elsewhere.

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR scoping comment on cut and fill risks, necessary tests
Date:	Wednesday, February 12, 2020 12:54:17 AM

Dear Ms. Wong,
Thank you for including the following comment in the EIR.
Pam Hofmann

Please analyze the increased probability of landslide caused by use of cut and fill in the proposed projects.

Please include a detailed analysis of the effect of tunneling, and cut and fill operations on the proposed new service roads from Medical Center way to Fourth Avenue.

Please include which fill material is proposed.

Please consider: soil classification, Atterberg limits, California bearing ratio, Direct shear test, Hydrometer, Proctor compaction test, R-value, Sieve analysis, Triavial shear test, Oedometer test, Hydraulic conductivity tests, Water content tests.

It is likely that the projects will significantly exacerbate an existing environmental condition, ground stability. The proposal to put in three service roads from Medical Center Way to Fourth Avenue is particularly concerning.

Cuts can also intercept zones of groundwater, which can cause problems ranging from nuisance seepage to slope instability. The construction of fills without proper subgrade preparation, drainage, keying, benching, moisture conditioning, and compaction can result in fill settlement or slope failures. Heavy trucks put an extra burden on cut and fills.

There are underground, seasonal rivers that flow off Mt. Sutro. The rock outcropping has red chert which has been labeled highly fractured.
Just the act of cut and fill is a recognized landslide hazard, and tunneling, if it is even possible, is very expensive.

From:	Karen Goodkin
To:	Campus Planning - EIR
Subject:	input for UC expansion
Date:	Wednesday, February 12, 2020 5:55:27 PM

I'm a neighbor living on 2nd Ave. in the shadow of UC.

As it stands now, crossing both Irving and Lincoln can be tricky and confusing. With more people being brought into the neighborhood, it can only get worse. I hope you address this and actually have a plan to reduce traffic movement and congestion.

There is also a lot of trash on my street from people walking and driving through. More people equals more trash. I would assume that UC would take on increased street cleaning duties because the areas around the campus are going to need more vigilance and attention.
I have lived at this address for 38 years. I care deeply about the safety, cleanliness and walkability of this neighborhood.

Thank you. Sincerely,

Karen Goodkin
1232 Second Avenue

From: Marta Lindsey
To: Campus Planning - EIR
Subject: Comment on EIR initial study.
Date: Thursday, February 13, 2020 8:48:42 PM

Dear Ms. Wong,

I'm a parent of two young children and live right down the block from UCSF Parnassus. I'm a UCSF patient (our whole family is) and my husband has a membership to the gym. We have lived near UCSF Parnassus for almost 15 years and appreciate our proximity to the hospital and consider it a neighbor of sorts!

In learning more about the proposed long-term plan for UCSF Parnassus, I have two concerns.

First, there is nothing in the plan re: improving pedestrian safety at Irving. I walk through the Irving/Arguello intersection 2-4 times every single day, and this intersection is a crash waiting to happen --- and the parking ramp is a big part of this. People drive in and out very quickly, and without regard for all the parts of the complicated intersection. For those approaching from Arguello, many do not even stop at the stop sign before going into the parking lot. I am an extremely cautious pedestrian, and have been almost hit while pushing a stroller twice.

This intersection, as well as the area where people get on/off the trains, needs serious help. I really hope this can be planned for, and ideally addressed much sooner than the timeline of the plan. There are pedestrian improvements mentioned for Parnassus, but I don't understand why this wouldn't happen for Irving, too.

Secondly, the initial study acknowledges that vehicle traffic to the area will increase -- it's unclear by how much, but it could be a lot. This is worrisome considering how much traffic there already is on the streets right around UCSF as people who work at the hospital circle for parking spots and others are dropping off/picking up. This plan needs to include proactive steps to address and reduce traffic, with policies to support alternatives to driving to the hospital.

Thank you for your time.

Sincerely,

Marta Lindsey
1242 2nd Ave.
SF CA 94122
617.833.7654

--

From:	Sarah Price
To:	Campus Planning - EIR
Subject:	UCSF Proposed Expansion and Pedestrian/Neighborhood Safety on Irving
Date:	Thursday, February 13, 2020 1:11:43 PM

Hello!
My family and I are neighbors to UCSF, on Second Avenue near Hugo Street. We are also patients of UCSF, and have received medical care at the Parnassus ED, Mt Zion Pediatrics, and Mission Bay Labor and Delivery and Pediatrics, with another Parnassus specialist visit scheduled soon. We are excited to hear of all the new proposed plans to grow and develop the UCSF Parnassus campus over the next 20 years!

We are excited to see that there are plans including pedestrian safety improvements on Parnassus, there are no plans to do any on Irving, which is currently a highly frequented and frequently dangerous area. The plan states that the plan expansions of the campus will increase traffic to the neighborhood, and yet there is no plan in place to deal with this.

The current intersection of Irving/Carl and Arguello is the highest risk area, and my three children and I have almost been hit by cars on numerous occasions. Cars coming from all directions speeding over the speed limit, blowing past stop signs, no clear right of way with several directions of flow coming together, muni trains that limit view, and especially UCSF employees speeding through and making dangerous turns into the employee parking lot, are some of the most dangerous/frustrating parts.

Please include some strategies and plans to increase pedestrian safety on the Irving side of the UCSF campus. UCSF is a member of a very special neighborhood, and one that also prides itself on its high walkability. As UCSF plans to grow in this neighborhood, please plan to also take care of the residents who live here every single minute.

Thank you for your consideration!!

Sarah, David, Juliana, Violet, and William Price
1229 2nd Avenue

From:	Hans Baldauf
To:	Campus Planning - EIR
Cc:	Sarah Jones; Marian Baldauf; Jim Sandler
Subject:	Items to be considered
Date:	Friday, February 14, 2020 6:29:39 PM

To the University of California San Francisco regarding scope items that need to be studied on the Master Plan.

These in addition and augmenting the requests made by me at the meeting this past Monday evening.

First, I have not received official communication that the comment period has been extended. At the meeting we were told that it would be extended to the 21st. This is still woefully inadequate as the plans that have been shared with us are incomplete and the University acknowledged at the meeting on Monday are evolving. How can we know what the right questions to ask are. There should be a complete plan presented for us to consider our questions and a new scoping meeting.

Second the plan is assuming a massive increase of the cap in square feet that the University agreed to in the 1970s. Any plan studied must include an alternative that does not violate this cap. This alternative must study all the other locations that the University owns or could acquire in San Francisco. The rational for the Mission Bay Campus was based in part on the need to honor the cap.

Third
The physical construct of the existing campus provides low scale buffer zones of forest and low scale buildings to transition taller buildings to the neighboring residential fabric. A design alternative that studies how these transition zones must be studied.

Fourth
The firm preparing the EIR said they planed on using portions of the past EIR in this EIR. The very fact that the University is proposing a massive new master plan so soon after the last one suggests that everything has changed so no old studies should be used and every study must be new.

Fifth
Transportation impacts need to be fully analyzed. Any additional traffic impacts that cut through the forest preserve must be studied for their environmental impacts as well as their other impacts.

I will continue to review the materials which I fear are very incomplete and try to provide additional requests for study.

Thank you.

HANS BALDAUF
FAIA / LEED AP
Principal

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From:	Roger Hofmann
To:	Campus Planning - EIR
Subject:	EIR comment: Drought availability of water for the Parnassus Heights campus
Date:	Friday, February 14, 2020 3:56:08 PM

Dear Ms. Wong,

In the most recent drought San Francisco instituted a mandatory 25% reduction in water use. SF PUC projections suggest that a 40% reduction in water use may be required in a future drought. The State of California seeks to reduce our use of Hetch Hetchy water. It may be challenging to fully replace this water supply source.

In light of the necessity of water for all UCSF activity, it is important to analyze UCSF's water needs and water availability in conjunction with planned expansions.

1. Please analyze the Parnassus Heights campus' ongoing water requirements in conjunction with construction and new development.

2. If at all possible, a memo of understanding with the SF PUC that guarantees UCSF priority delivery of water during drought conditions would be optimal. As part of the EIR process, please engage in discussions with the SF PUC regarding water delivery guarantees, most particularly in the event of drought.

3. Should the campus' water requirements exceed delivery guarantees, please analyze how the campus will obtain sufficient water to operate, or how insufficient water would degrade operations.

Best regards,

Roger Hofmann

From:	Sunil Paul
To:	Campus Planning - EIR
Cc:	Mera Granberg
Subject:	Comment on the UCSF development plan
Date:	Sunday, February 16, 2020 12:04:25 PM

Hi - We are neighbors at 150 Edgewood Ave. We attended the public comment meeting and have additional input.

We believe more, denser housing helps the major problems of our day: climate, equity, homelessness, and distribution of wealth. We are happy to stand up publicly to support these beliefs at future meetings (we had to leave early from the last one).

We would very much encourage two changes:

1. Make the housing more dense, higher, more expansive and find a way to make it affordable for workers at the hospital, not just students. For example, why add higher cost units up top with the amazing views and balance it with more affordable units in the same building?

2. Consider moving the housing (or the open walkways) to earlier in the process to provide a win for the community sooner than later.

Thanks for your consideration of these things -- also, if the EIR is not the right place to consider them, please forward this email to whoever the right person would be.

best,

Sunil and Mera Paul
150 Edgewood Ave

Sunil Paul sp@sunilpaul.com I aspire to check email once a day - text if urgent
Linkedin Blog Twitter ... what I'm up to ... subscribe to occasional emails

From:	Roger Hofmann
To:	Campus Planning - EIR
Subject:	EIR comments regarding ride sharing
Date:	Sunday, February 16, 2020 2:51:40 PM
Attachments:	Comments ride sharing.pdf

Dear Ms. Wong,

At the scoping meeting Uber and Lyft were mentioned by name as beneficiaries of space that the CPHP will reserve for their use. In the attached document I request analysis of several issues raised by this plan.

Best regards.

Roger Hofmann

CPHP comments regarding ride sharing

During the scoping meeting for the Comprehensive Parnassus Heights Plan, private ride sharing companies Uber and Lyft were mentioned by name. We have been informed by your architect's comments that the CPHP will include pick-up and drop-off locations for use by these ride-sharing companies.

This strongly suggests that the CPHP assumes service from these companies will remain available in the long term and their level of service will be comparable to the services available today. If, for some reason, these companies falter, there is an implicit assumption that comparable replacements can be found.

These assumptions need careful analysis in light of the following facts:

Neither company has achieved financial success. Uber lost at least $3 billion EACH YEAR for the past four years, including a stunning $8.5 billion in 2019 as cash received from its initial public offering was showered on insiders. Uber's current balance sheet shows "Current Assets" (assets that can be converted to cash in a reasonable time frame) at $14 billion. At its current financial trajectory **Uber will run out of cash before Phase One of the CPHP is complete**.

Lyft offers a similar cautionary tale. Each year in the past four it lost more money than the year before. In its "best" year, 2016, it lost "only" $682 million. Like Uber, money from its initial public offering was sprayed at insiders – last year Lyft lost $2.6 billion in part due to its largesse with insiders. On Lyft's balance sheet "Current Assets" are shown as $3.2 billion. Like Uber, **Lyft must make changes within the next few years to survive**.

Neither company has a stellar record of corporate ethics. Uber in particular has a sorry history, including **sexual harassment in the workplace, flouting local authorities and active deception of regulatory attempts**. Web search "Uber greyball" for details of one such effort.

The drivers from both companies may refuse rides. It has come to light recently that this policy results in a high refusal rate in minority neighborhoods. **This is a form of redlining**.

In consideration of these facts, the explicit mention of these companies by name at the scoping meeting and their presumed role in the CPHP, please analyze the following:

1. Please analyze whether in the long term private company ride sharing will exist as a viable transit option for the UCSF community. Please take into account that under new California law drivers will likely be converted from contractors to employees.

2. As part of this analysis, please estimate ride prices that will allow Uber and Lyft to remain as "going concerns" in San Francisco in the long term and the impact these prices will have on potential UCSF users – will higher ride share prices convert some users back to private automobile use? If so, how many additional automobiles could be expected, and what is this impact on traffic and parking?

3. Considering that many ride share drivers do not live in San Francisco, but drive many miles to provide service here, please analyze vehicle miles traveled (VMT) under two scenarios: (A) Your baseline assumptions of ride sharing by the UCSF Parnassus Heights community; and (B) The ride sharing users in scenario (A) use private automobiles instead. In other words, do the ride sharing companies increase or reduce VMT compared to private automobiles, by how much, and what is UCSF's impact on VMT in both scenarios?

4. Please analyze whether the corporate ethics and behavior of Uber and Lyft are compatible with UCSF's ethical standards and whether even an indirect association with these companies is an acceptable affiliation for UCSF.

Thank you for considering these comments.

Best regards,

Roger Hofmann

From: Maria Wabl
To: Campus Planning - EIR
Subject: EIR comments
Date: Sunday, February 16, 2020 1:35:55 PM

Hello Diane,

Please include the following comments into the EIR analysis:

EIR comment 1:
Please analyze the parking situation on the newly planned Parnassus Campus:

- At least one parking deck is going to be removed from the parking garage for the "grand terrace" (about 50 spaces?)
- The Surge parking lot is supposed to be given back to the Mount Sutro Reserve, 20 parking spaces will be eliminated
- The Dental School will be torn down and 4th Ave will be created. All parking spaces in the Dental School parking lot will be eliminated

Where will be new parking spaces created. Even if the vision of UCSF is to get rid of all cars in the near future, UCSF has a lot of faculty and employees with parking permits who come from the suburbs and from further away who are still dependent on cars. UCSF is a hospital with patients coming from as far as Fresno and so on. Especially it should be kept in mind that even if there are less cars in the city of SF, patients come from rural areas and are sick and they will for sure come by car.
How is USCF mitigating the huge growth of the Campus and daily population with decreased Parking?

EIR comment 2:
Please analyze the wildfire Issues in the area around Mount Sutro:

- I recently talked to my home owners' insurance and they notified me that we are in a Fire Zone 2. We live right next to Mount Sutro on 1515 5th Ave.
- After devastating fires in the wider Bay Area last year and the year before….
- This should be reason enough to seriously look at wildfire responses and plans and mitigation!

EIR comment 3:
Please analyze the wind impacts created by the demolition of the School of Nursing:

- Having lived in the immediate area for 30+ years, having walked Koret Way on a weekly basis, having spent hours in Sanders Court I am appalled by the fact that the nursing school, which was not even mentioned in the LRDP2014 that it doesn't meet earthquake requirements anymore, is going to be demolished now.
- The nursing school serves as a wind breaker so that Sanders Court can be enjoyed every now and then when the weather allows
- Now UCSF is going by aesthetics and is creating a "wonderful promenade" parallel to Parnassus Ave, which is the windiest street in all our neighborhood.

EIR comment 4:
Please analyze the 40% overage of square footage of the UCSF campus compared to the planned square footage use in the LRDP 2014

- Why are the buildings that were deemed for demolition in the 2014 LRDP no longer being torn down in the time frame given in 2014. This was to mitigate the overage in square feet even then.
- How will transportation be mitigated with 4000 more people on campus and the same neighborhood streets
- How will parking be mitigated if parking spaces are taken away and there is no plan for new UCSF parking spaces?
- How will the neighborhood be able to protect the street parking places which are diminished also by the city with bike racks and color?
- How can UCSF go over the space ceiling this much with a legally binding document in place to stick by the space ceiling?

EIR comment 5:
Please analyze the impact of UCSF not building any housing on campus as it was planned for in the 2014LRDP:

- How can UCSF justify not to build housing on campus as planned in the 2014 LRDP when San Francisco is in a housing crisis and UCSF is planning to add a lot more people on this campus, but does not help to improve transit or parking?
- What impact will more housing needs have on the immediate neighborhood.
- How many extra people on coaches will the neighborhood have to swallow? How does UCSF plan to mitigate this?
- Why is housing not built first on campus and then the campus is being overhault?

EIR comment 6:
Please analyze how the noise of construction planned will impact the neighbors and their sleep patterns:

- How is UCSF planning to mitigate the construction noise in the different areas of campus?
- How does UCSF plan to keep the number of trucks under control and the times they are coming to the construction areas?
- Will UCSF with this construction follow work hour guidelines without having something going on almost every weekend and in the early morning hours?

EIR comment 7:
Please analyze the noise of construction traffic on the immediate neighborhood?

- How is UCSF planning to mitigate the extra traffic from workers and construction vehicles and their noise?
- How can the immediate neighborhood keep their life quality with constant nuisances?
- How can you mitigate neighbors not getting sick over not getting any rest during construction especially concerning noise?

EIR comment 8:
Please analyze the impact of deep drilling and demolition of buildings on the housing stock in the immediate vicinity of UCSF:

- How is UCSF going to mitigate the vibration from drilling deep into bedrock for the housing stock around the construction sites?
- How is UCSF going to mitigate the construction impacts concerning falling debris and construction material on the surrounding housing stock?
- Is UCSF going to accept claims after houses in the neighborhood are damaged?

EIR comment 9:
Please analyze the Air quality problem arising from demolishing the proposed buildings:

- How is UCSF planning to protect the neighbors, patients and workers from all the dust and hazardous materials in the older buildings being demolished especially with wind patterns and changing weather conditions?
- How is UCSF going to make sure that hazardous materials are discovered beforehand and not during demolition as a surprise?

EIR comment 10:
Please analyze the noise levels (meaning constant levels) with all new roof utilities and generators being installed

- How is UCSF planning to mitigate the extra new constant noise levels being created by all kinds of utilities and roof installations as heating devices …….
- How is UCSF planning to mitigate those noise creating background noises that will be increasing….

Please do not suggest to the neighbors to invest millions into projects for the community rather mitigate the project so that it allows us neighbors to continue to live in this neighborhood with a decent life quality!

Thank you for adding my comments onto the record and analyzing them.

With best regards,
Maria Wabl
1515 5th Ave

From:	Denis Mosgofian
To:	Campus Planning - EIR
Cc:	Dean Preston; Norman Yee
Subject:	2 Comments on Notice of Preparation of ER
Date:	Monday, February 17, 2020 8:05:35 PM

February 18, 2020 **Comment 1**

Diane Wong

UCSF Campus Planning

re: January 14, 2020 Notice of Preparation of Environmental Report and Initial Study for UCSF's Comprehensive Parnassus Heights Plan

Population:

Please stop using the misleading 2050 as the date of the net population increase, when 74% of the estimated 7,900 (= **5,846**) in population is expected to occur in 2030 (p. 13)

Please confirm that the projected daily population increase of **5,846** above 17,400 (2018) by 2030 includes all expected daily personnel and typical outside contractors, as well as expected visitors, and the 7,900 by 2050 above 17,400 also includes all daily personnel and typical contractors.

Please analyze the cumulative impacts from the 5,846 projected 2030 population increase on affordability and availability of nearby Inner Sunset & Cole Valley housing and analyze the displacement pressures on the existing residents in those areas during the decade 2020-2030.

February 18, 2020 Comment 2

Diane Wong

UCSF Campus Planning

re: January 14, 2020 Notice of Preparation of Environmental Report and Initial Study for UCSF's Comprehensive Parnassus Heights Plan

Population and Housing:

Cease and desist: The document conceals the real growth rate from 17,400 to 23,246 by 2030 by continually using the population increase to 25,300 by 2050. And this in turn obscures the much more immediate cumulative impacts in this decade on housing, local residential population, VMT, congestion, transportation and public services. **The devil is always in the details!**

Please identify and analyze all possible “alternative campus housing locations for the duration of construction” to which students could be relocated. (p. 41)

Given that the CPHP anticipates displacing Aldea Housing residents without having sufficient other housing for them, **please analyze** just how and where UCSF will be able to move people both on campus and elsewhere, and just where it would seek “construction of replacement housing elsewhere in the City.” (p. 41)

Please analyze exactly why housing could not be built prior to demolition to preclude disruptive and expensive displacement.

Denis Mosgofian
1227 - 10th avenue, 94122

From:	Denis Mosgofian
To:	Campus Planning - EIR
Cc:	Dean Preston; Norman Yee
Subject:	4 Comments on Notice of Preparation of ER
Date:	Monday, February 17, 2020 8:05:36 PM

February 18, 2020 **Comment 3**

Diane Wong

UCSF Campus Planning

re: January 14, 2020 Notice of Preparation of Environmental Report and Initial Study for UCSF's Comprehensive Parnassus Heights Plan

Please analyze the cumulative impacts due to the population increase on public transportation availability, and the increased public costs to the City & County of San Francisco for the decade of 2020-2030, and what financial mitigation UCSF would provide.

February 18, 2020 **Comment 4**

Diane Wong

UCSF Campus Planning

re: January 14, 2020 Notice of Preparation of Environmental Report and Initial Study for UCSF's Comprehensive Parnassus Heights Plan

Transportation, VMT and congestion on Parnassus Avenue:

Please analyze how Vehicle Miles Traveled by staff, faculty, patients and visitors (aka congestion) will be reduced with the **5,846** net increase in daily population by 2030 as articulated on page 13. (5,846 = 74% of 7,900 total projected net increase in daily population which would occur in the Initial Phase to 2030)

February 18, 2020 **Comment 5**

Diane Wong

UCSF Campus Planning

re: January 14, 2020 Notice of Preparation of Environmental Report and Initial Study for UCSF's Comprehensive Parnassus Heights Plan

Please analyze the practicability and safety of proposed drop-off and pick-up area proposed for the new child care facility at the site of the Proctor Building located at the southeast corner of two very steep streets, Kirkham going east and 5th Avenue going south?

February 18, 2020 **Comment 6**

Diane Wong

UCSF Campus Planning

Please confirm that there will be a School of Nursing and identify where the new School of Nursing Building is to be?

Denis Mosgofian

1227 - 10th Avenue, 94122

Dennis Antenore—Comments on Initial Study Comprehensive Parnassus Heights Plan

Please analyze and compare the environmental impacts of the proposed project to a project modified to provide for converting UC Hall to housing as completed in the current LRDP and for the conversion of Moffitt Hospital to housing. Such a modified project would likely greatly reduce the negative impacts of the Plan.

Please analyze the impacts of the project on the New Deal Murals in Toland Hall, in UC Hall. As an important historical resource the demolition of UC Hall threatens the integrity of Toland Hall and particularly the murals.

Please analyze the Wild Fire risks and possible responses regarding the Sutro Forest. In 2015 the San Francisco Fire Marshall concluded that: "Due to the **EXTRA HAZARDOUS** fire conditions identified during the on-site inspection a 100 foot defensible space work in the Mount Sutro Open Space Reserve is recommended." This is especially important as the Plan contemplates locating a portion of the new hospital as well as other buildings in or adjacent to the forest.

From:	John Caldwell
To:	Campus Planning - EIR; Zane Blaney
Subject:	EIR comments
Date:	Thursday, February 20, 2020 10:54:44 PM

We support UCSF's presence in our neighborhood and its thoughtful expansion to accommodate future needs, but want to voice concerns about negative impacts of the current proposal.

A a new hospital building at the extreme east end of the campus is problematic. Removal of green-space buffer to fit a high-rise building in place of a low-rise one would degrade quality of life in nearby homes. Visual intrusion and shadows are likely but impossible to judge without dimensional renderings. Added noise from roof equipment and deliveries are certain.

UCSF's vehicle traffic is already a neighborhood negative. A particular cause is single-occupant drivers seeking free parking. Your data suggest that two thirds of visitors arrive by car, and that you will be increasing campus space by 30-40%. Transportation-specific plans including reduction of SOV trips--preferably from current levels--need to be part of any expansion.

Thank you for addressing these concerns.

John Caldwell & Zane Blaney
1460 Willard Street

From:	Scott Jacobs
To:	Campus Planning - EIR
Subject:	UCSF Parnassus Campus Initial Study, Notice of Preparation of Environmental Impact Report, and EIR Comments and Concerns
Date:	Thursday, February 20, 2020 2:09:33 PM

To UCSF,

My family has lived at 122 Edgewood Ave in San Francisco since 2008. We have four young children – Skyler (6), Jazper (9), Justin (12), and Jaxon (13). Our home is located adjacent to the UCSF Parnassus campus – our kids can see the campus buildings and hear the noise from the campus power plant through their bedroom windows.

We are extremely concerned that UCSF may have acted in bad faith by initially proposing a project description for new structures/alterations to the UCSF Parnassus Campus, and then making significant/material changes to the project description, height, square footage, density, location, and mass of these structures/alterations at the last second.

Based on these changes, the Initial Study is obsolete, inaccurate, and improperly structured to fully study all of the additional/increased impacts associated with this new, expanded project. The Initial Study was based on UCSFs original project description and scope of work in which the construction of the new hospital building would have been contained within the existing footprint of the University and would only extend to, but not beyond, Medical Center Way. The project documents specifically state on page 9 that, "The proposed New Hospital would be located on the site of LPPI on the south side of Parnassus Avenue between Medical Center Way and Moffitt Hospital." (The related drawings show this same boundary.)

However, the most recent version of the project scope and description proposes a new, radically different plan in which the new hospital building would extend far beyond Medical Center Way, almost to the backyards of the homes on lower Edgewood Ave. This new plan also appears to clear cut a significant portion of the forest to make way for new structures, as well as construction vehicles and parking. The Initial Study clearly doesn't take into consideration these last second, significant changes to the project scope and description (eg. height, square footage, density, location, mass, occupant count, etc) of the new proposed structures/alterations.

If UCSF wants to expand/increase the scope of work and project description as it has recently been presented, then the current Initial Study and Notice of Preparation of Environmental Impact Report need to be redone to accurately reflect the additional/increased potential impacts associated with this project. UCSF needs to redo the Initial Study and run this process in a more transparent and inclusive manner.

Additionally, UCSF hasn't shown the Edgewood Ave residents or community any specific plans, elevations, studies, or renderings for the new proposed UCSF buildings/alterations in relation to the homes on Edgewood Ave, the surrounding community, or the broader city, making it impossible for us to understand the magnitude and severity of the impacts associated with these proposed buildings.

Our concerns about these new proposed buildings/alterations include, but are not limited to, the following impacts:

Air Quality Impacts

- Air quality and human health impacts on the adjacent Edgewood neighbors and community resulting from the construction vehicles traveling to and from the surge lot and project site.
- Air quality and human health impacts from hazardous materials (e.g. asbestos), specifically associated with the demolition of older structures
- Air quality and human health impacts from disrupted hazardous materials located in the soil (e.g. asbestos)
- Air quality and human health impacts from hazardous materials and environmental contamination located in the soil and groundwater, if any, that will be disrupted during demolition and construction
- Air quality and human health impacts related to chronic downwind exposure from ongoing demolition and construction activity
- Air quality and human health impacts related to the removal of trees from the section of Sutro Forest in-between Medical Center Way and Edgewood Ave

Noise Impacts

- Noise impacts from ongoing demolition and construction activities
- Noise impacts from hospital generators, power plants, and other mechanical devices moving closer to residential areas
- Noise impacts from Medical Center Way being transformed into an active street for cars, shuttles, trucks, ambulances, and facility support vehicles
- Noise impacts from the Surge Parking Lot becoming a staging ground for construction vehicles
- Noise impacts from increased ambulance traffic
- Noise impacts from helicopters, if any

Traffic Impacts

- Increased neighborhood-level traffic impacts around the Parnassus Campus as well as city-wide traffic impacts resulting from the increase in cross-town vehicular travel to and from the Parnassus campus (during peak and non-peak hours) and the increased occupant count at the Parnassus Campus.
- Increased impact on neighborhood-level parking supply resulting from the increase in vehicular travel to and from the Parnassus campus

Housing Impacts

- Housing-related impacts (affordable and otherwise) resulting from increased occupant count at the Parnassus Campus.

Infrastructure Impacts

- Water, sewer, power and other impacts resulting from inadequate, undersized city and utility infrastructure

Geological and Natural Resource Impacts

- Geological impacts from demolition and construction activities (eg. increased erosion,

landslides, flooding, water runoff, etc) from the disruption and alteration of the hillside
- Geological impacts to natural resources (eg. Serpentine rock formations)

Neighborhood Character Impacts

- The height, square footage, density, and mass of the new proposed UCSF buildings are totally incongruous with the character, height, square footage, density, and mass of the structures in the surrounding neighborhood. This will permanently alter, impact, and scar the character of the surrounding neighborhood.

Cushioning Impacts

- Impacts associated with UCSFs potential violation of its 2014 neighborhood agreement, in which UCSF agreed to implement “cushioning” actions to offset the intensification of use of existing property.

While I recognize the need for additional hospital capacity in San Francisco, this project scope and process as currently conceived is extremely flawed, in violation of CEQA goals and requirements, and needs to start over from the beginning. UCSF should also seriously consider alternative sites/locations for this new hospital.

Sincerely,
Scott and Jing Jacobs

122 Edgewood Ave.
San Francisco

From: Sarah Jones
To: Campus Planning - EIR
Subject: Comments on Environmental Impact study of UCSF Parnassus Campus expansion
Date: Thursday, February 20, 2020 9:25:30 PM

Dear UCSF,

I live at 190 Edgewood Ave. and have recently become aware of the extent of the plans to expand the UCSF Parnassus Campus. While I have been aware of the planned construction, I did not realize the extent to which it would transform the Parnassus Campus, nor that UCSF is considering altering the current footprint of the existing campus.

My major concerns are mainly clustered around

Transportation/Traffic/Parking: Parnassus Avenue is one of three roads that run from Stanyan to the Inner Sunset. We rely on it daily, as do many bus lines, and its closure, permanent or temporary, will reroute a huge amount of traffic to the remaining two roads, rendering them congested and therefore more dangerous.

Also, after the construction is finished, UCSF expects an additional 4,000 to 7,000 additional people to be on campus on a daily basis. This will greatly affect traffic, transportation and parking in the area, not to mention the pressure this new population will put on the surrounding streets and highways of San Francisco. It is disingenuous to believe public transportation will bear the burden of these new workers and patients. I don't see how whatever additional parking UCSF builds will make up for the new needs.

Noise: Again, my concerns are about both construction noise, and the noise of the hospital after construction. We have heard from neighbors on 5th Ave. that the construction vehicles for previous UCSF building projects have begun as early as 3am. If UCSF builds the new hospital on the east side of the Parnassus campus, and uses the Surge Lot for construction parking, I am very worried the construction noise will be waking up our neighborhood at 3am for the (decades-long) duration of the project.

Likewise, after the hospital is built so close to, and perhaps across, Medical Center Way, I worry that the noise of the hospital's generators and HVAC will be much louder than the current system. We on Edgewood are lucky to have the barrier of the mountain and the trees of Sutro Forest to somewhat mitigate the noise from UCSF, but with the Hospital moving to the outer edge of Medical Center Way, and rising significantly higher into the air, these noises will become much louder and harder to ignore.

Massing on Parnassus: The current UCSF Parnassus Campus begins mostly low at both 5th Avenue, and Medical Center Way and grows higher towards the center of the campus. With the current design, huge new buildings will be built on the extreme ends of the Parnassus Campus, looming as you come west and east on Parnassus. The new construction's impact on the neighborhood will be much greater than if the construction took place in the heart of the campus instead of on the edges.

Geologic stability: There have been multiple instances over the past several decades of rockslides and mudslides in Sutro Forest. A little more than a decade ago, one side of the Surge Parking Lot slid down the hill. When the added weight of 1.5 Million square feet of

new buildings, not to mention construction vehicles, are added, I am worried that the stress on the geologic substrata will lead to further and increased instability of the hillside. The current EIR has not adequately addressed that potential instability. In addition, the potential widening of Medical Center Way will put added stress on the hillside to the west of Edgewood Avenue, potentially contributing to instability of houses on the street.

Destruction of part of Sutro Forest: The EIR does not adequately address the impact of widening Medical Center Way into Sutro Forest. The proposed EIR posits that because forest torn out of the hill to the east of Medical Center Way will be replaced (decades later) in a different place, that the impact of the planned deforestation for the widening of Medical Center Way is negligible. This is absolutely ridiculous, as the forest contains several native species that will be destroyed, and is used heavily for recreation by neighbors and visitors to the area. In addition, the forest to the east of Medical Center Way contributes profoundly to the mitigation of noise and air pollution from UCSF to the neighbors of Edgewood. (Also see Geologic Stability.)

Thank you,
Sarah Jones

From:	Irene Lee
To:	Campus Planning - EIR
Cc:	Sarah Smith Jones
Subject:	concerns regarding UCSF expansion from Edgewood Avenue resident
Date:	Thursday, February 20, 2020 3:41:05 PM

To the University of California San Francisco regarding the recent EIR meeting:

I am a resident and homeowner on 235 Edgewood Avenue. Last week our neighbors on Edgewood attended a meeting to review the latest EIR, and found that the EIR was not entirely relevant as the Master Plan for the campus expansion has been altered to expand the square footage significantly. My understanding is that this expansion will have a direct impact to the neighborhood due to noise, shading, traffic and alteration of the forest/greenbelt areas. As a resident, I am quite concerned, and would like to see a study of how the new plan affects each of these factors.

My questions include the following:

1. How much of the greenbelt/trees between Medical Center Way and Edgewood plan to be altered, and what would the affect on air quality and noise be by removing this buffer?
2. With construction occurring so close by, what old (and potentially hazardous) materials will be removed, and how do you plan to address protecting air quality to our neighborhood?
3. How close and large will hospital generators and other noise-producing sources be to the neighborhood? How will this affect us?
4. Will you be updating surrounding water, sewage and power lines and other infrastructure to support the increased demands of the hospital?
5. What will the increased height of the buildings do to shade the neighborhood?
6. What are the plans for the current surge parking lot that is adjacent to our backyard?
7. What other studies have been done regarding impact to existing housing, not just regarding the issues I have outlined?

My understanding is that the deadline for the EIR commenting period is tomorrow, and I do not feel there has been enough time or communication to properly address my and the neighborhood's concerns. My hope is that a full master plan can be shared and a full study done to understand and possibly alter any of these issues.

Sincerely,
Irene Lee
235 Edgewood Ave.

From: Ed Leonard
To: Campus Planning - EIR
Subject: Parnassus Heights Plan EIR
Date: Thursday, February 20, 2020 4:51:32 PM

Ladies and Gentlemen,

I attended the February 10 meeting and am submitting my comments on the scoping for the EIR for the above referenced plan:

I agree with the speakers at the February 10 meeting who voiced their distress at the rushed process. I am glad I was not the only one who got the impression that the University was not intending to take comments from the neighborhood seriously and would push ahead with its plan notwithstanding the devastating effects on the neighborhood. I won't repeat the comments made at the meeting except to note that I agree that the following need to be addressed in the EIR:

- **earthquake** (will the excavation and construction increase the likelihood and magnitude of earthquake damage to existing structures, particularly on the hill to the southeast of Medical Center Way and Parnassus?)
- **toxic emissions and diminished air quality generally** (during the demolition/construction period, from traffic congestion and from ongoing hospital operations),
- **traffic congestion** (the idea that public transportation and the widespread use of autonomous vehicles is capable of reducing the number of cars traveling to the hospital is a misguided illusion and if the University is basing its plan on this, please furnish the studies supporting this belief),
- **noise** (arising from (i) construction, hospital generators moving closer to residential areas, (ii) Medical Center Way becoming an active street for trucks and facility support vehicles, (iii) Surge Parking Lot becoming staging ground for construction vehicles, (iv) ambulances), and
- **housing** for the massive increases in the number of people coming into the neighborhood need to be addressed as do the **deleterious effects of vibration, wind, and the length of the construction period**. In particular, the location of the hospital and its height and scale are completely objectionable and the University should consider relocating it entirely, perhaps to Mission Bay, or to Johnstone Drive where the University has plenty of space and some housing already exists, or perhaps to another county.

It is certainly ironic that a medical organization supposedly concerned with people's health should propose a plan which will have, as two of its principal effects, increasing the risk of injury to its neighbors and making them sick.

In addition, I have three other comments which were not presented at the meeting. There is a steep hill descending from the west end of Farnsworth Lane to Medical Center Way and Parnassus Avenue. There are currently signs posted there by the University warning of the danger to pedestrians traversing the hill. A fence was also placed there several years ago. In general the signs and the fence have reduced the number of people accessing the hospital that way, but with an additional 4,000 people a day going to the hospital and campus, the signs and the fence will almost certainly be ignored, probably resulting in injuries as well as to erosion to the hillside. A chain fence at the entrance of the trail from Farnsworth was ignored and moved so often in the past, it was finally removed by the University. In addition, we have seen people taking smoke breaks on Medical Center Way and there would be a significant risk of fire if people would smoke, or dispose of their cigarettes, on or anywhere close to the hill.

Is the city of San Francisco going to pay for the sewer and water improvements required to service the new hospital and buildings? If not, existing water and sewer services in the neighborhoods may no longer be adequate. And when in the process will the City will make a binding legal commitment to make these and other necessary improvements?

Finally our neighborhood (Edgewood/Farnsworth) will object strongly to the increased foot traffic ascending the Farnsworth steps and accessing the hospital by way of Farnsworth Lane as well as to the increased number of vehicles looking for parking in our already stressed neighborhood.

Very truly yours, Edward Leonard

--

Edward M. Leonard | ed.leonard@gmail.com

UCSF CPHP
Comments on Initial Study for Preparation of DEIR

Dear Ms. Wong:

Thank you for identifying a number of Environmental Effects as categorized under CEQA that must be evaluated in preparing the EIR for the proposed CPHP.

There is a paramount question as to whether a valid DEIR can be prepared based on the limited information in the project description that has been provided to the public to date. The lack of detail makes any analysis subject to revisiting once actual structures; their locations, shapes, sizes and uses are identified. Further the order of each distinct construction project in relation to the others is likely to warrant further study and environmental review at each step.

The 30-year Construction Period

Please analyze the following:

1. **Transportation and Circulation**

   During construction, please analyze the impacts on transportation and circulation caused by tens of thousands of haul trips in and out, removing demolition and excavation material, and delivering building materials and construction equipment. Hundreds of workers will travel to and from the site for the duration. Access to the site is limited. Parnassus and Irving are each on a major MUNI bus or rail route. Parnassus is the access road to the hospital for Emergency Vehicles.

   Please analyze:

   - Impacts on public transit including but not limited to delays;
   - During construction as population grows, and after completion, please analyze the impact of increased population including construction workers on public transit;
   - Potential life-threatening delays of emergency vehicles during construction;
   - Impacts on bicycle safety both within the UCSF footprint and within the impacted local neighborhoods, noting that Kirkham Street carries the primary east/west bike route for the entire Sunset District including the Inner Sunset;
   - Impacts on pedestrian safety. Noise from construction that interferes with the ability of pedestrians to discern where sound is originating and whether it is an approaching vehicle. This may be particularly hazardous for the visually impaired.
   - Impacts on vital access from Irving Street for transit riders and pedestrians, especially those with disabilities, during construction of the new Irving Street entrance'
   - Impact of Vehicle Miles Driven (VMT) by construction workers travelling to and from the site;
   - Impacts on children, parents and employees accessing the Child Development Center while it continues to operate prior to demolition.

- Will there be a staging area off campus? If so please analyze the impacts on transportation and circulation in and around the staging area;
- Impacts/damage on City streets due to continuous wear and tear from heavy vehicle and equipment movement and costs for maintenance and restoration during the 30 year construction period and after completion.
- The health impacts on neighbors enduring the constant rumble and vibration caused by heavy vehicles over an extended time period.
- Please analyze the cumulative impacts with other construction and transit projects in the vicinity.

2. **Noise**

Please analyze the following:

- Construction vehicle noise with specific attention to noise from braking or gearing down, or both, that will be required for heavy diesel vehicles exiting the site fully loaded, and travelling down hill. Will there be a prohibition on use of engine brakes?
- Construction noise is among the most troublesome impacts experienced by local residents, with very real health impacts. Please analyze and propose mitigations with respect to limited hours for heavy equipment operation that generates inescapable noise and vibration.
- Impacts on patients, both inpatient and outpatient who are by definition as a whole and individually, "sensitive receptors".
- Impacts on students and researchers for whom concentration and focus is essential.

3. **Air Quality**

As noted in the Initial Study, air quality during construction poses significant potential negative impacts on both the "sensitive receptors" who populate the Medical Center and Medical Office Building in concentrated numbers, and on the immediate neighborhoods. Due to the noteworthy winds primarily from the west and north that will drive through the construction site, the impact of expected pollutants is likely to travel beyond any definable boundaries. However concentrations of particulate matter (PM) may be particularly problematic as the mountain acts as a barrier creating circulating currents and causing PMs to accumulate.

Please analyze each of the following:

- Impact of PM generated by demolition of structures and roadway with attention to volatilized toxic materials from such sources as carpets, glues, varnishes, roadbed, roofing, sewage lines, plumbing, laboratory and medical residue, asbestos removal, concrete dust, etc;
- Diesel emissions from trucks and construction vehicles;
- Release of potentially toxic materials generated by intensive excavation;
- Release of airborne asbestos fibers should serpentine rock be disturbed during deep excavation. Serpentine is commonly found in the Franciscan

Assemblage, frequently mixing in with chert. It is known to contain asbestos and does release harmful fibers when disturbed;

- The release of hazardous particulates into the air should also be analyzed with respect to its **impact on soil and biological resources** in the area. As released PM settles into the mountain, please analyze the potential impacts on wildlife subsisting on local vegetation and on the vegetation itself.
- Impacts on volunteers doing trail work and plant restoration in the forest, tand o hikers and cyclists on the trails
- Any conflicts with City and State policies designed to reduce toxic run-off to the ocean.

4. **Greenhouse Gas Emissions**

The Initial Study acknowledges that construction will generate greenhouse gases that could result in a significant impact. However it fails to address the problem of greenhouse gas emissions generated by the demolition of structures that go to landfill where they continue to produce Green House Gases (methane) over a long period of decay.

Please analyze:

- Long-term generation of greenhouse gas emissions (GHG's) generated by the massive demolitions contemplated in the CPHP.
- Production of cement/concrete is a particularly potent contributor to CO_2. Please analyze the impact on GHG's not only those generated on-site, but also those generated by production of materials used on site, particularly cement.
- Please compare GHG emissions due to new construction with GHG emissions if, instead of demolition some existing buildings were refurbished and remodeled.

5. **Population and Housing**

The Initial Study anticipates producing significant additional pressures on existing housing stock but offers no mitigation. Further the construction of new housing at Aldea presumes displacement of current residents, without an actual plan for relocation. This will inevitably put additional pressure on the entire City but particularly the districts closest to the campus, with respect to affordable housing.

Please analyze:

- The Initial Study omits any reference to housing and impacts on support staff for whom the University does not generally provide shelter. These are the lowest paid, but essential workers who keep any institution functioning and who are needed in large numbers. Have these positions been considered in the population projections? The housing needs of lower paid staff are no-where addressed by UCSF. Please analyze the housing needs for current and future support staff, and the impacts of added pressures on existing housing

stock for these workers and their counterparts who do not work at UCSF but are living in the greater area.

- Please analyze the cumulative impact of UCSF's planned population growth with city-wide projected population growth on housing, transit, Greenhouse Gas Emissions, and local infrastructure including but not limited to water and sewage.

6. **Mandatory Findings of Significance**

Please analyze the cumulative impacts of the CPHP with various private and public projects currently in Planning stages that will compound stresses on transportation and circulation, infrastructure, utilities and service systems, affordable housing needs, greenhouse gas emissions, air quality, noise and Land Use.

This brings me back to my initial concern, that in a 30-year plan UCSF cannot possibly assess cumulative impacts in advance. Even if UCSF has a long-term development vision, intervening projects initiated by others, which are as yet unforeseen will need to be considered by UCSF in conjunction with their own plans and the analysis of cumulative impacts may require changes and/or mitigations that cannot be foreseen at this time. Future EIR's will be necessary.

Lastly, I am also requesting that all studies relied upon in preparation of the Draft Environmental Impact Report be included with its publication.

Thank you in advance for your attention to these concerns.

Sincerely,

Lori Liederman
1227 10th Avenue
San Francisco, CA. 94122

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR Comment - Permeable Interlocking Concrete Pavement
Date:	Thursday, February 20, 2020 9:14:47 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

Please analyze any planned usage of permeable interlocking concrete pavement (PICP) with regard to new pavements in the CPHP. Please include the new 4th Avenue and the new service roads. Please include information on PICP composition with a summary of benefits, limitations, and characteristics. Important considerations, such as hydrologic design, structural design, construction, and maintenance, are also important.

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR Comment - The Performance of New Pavement
Date:	Thursday, February 20, 2020 9:17:15 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

EIR Comment - The Performance of New Pavement

Please identify and quantify the effects of environmental factors and pavement design on the performance of new pavement; establish what the environmental effects are and develop recommendations for mitigating these effects through effective designs, materials selection, and construction; estimate the portion of total pavement damage caused by environmental factors.

Please analyze for both flexible and ridged pavements.

Please include the new 4th Avenue and new service roads.

From: Pam Hofmann
To: Campus Planning - EIR
Subject: EIR Comment - Subsurface Water
Date: Thursday, February 20, 2020 9:19:22 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

EIR Comment - Subsurface Water

Please analyze the adverse effects of subsurface water and how to control it.

Please give the data required for analysis and design. Please use appropriate borings done in wet years.

Include Pavement drainage; Control of groundwater; Construction and maintenance, run-off.

Will ground water need to be treated for contaminants?

There is a constant water flow under Saunders Court, and there are seasonal rivers off of Mt. Sutro in all directions which affect all of the Parnassus campus.

On Koret Way there is an art installation by Peter Nathan Wildvine titled “Elevated Creek” 8July 2000. Although this art work has now deteriorated, it used to carry water from a seasonal spring downhill to a drain.

Ground water needs to be observed by borings made during wet years. For example, borings taken in 2013 are inaccurate because 2013 was the year of the lowest rainfall since 1994. Further 2013 was proceeded by the two next lowest rainfall years, 2011 and 2012. (UCSF Draft management Plan (TAC Draft) Mr. Sutro Open Space Reserve.

Borings taken after years of severe drought cannot accurately show the water seepage of the area.

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR Comment - Usage of Saunders Court for Emergency Vehicles
Date:	Thursday, February 20, 2020 9:21:11 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

EIR Comment - Usage of Saunders Court for Emergency Vehicles

Please analyze the new 4th Avenue and Saunders Court with respect to use as emergency vehicle access roads.

Please analyze whether your anticipated choices for pavement and greening amenities conform to requirements for emergency vehicle access. Will the pavement support heavy fire engines?

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR Comment - Ambulance access
Date:	Thursday, February 20, 2020 9:23:15 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

Please analyze the access to ambulance bays from Medical Center Way vs. access from Parnassus. The AASHTO Green Book states, "A traditional rectilinear street grid provides direct connections and multiple routes and thus has high connectivity." "Emergency service providers have also expressed concern over low-connectivity networks, which may contribute to longer response times and limit the number of routes for emergency access or evacuation."

Please analyze the number of ambulance bays, parking spaces, and the traffic flow for the ER.

Every ambulance bay needs to be designed to get the patient into triage and the EMT personnel back on the street as quickly as possible.

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR Comment - Release of contaminated air
Date:	Thursday, February 20, 2020 9:25:01 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

Please analyze the release of contaminated air, airborne pathogens, and particulates from laboratory and hospital ventilation systems into the surrounding community.

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR Comment - turning encroachment
Date:	Thursday, February 20, 2020 9:26:39 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

Will larger vehicles encroach into other lanes or directions of traffic while making intersection-turning movements? Please analyze this turning encroachment for Parnassus, Medical Center Way, Irving, 4th Avenue, 5th Avenue, Koret Way, and all service roads.

Important elements of turning radii are the wheel paths, which define the needed width of the pavement and the front overhang, which is the zone beyond the pavement edge which must be clear of obstructions above curb heights.

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR Comment - Changes to the CPHP after final plan announcement
Date:	Thursday, February 20, 2020 9:28:23 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

Please analyze possible changes to the CPHP after the final plan is announced.

Please analyze how the CPHP will keep up with changes in the FGI requirements over the many years of construction. Will these changes substantively change the agreed upon CPHP?

The Facility Guidelines Institute is part of the American Society of Health Care Engineering.

From:	Pam Hofmann
To:	Campus Planning - EIR
Subject:	EIR Comment - Ray and Dagmar Dolby Regeneration Medicine Building.
Date:	Thursday, February 20, 2020 9:30:00 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

Please analyze the effects of the proposed new service roads and new construction on the Ray and Dagmar Dolby Regeneration Medicine Building.

The research center is tucked behind UCSF's hospital on a sliver of ground so steep that constructing anything on it seems like impossible folly. "It is a site that essentially doesn't exist," Rafael Viñoly, FAIA, says. The two tall Health Sciences buildings, several loading docks, and utility plants encroach on one side, and a winding road leading through the eucalyptus trees to the top of Mount Sutro edges the other. The location was chosen because it was the last piece of available land on the dense urban campus.

https://www.architectmagazine.com/design/buildings/ray-and-dagmar-dolby-regeneration-medicine-building_o

From: Pam Hofmann
To: Campus Planning - EIR
Subject: EIR Comment - retaining walls and drainage systems
Date: Thursday, February 20, 2020 10:49:11 PM

Dear Ms. Wong,

Thank you for including the following comment in the EIR.

Pam Hofmann

EIR Comment – Retaining walls and drainage systems

Please analyze the retaining walls that will be necessary for the following:

1) the slope in the Proctor/new childcare area;

2) the slope along Koret Way and 4th Avenue;

3) the slopes behind HSIR buildings,

4) the slope at Parnassus and 4th Avenue;

5) the slopes from Irving to Parnassus (north-south) and from 4th Avenue to Hillway (east-west).

Please state the proposed type of retaining wall for each area.

Please include the drainage system chosen to mitigate hydrostatic pressure in each case.

The campus is very steep. The elevation changes hundreds of feet in the short distance from Irving to the Ray and Dagmar Dolby Regeneration Medicine Building.

The CPHP indicates that there will probably be cut and fill for many areas. Note that cut *slopes* are rarely created greater than a *slope* of two to one (horizontal to vertical dimensions). Cut and fill slopes are prone to landslides.

The campus has colluvium rivers and known landslide areas. (See the Haneberg Lidar Study.) These areas will need retaining walls capable of sustaining both the hydrostatic pressures and the force of 400 feet of Mt. Sutro pressing down from above.

The campus is large. Efforts to control hydrostatic pressure will be difficult if not impossible. The top of the campus is the Mt. Sutro Open Space Reserve. Water will enter retaining walls systems through the Reserve. Methods to reduce water pressure through selective drain efforts seems hit or miss, i.e., unreliable.

The ability for a retaining wall to sustain the force from the hydrostatic pressure and the force of Mt. Sutro above will be key to campus reconstruction as put forth in the CPHP.

There is a constant water flow under Saunders Court, and there are seasonal rivers off of Mt. Sutro in all directions which affect all of the Parnassus campus.

On Koret Way there is an art installation by Peter Nathan Wildvine titled “Elevated Creek” 8 July 2000. Although this art work has now deteriorated, it used to carry water from a seasonal spring downhill to a drain.

Ground water needs to be observed by borings made during wet years. For example, borings taken in 2013 are inaccurate because 2013 was the year of the lowest rainfall since 1994. Further 2013 was proceeded by the two next lowest rainfall years, 2011 and 2012. (UCSF Draft management Plan (TAC Draft) Mr. Sutro Open Space Reserve.

Borings taken after years of severe drought cannot accurately show the water seepage of the area.

From: Terry Boyer
To: Campus Planning - EIR
Subject: UCSF Parnassus Expansion
Date: Friday, February 21, 2020 6:56:30 AM

To whom it may concern —

We understand from our neighbors that UCSF is considering expansion plans that will dramatically impact the hill upon which we live, commonly known as Edgewood Avenue, but also encompassing Farnsworth Avenue, Belmont Avenue, and a portion of Parnassus Avenue. While we support the hospital's upgrades and expansion into repurposed areas such as Mission Bay and in-filled into Pacific Heights and the Mission, we are alarmed by what we understand could be a major excavation and intrusion into a green belt area that, once gone, would be a loss of habitat and beauty not only for our neighborhood but for the city. Retaining forested areas creates habitat, reduces noise, mitigates pollution, and lends aesthetic integrity to the varied neighborhoods of this beautiful city. The Parnassus campus enjoys a great legacy as well, integrated into the site it has long occupied, even adding buildings that are light on the land and not intrusive such as the stem cell research facility that we financially supported through the Ayrshire Foundation. But expanding into the East across Medical Center Drive while raising the height limits on the building would feel like an assault on our neighbors. For this environmental review, we ask that the committee reconsider their plans to encroach into the air space and land buffer that has allowed neighbors and families to coexist with one of the great medical research institutions, UCSF.

Thank you for your consideration.

All best,

Terry Boyer
1 Belmont Avenue
San Francisco, CA. 94117
Sent from my iPad

From: Jeanne Blamey
To: Campus Planning - EIR
Subject: EIR on proposed Parnassus campus building plan
Date: Friday, February 21, 2020 3:14:57 PM

To Whom It May Concern,

I am writing on behalf of myself and my husband regarding the impact on our neighborhood of UCSF's proposed building plan. We request that UCSF revise the EIR that it has presented to the residents of Edgewood Avenue and other neighbors who will be impacted by UCSF's building plans.

My husband and I have lived on Edgewood Avenue for 28 years. While we appreciate and support the research, the patient care and the medical expertise of UCSF and its staff, through the years we have also had occasion to experience UCSF as an institution that is not a "good neighbor." The current plans under consideration and the EIR raise serious issues that reinforce this negative perspective once again.

Among the numerous concerns we have are issues of noise, air quality and environmental aesthetics if trees between Medical Center Way and Edgewood are removed and a large building is constructed on the hillside. The project would strain the water and sewer lines in the neighborhood, which, for the most part, are older and not adequate to service such a large number of new users.

Then there are considerations of additional traffic. Please visit Edgewood when UCSF staff arrive for work and see how many of our neighborhood spaces they already take even though they do not have residential parking stickers, or try to drive along Parnassus in front of the Medical Center during work hours and see the chaos that is part of our daily lives. I feel especially sorry for people already dealing with medical issues or sick loved ones having to navigate the stress of Parnassus Street. It can only get worse under your proposed plan.

We also have concerns about housing, construction, and moving people from one part of the UCSF campus to other parts. Each of these areas potentially has a significant and negative impact on the neighborhood, not adequately addressed by the University's EIR.

We support other concerns raised by our neighbors. We request a new EIR that adequately addresses all of our concerns.

Thank you.

Sincerely,

Jeanne Blamey and Robert Fram
114 Edgewood Avenue

From:	Tish Brown
To:	Campus Planning - EIR
Subject:	Need fuller disclosure
Date:	Friday, February 21, 2020 12:13:16 AM

I live at 109 Edgewood Ave and request that before any EIR is resolved we be allowed to see the proposed building adjacent to
our neighborhood in renderings that
reveal the scale, proportions, and 3D location of said development. To what extent are existing houses dwarfed, is the whole neighborhood skewed by too close too large development? Edgewood Ave. is one of San Francisco's most special neighborhoods and shame on UCSF if it is ruined by insensitive site planning.

Letitia Upton Brown
109 Edgewood

Sent from my iPhone

From: Brown, James
To: Campus Planning - EIR
Subject: Dear EIR planning at UCSF,
Date: Friday, February 21, 2020 6:30:29 PM

I am a home owner on Edgewood Avenue. This neighborhood is one of the most pleasant well kept secrets in San Francisco. Now that it knows about the plan, the entire neighborhood feels that the planned building of a 20-story building adjacent to one edge of the neighborhood will vastly diminish the pleasantness of the atmosphere here and the value of our properties. I would urge UCSF to consider building the new hospital in the middle of the available space along Parnassus, leaving smaller outpatient facilities around the periphery. The Edgewood neighborhood will fight the current plan strongly, and there are a lot of heavy hitters that live within it.

From:	Jeff Cole
To:	Campus Planning - EIR
Subject:	Feedback on the NOP of an EIR for proposed expansion at Parnassus campus
Date:	Friday, February 21, 2020 12:48:03 PM

Pursuant to the NOP dated January 14, 2020, and the EIR scoping meeting held at UCSF on February 10, 2010, at which it was announced that the deadline for comments was extended until today, February 21, 2020, I submit these comments focusing on the proposal to construct a new hospital on Parnassus, and issues that the Environmental Impact study and report need to address.

My name is Jeffrey Cole and, with my wife Susan, I live at 277 Edgewood Avenue, San Francisco, in a home we have owned for over 30 years. Our property backs up to UCSF's forest, near the Surge Parking Lot.

Unfairness of the process to date and lack of due process:

At the time the proposed Comprehensive Parnassus Heights Plan was first revealed in the Fall of 2019, it was represented by UCSF that the proposed new hospital would sit West of the existing Medical Center Way. There was no suggestion of any impact on the hillside and forest East of Medical Center Way. That was the case until sometime within the last few weeks, when UCSF began hinting that the footprint of the new building might be expanded Eastward, and might actually cover and encroach into or beyond Medical Center Way. Moreover, it is now hinted that excavation of the forest hillside might be considered. The impact of such possible changes is of enormous significance, particularly to homes at the top of the hillside on Edgewood Avenue. Yet when questioned about these essential details at the scoping meeting on February 20, the UCSF representatives would say only that the "design" of the building had not yet been resolved. It is grossly unfair and premature for UCSF to rush the project into an EIR process before these essential details (footprint and location of the building and adjacent roadways, possible excavation and encroachment on a steep hillside forest) have been revealed. Presumably the experts commissioned to perform the EIR study will be given this information; we your adjacent neighbors should be informed to the same extent and at the same time as the EIR experts. Had that happened as it should, the comments herein would have been expanded. I hereby request that UCSF keep the period for comments on EIR scoping open until a reasonable time after these details have been specified and shared with the community and affected neighbors such as myself.

Subjects to be considered in EIR and related study:

1. All impacts being considered in the environmental impact study must be based on the actual contemplated footprint, boundary, size, height and location of the proposed new hospital, along with any adjacent or contemplated roadways.
2. Impacts on homes on Edgewood Avenue must be specifically considered, including impacts during the extended period of construction. Issues should include noise, light, shade, wind and traffic.
3. Impacts on the forest behind the homes on Edgewood Avenue, and between existing UCSF paved areas and structures and the back yards of Edgewood Avenue homes, must be

considered.

4. Impacts of any changes in roadways (e.g., Medical Center Way) and parking areas (e.g., Surge lot) must be specifically considered.
5. If the hillside forest East of Medical Center Way is to be changed, excavated or impacted at all, then all environmental effects of that must be studied, including all aesthetic effects.
6. Impacts during the extended construction period on the quiet enjoyment of homes on Edgewood Avenue must be specifically considered.
7. Practical effects on the broader Parnassus neighborhood, and Edgewood homes specifically, of building an enormous building within a congested area must be specifically considered. For example, anticipating a constant flow of heavy trucks for removal of demolition material and delivery of building materials, what is planned for when and where they will be staging (waiting their turn to drop off or pick up materials) and moving through the streets? What noise impacts will there be on homes on Edgewood or other nearby streets? How will traffic on Parnassus and other streets be impacted? With other recent construction activity at UCSF as a reference point, knowing the impact of trucks for that project on the neighborhood, how can it be reasonable to subject the neighborhood to a project X times as large? Neighbors are reasonably concerned it would be not just unpleasant but disabling.
8. Assuming the proposed hospital were built as proposed, how would the anticipated vehicular traffic (e.g., for delivery and removal) flow within the UCSF property, and how would it impact the broader neighborhood?
9. What use is contemplated for the Surge Parking Lot, and how will that affect the environment for homes on Edgewood Avenue?
10. The EIR should consider not only scientific and technical variables, but concepts from real property law and tort law such as the right to quiet enjoyment of one's home.
11. I understand that other Edgewood Avenue neighbors are submitting comments, and rather than duplicate them here, I want to go on record as joining in their concerns.

I request that you keep me apprised of any further details that UCSF reveals about the project, or provides to the experts commissioned to perform the environmental impact study and report. I also request to be apprised of any updates or changes in the status of the project, the EIR process, or applicable dates.

Thank you for your consideration.

Jeffrey Cole
277 Edgewood Avenue
San Francisco, CA 94117
jeffcolesf@gmail.com
phone: 415-238-7019

From: Kathleen Conti
To: Campus Planning - EIR
Cc: sarahsmithjones@gmail.com
Subject: UCSF Expansion Plans
Date: Friday, February 21, 2020 4:05:25 PM

To the planning committee:

From an extended list of the problems with the UCSF planned expansion we bring to the attention of the committee that the Edgewood neighborhood is already affected by the high noise levels of the heating, ventilation and air conditioning system (HVAC) serving the hospital and university. Backyards of Edgewood properties facing the parking lot are most affected. The levels of noise affect the activities in these areas and sometimes increase significantly, possibly with maintenance cycles for the plant that seem to be occur preferentially during weekends. We have communicated this problem to the university several times in the past. Before the new plan is implemented a detailed study on the environmental impact should be done to determine how the large increase in volume associated with the new hospital would affect the current HVAC facility and the noise level generated. Will the increase in volume require an enlargement of the current HVAC facility? Will there be a different unit built to service the hospital tower?

In addition to the noise levels there is also concern for the air quality during demolition and construction that will also be a burden to our community, especially those of us with homes backing up on Surge parking lot. And further removal of trees will affect the wind, which is already considerable, at the edge of the hill. There are also geological concerns of excavating the hillside for the construction of the hospital. These need to be addressed in a new study.

UCSF should have to meet California Environmental Quality Act goals with each stage of construction and not create housing, traffic and construction issues that will only perhaps be mitigated by theoretical future solutions.

Finally, we have been unable to view the buildings in elevation against the landscape. There were no renderings showing how a massive 16-20 story building would look as you come west on Parnassus, or how it affects the skyline of the hill. UCSF should institute a new review that enables neighbors to actually see the effects of the proposed buildings on their neighborhoods.

Sincerely,
Marco and Kathleen Conti
211 Edgewood Ave
San Francisco, CA 94117

From:	Nettie Gardner
To:	Campus Planning - EIR
Subject:	UCSF Expansion Plans Concerns/EIR
Date:	Friday, February 21, 2020 2:01:43 PM

To Whom It May Concern:

The expansion plans of UCSF have increased since the last EIR study. Because of this new expansion, it is hard to know what the environmental impact will be.

I live on Edgewood and have not been able to see how the buildings will affect the neighborhood, UCSF needs to be transparent and show the effect of a 16-20 story building.

How will water and sewage lines support the expansion of the hospital and housing?

I have read that there are geological concerns of pulling down the hillside which do not appear on the 2014 report. Shouldn't there be a new study?

The trees of Sutro Forest on Medical Center Way create a buffer for houses on the west side of Edgewood. How will removal of the buffer affect noise and air quality?

In addition, any enormous construction project will impact you neighbors. How will the noise and dust of this massive project affect the neighborhood?

Could this project be studied further?

Thank you.
Nettie Gardner
278 Edgewood Ave
San Francisco, CA

From:	Charles Gardner
To:	Campus Planning - EIR
Subject:	EIR Report, et. al.
Date:	Friday, February 21, 2020 5:33:51 PM

Ladies & Gentlemen:
As a neighbor, I believe it is critical that your EIR report weighs the impact of the inevitable destruction of the forest area, it's well-established ecosystem, its vegetation, and its wildlife. I look forward to a report that measures these considerations in depth. Thank you,
Charles Gardner
278 Edgewood Ave.

Sent from my iPhone

From:	Eleanor Kaplan
To:	Campus Planning - EIR
Subject:	Amended Comments on UCSF Comprehensive Parnassus Heights Plan Initial Study (Study)
Date:	Friday, February 21, 2020 4:46:47 PM

Please disregard the comments I sent to you yesterday and replace them with the following:revision.

It is encouraging to note that two sections in the Study (sections 5.3 on air quality and section 5.9 on hazards and hazardous materials acknowledge that construction and development activities mentioned in the Plan could expose sensitive receptors on the campus site and in adjacent neighborhoods
to substantial pollutant concentrations. Both
these sections state that the CPHP EIR will include an evaluation of the air quality impacts on sensitive receptors. While studies and data gathering are important, we have a right to conclude that they should lead to some action particularly when public health issues are involved.

Another factor of concern is that the Study as part of its guidance
does not include mention of the California Environmental Quality Act (CEQA) that requires that “no projects which could cause significant environmental effects should be approved if there are feasible alternatives or mitigation measures that would lessen these effects.”

In summary, we need more information on why the CEQA requirements, particularly with regard to possible mitigation measures, are not included in the Study particularly when the Study acknowledges that pollution resulting from the demolition and construction activities need to be addressed since, unaddressed, so many people including the most vulnerable namely children and the elderly will be the most affected.

Sent from my

From: Lisa Kessler
To: Campus Planning - EIR
Subject: Environmental Impact Review comments for Parnassus Expansion Project
Date: Friday, February 21, 2020 2:23:38 PM

To Whom it May Concern:

Although UCSF justifies increasing the space ceiling that they agreed to in 1976 and 2014 because of institutional needs, the constraints of the Parnassus Heights site have not changed. If anything, the environmental, traffic, and housing constraints of the area have only worsened in the last several years. The level of intensification of usage that they are proposing for the small site is unreasonable and will severely stress the adjacent neighborhoods, the surrounding woodland reserve, and the city's infrastructure.

This current expansion project, which proposes an increase in square footage from 3.55 million square feet to over 5 million square feet, is dramatically bigger in scale than anything proposed in 2014 and the environment/housing/transportation issues have evolved significantly since then. It is therefore unreasonable to re-use data from an EIR of a different project from 6 years ago. UCSF cannot rely on old data from the prior EIR; they need to prepare a new EIR which accurately reflects the current iteration of the plan and the current situation.

Issues that I would like to see specifically addressed in the new EIR:

Air Quality:

- The air quality impacts on the adjacent Edgewood neighbors of having all the construction vehicles and staging in the surge lot
- Air quality impacts of the demolition of older buildings, analysis of what old/toxic materials (such as asbestos) are in the to-be-demolished structures and how UCSF plans to mitigate that safety issue both for neighbors and for UCSF employees/patients
- How the direction of the wind impacts air quality from ongoing construction projects and chronic exposure of different sides of the campus
- How much are the trees in the strip of Sutro Forest between Medical Center Way and Edgewood contributing to the air quality on Edgewood, and what would be the effect of removing this natural buffer given the expected increase in pollution from years of ongoing construction

Noise:

- Construction noise, especially trucks and vehicles coming and going from proposed surge parking lot behind Edgewood homes in the early morning/late evening
- Noise from hospital generators moving closer to residential areas, especially if any trees are removed
- Noise from Medical Center Way becoming an active street for trucks and facility support vehicles, during construction and in the proposed final plan
- Ambulance noise

Transportation:

- The EIR from 2014 states that 24% of people traveling to Parnassus campus use public transport and 12% use shuttles. With the proposed drastic daily increase in personnel and population served, based on those statistics, approximately 64% of people will be arriving by car and the concomitant increase in parking/traffic needs to be addressed.
- That said, the 2014 numbers do not accurately reflect current transportation demand (especially considering the huge addition of commuters to and from the Mission Bay campus), so they must be reassessed.
- Getting more people to and from Parnassus Heights each day won't just affect the traffic around the Parnassus campus, but also around Mission Bay and on commuter routes from outside the city into SF. As it is bordered by greenspace, UCSF has limited access, much of which is via residential neighborhoods and small local streets; UCSF needs to address the transportation and traffic impacts on neighboring streets and access points including (but not limited to) 19th Ave, Judah/Parnassus, 17th St, Fell St, etc.
- Ride sharing has also become an important factor since 2014 and many local patients/employees/construction workers will take Uber/Lyft in lieu of public transportation or shuttles. This has been a huge problem for other busy places like airports that cannot accommodate the flow of so many additional passenger vehicles. Parnassus Ave and Irving St are already jammed with stopped and waiting Lyfts and Ubers that block traffic and have nowhere to go. How does UCSF plan to address the impact of all the ride share vehicles coming and going and waiting within this limited space?

Housing:

- With the space and personnel increase UCSF is adding significant demand to the city's housing resources, but most of the housing proposals to accommodate the increase in population at Parnassus seem to be planned for years to decades after the initial construction phases. Is this reasonable considering the current housing crunch in SF and the fact that UCSF already fails to meet its existing housing needs/requirements?

Aesthetic:

- Even without having any detailed information about its design, the proposed height and scale of the new hospital building at the eastern edge of the campus makes no architectural sense given the adjacent structures along Parnassus Ave which are almost all 2-story single family homes and multi-unit flats.
- In the Oct 2019 plan, UCSF prepared elevations showing the North-South scale from Irving St up to the Sutro Reserve (page 138), I would like to see similarly detailed elevations drawn that show the massing of the proposed new campus structures looking East-West along Parnassus in both directions, specifically the proposed new hospital building on the Langley Porter site. Drawings should clearly and accurately show the relative size of adjacent structures and properties on Parnassus Ave. I would also like to see before/after plans, aerial models, and elevation drawings of the existing LPPI site compared to the most current iteration of the proposed hospital building (and any planned adjacent structures - patios, plazas, bridges, etc.) with respect to the neighboring Sutro woods and the relationship to adjacent homes on Parnassus and Edgewood Aves.
- UCSF has released no definitive architectural or design information about the new hospital building. Without this information it is impossible to address the aesthetic or

environmental impact of having a massive building (proposed to be taller and larger than any other existing structure on the site) in this EIR.
- As an example of how the aesthetics of such a massive building have not been considered, the "future landscapes" illustration in UCSF's Oct 2019 plan highlighting its "Park-to-Peak" design *doesn't even show the proposed new hospital building* in the context of how the new campus would supposedly be integrated into the surrounding landscape (page 48.)

Greenspace:

- Although the Oct 2019 written plan shows a footprint (page 116) that stays within the existing campus boundaries that UCSF committed to in 1976 and again in 2014, in subsequent meetings an updated plan was presented that dramatically exceeded the original footprint for the new hospital, extending the building across the previously agreed-to campus boundary of Medical Center Way and into the Sutro Reserve space.
- The Agriculture/Forestry section of the EIR proposal was checked off as "does not require study"; seeing as the campus is surrounded by a forest reserve, it is imperative that UCSF look at the land use impacts of the plan
- I feel strongly that UCSF should uphold its promise to the neighborhood to respect existing campus boundaries and not infringe on any part of the Sutro Reserve. This is a valuable asset for both the neighborhood and the environment and UCSF must keep its commitment to preserving this important community greenspace.
- For UCSF to break its commitment to the space cap/campus boundary that it promised sets a dangerous precedent. UCSF should not annex and take over such a limited urban resource as community greenspace for its development/institutional growth and new construction.

UCSF in 2014 had agreed to "cushioning" actions to offset the intensification of use of existing property: https://www.ucsf.edu/sites/default/files/fields/field_insert_file/CAG%20Meeting%20Handout%206.4.14.pdf Instead, the new proposed project further intensifies the use of the Parnassus Heights campus significantly. I would like to know what concrete actions UCSF plans to take to offset this unprecedented demand on the site and increase in usage - specifically addressing housing, traffic, parking, personnel, and construction. Although I agree that UCSF needs to address its aging facilities, meet seismic safety regulations, and build a new modern hospital, the proposed Parnassus plan far exceeds those goals, breaks longstanding commitments to the neighborhood, and in doing so, threatens the future relationship of the University with the community.

Thank you for taking the time to read my comments,

Lisa Kessler

From:	Roger M Low
To:	Campus Planning - EIR
Subject:	Concerns about Parnassus projects
Date:	Friday, February 21, 2020 6:31:14 AM

Dear UCSF,

While I have enjoyed being your neighbor for ten years, I am very concerned about the status of study done thus far. I do not believe there has been sufficient consideration as to impact on:

- Construction being done so close to a hill where there have been mud slides before.
    - Impact on environment of trucks, dust and noise during construction.
    - Sufficient upgrade to water and sewage.
- Long term impact of noise and pollution from such added density of people and activity.
- Impact on transportation and parking in a neighborhood that is already over congested.

I look forward to seeing how you address these questions nad concerns.

Thank You,
Roger M Low
125 Edgewood Ave
SF, CA 94117

From: Mike OCallaghan
To: Campus Planning - EIR
Cc: Sarah Jones
Subject: USCF Expansion
Date: Friday, February 21, 2020 12:34:17 PM

Dear UCSF,

I am writing in response to UCSF's proposed expansion of the Parnassus Campus and draft EIR response. I request UCSF further study the project information I have presented below.

UCSF has generally been a respectful neighbor. I am proud to have the best and the brightest medical professionals work and many live in close proximity to my home.

I have lived in the Cole Valley area for 65 years and at 123 Edgewood Ave for 33 years.

My home is one of the closest homes to the proposed hospital replacement at the corner of Parnassus and Medical Center Way.

I spent many days in the meeting with UCSF prior to the construction of the power plant that is located approximately 600' from my home. After negotiations were completed, UCSF promised Edgewood Ave residents that USCF would never come to them with another expansion. This was due to the immense scope and capacity of the Mission Bay project that was commencing. This promise to the community must be kept.

UCSF claims it has reached out to neighborhood groups and held meetings with the effected groups for many months. This is not entirely accurate. The Edgewood Ave Neighborhood Association, arguably the most impacted by this expansion, was not apprised or invited to these meetings up until recent weeks. This process cannot continue absent Edgewood Ave Neighborhood Association at the table. I do not feel adequately prepare to make this reply to the EIR as I have not been allowed to attend all the prior community meetings due to lack of notice. The project explanations that I have been presented have not been well prepared, are confusing and inconsistent. There is not enough accurate information currently available to properly respond. The short EIR response period of several weeks is not adequate. As the Edgewood Ave Neighborhood Association was not notified of the meetings until several weeks ago, the EIR response period should have been extended for several months, not one week.

The current project is ill conceived and should be substantially modified and resubmitted to the community for consideration.

My primary concern is the construction of this hospital at the very edge of the campus. The plan calls for a 296 foot tall building bordering on Medical Center Way. This is an unacceptable location for such a building as it violates the intent of the 2014 UCSF neighborhood agreement, Appendix D OP3 Cushioning. It also violates a basic premise of urban planing by placing a large non residential building in close proximity to a 2 and 3 story residential neighborhood. There must be a larger buffer boundary than proposed. A building of this height and mass must be located closer to the center of the campus and not at the very edge adjacent to and impacting residential area. The edges of the campus must be lower and terrace back into the taller buildings of the campus. Additionally, a tall building at the edge of the campus may pave the way for future construction of even greater height adjacent to this new hospital the during a subsequent UCSF expansion.

UCSF has not shared visual perspectives from Edgewood Ave or from any other neighborhood locations of the proposed project. Perspectives must be provided and viewshed, light and air studies conducted showing the proposed massive 20 story building at the very edge of the campus. UCSF must institute a new review that enables neighbors to actually see the effects of the proposed buildings on their neighborhoods and homes. If this proposed hospital were to be allowed in the proposed location, my home and many others on Edgewood Ave, would have the sun blocked out in the afternoons.

In addition, there are many issues that I am concern about for the proposed new hospital and the project as a whole

that I will list and explain:

Air Quality:
The prevailing wind patterns for approximately 8 months a year are westerly. My home is to the east of the campus and directly down wind. If this building were allowed to be built, the construction and foundation work will introduce large amounts of dirt and debris into the air. Due to the unusually high wind velocities experienced on campus in the summer months, it will be very difficult to mitigate this problem when building a building so close to the edge of the campus. My home and others down wind may well become unlivable during construction.
I am concerned about the impacts of the demolition of the Langley Porter building, asbestos must surely be present in that building and due to the high wind velocities mitigation will be very difficult.
The trees in the strip of Sutro Forest between Medical Center Way and Edgewood Ave offer a buffer to the existing campus. The location and close proximity of the new hospital will put many of the homes on Edgewood Ave directly downwind and in the path of the air from the hospital ventilation exhaust and cooling tower plume. The air quality on Edgewood Ave would be effected.
Noise:
If the hospital were to be constructed as per the current proposal, the close proximity of my home to construction site would render my home un-occupiable during portions of the construction due to the construction noise:
The daily coming and going of construction vehicles from Medical Center Way.

The Surge Parking Lot becoming staging ground for construction vehicles. This parking lot is in close
The project includes the emergency entrance to utilize Medical Center Way. This will introduce ambulance noise day and night closer to our homes.

The vibrations from the close proximity of the construction to my home are a real concern. My home was built in 1905 and will not tolerate the heavy vibrations of close by construction.

Transportation:

The additional 7,000 person daily increase to the campus on increase in personal vehicle or UCSF shuttle busses use due to this new project should be allowed.

No more car traffic can be accommodated in the neighborhood. Parking is fully impacted week days during the academic year by UCSF students, patients and employees using the campus. Cars are constantly roaming Edgewood Ave during the day looking for parking instead of using campus garages. More parking spaces on campus is not the answer as the street congestion is already dangerously high and not more vehicles may be brought into the neighborhood.

Housing:
This proposed expansion cannot be allowed absent providing more housing. The amount of additional housing in the current proposal is not adequate for the additional number of daily people projected to be in the campus. To accommodate this, UCSF should place housing along Medical Center Way at Parnassus rather than the proposed hospital.

Sincerely,
.
Michael O'Callaghan

mocallaghan123@me.com
415-238-2114
123 Edgewood Ave

From:	Maryann Rainey
To:	Campus Planning - EIR
Subject:	The Environmental Impact Report (EIR) scoping meeting on February 10, for UCSF"s proposed Comprehensive Parnassus Heights Plan (CPHP)". Comments focus on building for student/staff housing in the coming twenty to thirty years.
Date:	Friday, February 21, 2020 3:56:44 PM

February 21, 2020

Diane Wong,
UCSF Campus Planning, Box 0286,
San Francisco, CA 94143
EIR@planning.UCSF.edu

Dear Diane Wong,

Regarding "The Environmental Impact Report (EIR) scoping meeting on February 10, for UCSF's proposed Comprehensive Parnassus Heights Plan (CPHP)". Comments focus on building for student/staff housing in the coming twenty to thirty years.

Thank you for the opportunity to respond to the documents presented at the Environmental Impact Report (EIR) scoping meeting on February 10, for UCSF's proposed Comprehensive Parnassus Heights Plan (CPHP). Thank you for extending the date for "input on environmental topics to be studied further" to today, February 21, from February 14.

It is with great pride that I am associated with UCSF and it is my fondest hope that UCSF is successful as an institution of learning, of health care delivery, as a steward of land and as a member of the neighboring community.

It is clear that UCSF wants to make thirty year plans for the development of the Parnassus Heights campus, prioritizing research, teaching, patient health care, student life and housing needs while being a good neighbor.

Now the lack of available housing for students and staff is constricting the ability of UCSF to function optimally. Times have changed.

My standing to give pertinent comment on the Scoping EIR is based on these characteristics:

> As a person who has lived on Fourth Avenue between Parnassus and Irving, north of the proposed extension of Fourth Avenue through the current dental school. I have had the good pleasure to live in this home for over thirty years and to have lived in the greater neighborhood for forty-five years.
>
> As a person who provides rental housing to UCSF students who reside in a flat over my home on Fourth Avenue
>
> As a member of the Advisory Board of the Sutro Stewards and a person who works in the Sutro Stewards Nursery as a volunteer
>
> As a prior staff nurse for ten years in Moffitt Hospital and as an alum of the UCSF School of Nursing Graduate school, graduating with a Master of Science in Nursing, practicing as an advanced practice nurse for decades.

On February 10, I attended the meeting where UCSF presented the initial study of the environmental

impact and UCSF's plan to re-envision the historic Parnassus Heights campus. I found that studying the maps and information presented was very informative and provided food for thought. I am familiar with both the current Aldea Housing and with the area called "Fourth Avenue Extension" in the Scoping EIR presentation.

(I am not so familiar with the prior long-term planning agreements have been made. I know that student housing was provided in the Mulberry Towers within the past decades, but not now. Now that housing in the City has become tight, UCSF might consider returning these towers to provide student housing. Also related to housing, I had understood that the renovations of buildings on Parnassus Avenue were intended to provide housing, and now I find that is no longer the case.)

I propose that it is important to provide housing for students/staff now. As a person with standing, I respond to the Scoping EIR with the following statement.

A detailed assessment of the environmental impact is needed to assess the relative benefits of building student/staff housing at the Fourth Avenue Extension location and to assess the relative benefits of building housing at the Aldea location. This assessment needs to address the questions; should the timeline and details of building student/staff housing be reordered? Should the housing on the Fourth Avenue Extension be build first, before Aldea housing?

It is important to develop student housing in an area that is rich with amenities that are necessary for student/staff life. I propose <u>re</u>ordering the planned of the development of buildings discussed in the Comprehensive Parnassus Heights Plan / scoping EIR such that student/staff housing is built now on the "Fourth Avenue Extension", and the building of Aldea student/staff housing in an area that is far away from neighborhood amenities be delayed. It is reasonable to build student/staff housing without parking for cars on the Fourth Avenue Extension because the location is close to restaurants, to transit, to the groceries. The Fourth Avenue Extension is located where it is reasonable to not provide for cars and parking. It is likely to prove <u>un</u>reasonable to build student/staff housing on the Aldea site where shuttle service ceases on weekends and during the wee hours; where MUNI transit does not have a nearby, dedicated stop; and where there is not the richness of community amenities that exist in within walking distance of the Fourth Avenue Extension location. Principles of long-term visioning that outline organizing concepts and smart urban planning principles for reshaping the campus over the next several decades will guide final decision making.

It is my expectation that an assessment will show that there are potential issues with the Environmental Impact Report (EIR) scoping for UCSF's proposed Comprehensive Parnassus Heights Plan (CPHP) as presented, related to student/staff housing. It is my expectation that smart urban planning principles will show that there will be many more benefits enjoyed if the Scoping EIR timeline is altered such that UCSF student/staff housing on the Fourth Avenue Extension is built now and that Aldea Housing is delayed.

Thank you for your time and attention.

Sincerely,

Maryann Rainey

1318 4th Ave
San Francisco, CA 94122
(415) 225-7814

From: GRETCHEN SANDLER
To: Campus Planning - EIR
Subject: UCSF EIR for Parnassus build out
Date: Friday, February 21, 2020 4:40:29 PM

To Whom it May Concern,

As a long time Edgewood resident, I have concerns about the proposed new buildings on the Parnassus campus. From what I understand, it is the intention of the UCSF to add 1.5 million square feet to this primarily residential neighborhood. This seems quite extreme for a neighborhood that has many single family homes and small apartments as well as small businesses. This 42% jump in size blows past the agreement reached with the Regents to maintain the square footage at 3.55 million square feet, utterly reshaping the campus and neighborhood.

These are concerns that I have for the proposed building.

Location:
Locating the hospital, the largest and tallest of the new buildings on the outer most corner of the campus seems incredibly invasive to the neighbors. Currently the largest buildings are near the center, with a gradual lessening in height as the campus moves outward. This design helps integrate the campus, whereas the proposed building is a shock to the neighborhood.

Air Quality:

- What will the air quality impacts of the demolition projects be specifically?
- What old materials (like asbestos) are in the old construction and how do you plan to address that in regards to many residents in the area?
- What will the air quality impacts be on the adjacent Edgewood neighbors of having all the construction vehicles in the Surge Lot, coming and going? My house directly abuts the Surge Lot, so this is a big concern for me.
- How much are the trees in the strip of Sutro Forest between Medical Center Way and Edgewood affecting the air quality on Edgewood and what would be the effect of removing this buffer?

Housing:
Every other project in the city is required to pay attention to housing before they build. How will UCSF address this? How will UCSF add this much square footage and put a big demand on existing resources without first addressing housing issues.

Traffic/Transportation:

- Currently, traffic impacts our neighborhood as visitors and employees drive

around our neighborhood streets looking for parking. What will UCSF do about the increased traffic to the new Parnassus Campus?

- Is it really sufficient to say that public transportation will fix this when we know that San Francisco's public transportation is quite poor and needs a massive reconfiguration. There is no guarantee that this will happen any time soon if at all.
- In the previous EIR, you say that 24% of people traveling to Parnassus campus use public transport and 12% use shuttles. So if you are going to increase the personnel and population of people served so drastically, what will you do to mitigate this with an anticipation that around 64% of all those people will be arriving by car?
- More people won't just affect the traffic around Parnassus, but also around Mission Bay and people commuting from outside the city into SF. It is not just a neighborhood issue, but a citywide issue.

Noise:

- We know that construction makes a lot of noise. How will the project mitigate that for us neighbors who directly abut the Surge lot, not to mention all of Edgewood/Farnsworth.
- We already get plenty of noise from hospital generators at weird hours and once they move closer to our homes, then what?
- What about the increased noise from Medical Center Way becoming an active street for trucks and facility support vehicles?

Surge Parking Lot:
Many of our homes abut the Surge parking lot. There are concerns that this lot will become a staging area for construction. This would be quite disturbing. On a personal note, my children's bedroom windows overlook this lot.

Stability of the hillside:
Many of us are concerned about the proximity of the proposed hospital to the hillside that our homes rest upon. Has there been a study of how such a large project next to, and perhaps even encroaching upon the hillside will have on its stability. Will the vibrations of this work travel under and into our homes?

Proposed Building Elevations:
Finally, we have not been able to see the elevations of the buildings. There are no renderings showing how a massive 16-20 story building would look as you come west on Parnassus, or how it affects the skyline of the hill. UCSF should institute a new review that enables neighbors to actually see the effects of the proposed buildings on their neighborhoods.

I understand there is a need to upgrade some of the buildings on campus, but

upgrades should not be seen as an opportunity to reshape the neighborhood by greatly increasing the size of the campus. We would appreciate more communication and more listening to what it is like to be neighbors with UCSF. This is not just a NIMBY issue. I love having the hospital so close as I am a UCSF patient, but the way in which UCSF is working or more like not working with one of their closest neighbors, is appalling. As mentioned above, there already exists an agreement with the Regents on the size of the Parnassus campus. This proposal undoes an agreement made in good faith and will create a great deal of tension with the surrounding neighbors. We are willing to workwith the University to end up with a plan that both enhances the campus and maintains the neighborhood as a safe, livable place to raise families.

Sincerely,
Gretchen Sandler

From:	Sandler, Jim
To:	Campus Planning - EIR
Subject:	UCSF EIR for Parnassus build out
Date:	Friday, February 21, 2020 2:45:27 PM

To whom it may concern,

As an Edgewood neighbor I have grave concerns about the proposed build out of the Parnassus campus. From what I understand, it is the intention of the University to add 1.5 million square feet to this primarily residential neighborhood. That is equivalent to adding 3 Tranamerica buildings, a massive footprint no matter where it is located, let alone adjacent to single family homes and small apartments. This 42% jump in size blows past the agreement reached with the Regents to maintain the square footage at 3.55 million square feet, utterly reshaping the campus and neighborhood.

Below I list other issues of concern:

1) Location of the new hospital - Locating the hospital, the largest and tallest of the new buildings on the outer most corner of the campus seems incredibly invasive to the neighbors. Currently the largest buildings are near the center, with a gradual lessening in height as the campus moves outward. This design helps integrate the campus, whereas the proposed building is a shock to the neighborhood.

2). Traffic - The increase in size of the campus begs the question about traffic impacts to the neighborhood. We already have large numbers of people driving around our streets looking for parking. It is easy to imagine the increased traffic of having a much larger campus, let alone the construction vehicles needed for such an undertaking. It is easy to just say that public transportation will fix this, but San Francisco's public transportation is quite poor and needs a massive reconfiguration. There is no guarantee that this will happen any time soon if at all.

3). Noise - There is great concern about the noise level produced for such a large undertaking, especially for the hospital building at the edge of our neighborhood. Will the construction be taking place only during "normal" work times. Loud noises already travel up to our neighborhood from the campus during odd hours. We already know what the noise is like when a neighbor is remodeling their home. I can only imagine the noise produced from this scale of a project.

4). Air Quality - Again, there are concerns about the dust and other pollution created by construction and construction equipment. Although our neighborhood is up the hill, we are downwind of the campus. Air flows from the campus right into our yards and homes.

5). Surge Parking Lot - Many of our homes abut the Surge parking lot. There are concerns that this lot will become a staging area for construction. This would be quite disturbing. On a personal note, my children's bedroom windows overlook this lot.

6). Stability of the hillside - Many of us are concerned about the proximity of the proposed hospital to the hillside that our homes rest upon. Has there been a study of how such a large project next to, and perhaps even encroaching upon the hillside will have on its stability. Will the vibrations of this work travel under and into our homes?

7). Water and sewage - What are the impacts on the water and sewage infrastructure of the neighborhood of this project?

8). Finally, we have not been able to see the elevations of the buildings. There are no renderings showing how a massive 16-20 story building would look as you came west on Parnassus, or how it affects the skyline of the hill. UCSF should institute a new review that enables neighbors to actually see the effects of the proposed buildings on their neighborhoods.

I will stop here as I am sure many of my neighbors have brought up other issues of concern. We understand there is a need to upgrade some of the buildings on campus, but upgrades should not be seen as an opportunity to reshape

the neighborhood by greatly increasing the size of the campus. As mentioned above, there already exists an agreement with the Regents on the size of the Parnassus campus. This proposal undoes an agreement made in good faith and will create a great deal of tension with the surrounding neighbors. We are willing to work with the University to end up with a plan that both enhances the campus and maintains the neighborhood as a safe, livable place to raise families.

With regards,

James Sandler

From:	Barbara Smith
To:	Campus Planning - EIR
Subject:	Comments on Notice of Preparation of EIR and Initial Study
Date:	Friday, February 21, 2020 5:12:10 PM

TO: Diane Wong, Environmental Coordinator, UCSF Campus Planning

CC: Francesca Vega, Vice Chancellor, Community and Government Relations, UCSF Staff, and Members of the Community Advisory Committee

FROM: Barbara Smith, Inner Sunset Resident
1473 6th Avenue, SF 94122

IN RE: Comments on Notice of Preparation of Environmental Impact Report and Initial Study Notice of a Public Scoping Meeting regarding the UCSF Comprehensive Parnassus Heights Plan

DATE: February 21, 2020

Background

My husband and I have been residents of the Inner Sunset for 48 years and neighbors on 6th Avenue between Kirkham and Judah for 34 years. We love the neighborhood and our neighbors. We also appreciate the importance of UCSF as a world-renowned institution and asset to the neighborhood and San Francisco. We recognize the need for modernizing, replacing and adding to the facilities. At the same time, since any changes to the campus will impact the surrounding neighborhood, they must be carefully planned and evaluated with meaningful community input based on clear, transparent and detailed information.

Comments

Even as a "scoping" report, I found it to be much too conceptual and the presentation of proposed changes fails to provide clear comparisons to previous plans and agreements. Without additional detail it is impossible to assess even preliminary impacts. I urge you to revise and reissue the Initial Study and at a minimum include the following to provide a clearer picture of the proposed changes for the community to review:

Provide detailed maps clearly indicating the changes between the existing, previously approved and proposed site plan, including building footprints, open space, parking and traffic flows within and around the site.

Provide tables to compare by use, the current gross square footage with previously approved and proposed gross square footages and clearly indicate the changes.

Provide tables with historic housing units/square footages on the campus and compare these numbers with current, previously approved and proposed housing units/square footages. Some of the overall gross square footage numbers include housing and others do not making it very difficult to assess the proposed changes.

Tables should be included to show the student, staff and patient populations will increase.

Where buildings are proposed with a wide range of heights, clarify where the additional height would be built. The West Side Housing structures are proposed for six to ten stories – up to 120 feet. A 120-foot façade along Kirkham at 5th would overwhelm the existing residential structures already impacted by the UCSF campus.

How will a hotel replacing the Lucia Child Care center impact the adjacent residential housing and traffic flow along Parnassus?

Traffic and parking changes should be clearly presented.

Provide a detailed schedule for the EIR report preparation and review process.

Again, I urge you to revise the Initial Study and incorporate into it these requested changes. Without providing additional information at this stage of the process, it will not be possible for the community to provide meaningful input and support for the proposed UCSF improvements.

From: Lisa Sporri
To: Campus Planning - EIR
Subject: UCSF EIR Comments
Date: Friday, February 21, 2020 10:42:45 PM

To Whom It May Concern,

I am writing in response to the Notice of Preparation of an Environmental Impact Report for the UCSF Comprehensive Parnassus Heights Plan.

The current new plan has been recently altered to include the opportunity site as crossing Medical Center Way and included opportunity site that extends up the hill (East of Medical Way) and next to the Edgewood Neighborhood.

As indicated in UCSF reports, … "Although parameters for the New Hospital project (location, size, projected population) are accounted for in the CPHP and will be analyzed at a program level in the draft EIR, the new hospital represents a major project for UCSF and many details of the New Hospital are still being developed. Therefore, the New Hospital will be the subject of a subsequent project-specific environmental review separately from the CPHP when more details become available." page 3

However, per your new report, the location was recently altered to cross Medical Center Way.

As described…"If the CPHP is approved by the Regents and the 2014 LRDP is amended, the CPHP would become the primary planning document for Parnassus Heights and would be used by UCSF to guide the development of the campus site through the next 30 years, or an approximate horizon year of 2050. " page 5

If, as you stated that the new hospital represents a major project and is likely the main portion of the new development, it does not make sense to approve a plan without the details of the New Hospital, specially crossing Medical Center Way. As indicated by UCSF, this will be the primary planning document and a major portion of the project. The current EIR does fully assess the New Hospital as the details are not available with a significant one that it crosses Medical Center Way onto a new hillside.

The new EIR should study with the details of the New Hospital, specifically studying the impact of crossing over Medical Center Way as is substantially changes impact on many levels including:

<!--[if !supportLists]--**>1) <!--[endif]-->Footprint of UCSF at it currently stands and changes the Edgewood neighborhood. Previous agreements indicated that UCSF would work to keep the feel of Edgewood neighborhood. By crossing Medical Center Way, significantly alters neighborhood. By crossing Medical Way, it will significant impact the neighborhood that residents from surrounding areas access and enjoy for recreation. Please study how the area will be impacted as a local sanctuary, dog walking area, and place children play.**

<!--[if !supportLists]--**>2) <!--[endif]-->Please study illumination at night. Multiple houses may be impacted by the lighting. Currently the distance (not crossing Medical Way) creates a buffer for both illumination at night and noise.**

<!--[if !supportLists]--**>3) <!--[endif]-->Please study the impact of shade from the building onto the neighborhood, especially Edgewood and Farnsworth.**

<!--[if !supportLists]--**>4) <!--[endif]-->Farnsworth steps is a community area in which many people access, study the lighting changes especially in the afternoon when people walk dogs, families play and take walks. Mt. Sutro is a recreation site that is used by the surrounding community.**

<!--[if !supportLists]--**>5) <!--[endif]-->If the hospital crosses over Medical Way, it will impact an entire new hill. The previous EIR did not study the new location extension of the opportunity site. Please study the geological effects on the Edgewood/Farnsworth Hill, including vibrations from construction, and impact of changing hill side. There are multiple houses on Farnsworth and Parnassus that may be impacted by geological shifts due to construction.**

Lastly, The city of San Francisco with its 7 x 7 footprint has a finite amount of green space for the rest of time, it is just not practical in a congested urban environment to cultivate new green lands and this problem only exacerbates with time. And therefore incomprehensible that an advance city such as ours would even consider chopping down trees and encroaching on our green spaces to build anything.

Development should adhere to clear guidelines that all new buildings should stay within the current footprint. Furthermore UCSF should put safe guards in place so such ridiculous plans can nevermore be entertained.

Green spaces are the endangered species in an urban environment, such a plan is none less ridiculous than one to build an airport in GG Park. Detroit should be an object lesson in building anything, no building however noble it's intentions can be a substitute for green spaces full stop.

Thanks you forth these considerations,
Lisa Sporri

TO: Diane Wong, Environmental Coordinator, UCSF Campus Planning

CC: Francesca Vega, Vice Chancellor, Community and Government Relations,
Brian Newman, Senior Associate Vice Chancellor, Real Estate,
UCSF Staff, and Members of the Community Advisory Committee

FROM: Maria Wabl and Susan Maerki. Members of the Future of UCSF Parnassus Heights Advisory Committee

IN RE: Comments on Notice of Preparation of Environmental Impact Report and Initial Study Notice of a Public Scoping Meeting regarding the UCSF Comprehensive Parnassus Heights Plan

DATE: Revised February 20, 2020

VIA EMAIL: EIR@planning.ucsf.edu

Background

As two members of the Community Advisory Committee, we met to discuss the Notice of Preparation (NOP) of the Environmental Impact Report (EIR) for the proposed UCSF Comprehensive Parnassus Heights Plan (CPHP) issued January 14, 2020. The CPHP is the university's plan to meet projected space needs for research, patient care and education over the period 2020 to 2050.

The comments, questions, and requests represent observations by one or both of us. This has been supplemented by additional discussion that incorporates comments offered by members of the community at the public scoping meeting held Monday. February 10, 2020.

General Comments

While we recognize that it is impossible to provide details and precise estimates over a 30-year planning period, the CPHP EIR must incorporate more detailed information, broaden the discussion of environmental effects, and increase community commitments and touchpoints beyond those that are included in the draft scoping document.

1. **We request that UCSF extend the CPHP EIR development and approval process period.**
   - Although the UCSF community, in conjunction with community working groups and the current Advisory Committee have been discussing the proposed CPHP for nearly two years, the university is not allowing time for sufficient community input and review.
     - The CPHP proposes 2.9m gsf of new construction and nearly 2.0m gsf net increase over the current footprint. The current footprint already exceeds the "space ceiling" limitation in the UC Regents resolution.
     - The current schedule proposes review and approval at the Board of Regents meeting in November 2020. This should be moved out to the January or March 2021 meetings to allow for more extended community review of the Draft and Final CPHP EIR that will be prepared.

2. **Relationship of CPHP to 2014 LRDP must be clarified and be made more specific.**
   - In general, there is a sense that UCSF has not made a compelling case for all components of the CPHP and the proposed space increases. As a first step, it is necessary to clarify how the estimated increased space is allocated across areas and functions.
   - Incorporate tables that compare statistics and estimates in the 2014 LRDP to similar statistics and estimates for the CPHP, as well as incorporate best current condition estimates. The document is written primarily as a "stand-alone", with numbers and statistics embedded within the text and limited reference to comparable numbers presented in the 2014 LRDP or to current conditions on the campus.
     - For example, the 2014 LRDP proposed a new hospital with approximately 308,000 gsf and less than 200 beds. The CPHP increases this to 955,000 gsf and 384 beds. This also needs to be discussed in conjunction with the maintenance, renovation, and any new uses proposed for Moffitt hospital.
     - Comparisons need to be presented for building height and square footage, population, transportation, housing, and other sections of the CPHP EIR. Tables need to be clearly annotated to indicate how/if the proposed additional housing and that resident population is included/excluded.
     - A separate table is needed to clarify how the approximately 2.9m gsf of new building development, with a net increase of approximately 2.0m gsf to 6.0 m gsf after incorporating other approved development and planned demolition, is allocated across the functional districts. That is, how much of the increase is for the new hospital and clinical east end, the academic and research buildings, housing and other?
   - Enhance maps to clarify overlay of existing and proposed buildings and footprints.

3. **CPHP Environmental Impact Report must include a UCSF commitment to more project specific scoping over the time period.**
   - The draft proposes project level analysis for the projects in the Initial Phase – Irving Street entrance, RAB, and Aldea – but only commits to "determine the appropriate level of additional review, *if any (emphasis added*), needed" for additional projects.
   - The new hospital is the only project that the draft scoping document identifies for a project specific EIR. At minimum, the proposal for proposed housing on the Fourth Avenue extension appears to warrant a project specific EIR.
   - We request a UCSF commitment to additional project specific review that will provide touchpoints to reassess changes to "baseline" conditions over the timeframe and permit identification of cumulative effects.

4. **CPHP impact timeline must be clarified to quantify the expected "front loading" of impacts.**
   - It appears that a large proportion of the population and transportation growth is expected within the Initial phase. This is obscured by presenting the current or 2020

estimates and then a 2050 number. At minimum, the EIR should present both Initial Phase (2030 or to 2035, the end of the 2014 LRDP) and 2050 estimates for the CPHP.

- Include timeline of proposed demolitions and replacement buildings. This should include discussion of changes relative to the 2014 LRDP.
    - For example, the 2014 LRDP proposed demolition of Woods and Surge in the 2014-2019 timeframe and demolition of Proctor and Langley Porter in the 2020-2024 timeframe. Obviously, the Surge and Woods buildings are still standing. How will the demolition and construction timelines differ?
- Incorporate timeline of expected concurrent renovations/upgrades to buildings included in the 2014 LRDP but not addressed in CPHP.
    - For example, the 2014 LRDP proposed renovation of the Faculty Alumni House and Moffitt Hospital, as well as smaller projects (medical gas storage tanks, retaining wall) by 2035. Where will these occur in the CHCP timeline?

Specific Comments and Questions

This section follows the Table of Contents for the UCSF CPHP Initial Study and references questions and comments on sections.

2. Project Description

2.2 Campus Site Location and Existing Site Characteristics

- Confirm that average daily population includes estimate of contract service staff (e.g., custodial workers) that are regularly on campus and temporary contractors, such as construction workers. Confirm that visitors are a broad definition that includes patient families, consultants, delivery, and community use of UCSF facilities. Add such estimates if these populations are not included in your measure of average daily population.

2.3 Relationship of CPHP to 2014 LRDP

- Specifically identify and reference the UCSF campus sites addressed by the 2014 that would continue to have an approximate horizon year of 2035.

2.4 CPHP

Initial Phase

- See general comments on project specific review.
- Identify and reference the UCSF campus sites addressed by the 2014 LRDP that would continue to have an approximate time horizon of 2035.
- Opportunity Sites
    - This is the first time it is clear that UCSF wants both a tunnel and a bridge across Parnassus
    - Provide a map and more details to indicate how the service and utility corridor is proposed to connect from Medical Center Way to Koret Way and Fourth Ave. (mid-block on Fourth or onto Kirkham?). Is this envisioned as a one-way or two-way street?
    - It appears that the first phase of Aldea Housing Densification will result in substantially less housing than was envisioned in the 2014 LRDP in a comparable

timeframe. The Initial Phase proposes an increase of about 140 units at Aldea. The 2014 LRDP, with UC Hall, Millberry Towers and Proctor/5th Avenue would have added over 300 units by 2035. What can be done to accelerate some of the housing projects? (Reconsider Millberry Tower for housing?)

2.5 Revisions to the 2014 LRDP

- See general comments on tables and maps to compare 2014 LRDP and CPHP statistics and estimates.
- Confirm that updated population estimates and average daily census include a broad definition of staff (e.g., outside contract employees) and of visitors (construction, delivery. Provide breakdown of estimate for 2020-2030 and 2030 to 2050.

5. Evaluation of Environmental Effects - General Comments

- Provide list of projects approved in 2014 LRDP that are excluded from CPHP. (p 15)
- Construction effects must be addresses more broadly. It is not limited to Air Quality, but must be included in population and traffic estimates and the noise impacts. Include more detail regarding construction impacts, parking and staging.

5.1 Aesthetics

- In addition to the proposed evaluation of building location and massing, nighttime illumination, and shadows:
    - Commit to comprehensive shadow analysis of areas on all the edges of the campus, and impacts to sunlight/shadows both over annual and daily periods.
    - The shadow study must include impacts to campus areas that currently exist, such as Saunders Court, Parnassus Avenue, and both the Kirkham and Lucia Child Care Centers and their play yards, and Fifth Avenue housing, both during and after the proposed CPHP construction.
    - The shadow study must include impacts to recreational areas that currently exist, such as schoolyards, Kezar Triangle, and Golden Gate Park, both during and after the proposed CPHP construction.
    - Commit to street level wind analysis that includes the planned Saunders Court promenade, all proposed outside decks (Millberry Terrace, new hospital, other), and the extension of Fourth Avenue
    - For public safety and aesthetic reasons, all new development, including, but not exclusive to Aldea and West end housing, commit to undergrounding utilities and, in the case of the West end, be compatible with street lights installed as part of the Inner Sunset Utility Undergrounding District.

5.2 Agriculture and Forestry

- Provide additional detail on incursion and proposed replacement of Sutro Forest area expected to be impacted by new hospital construction.
- Comment on commitment to implement Mount Sutro Open Space Plan in conjunction with activities associated with the CPHP and/or anticipated impacts and changes.
- Comment on expected impact of new Academic Research Building and demolition of Dental School building on redwood grove along Parnassus and adjacent to the Faculty Alumni House.

5.3 Air Quality

- In addition to air quality concerns associated with the construction period, include evaluation of estimated air quality changes associated with the expected increase in building size and energy use, campus population, housing, and car/shuttle traffic.
- The CPHP EIRB NOP does not mention building material or naturally occurring asbestos that is likely to be encountered during demolition and excavation activities. This should

be studied and mitigation measures should be identified in the EIR to protect employees, residents, patients, children, and the construction workers.
- Describe expected mitigation measures to reduce/contain construction traffic and debris that affect air quality.
- Describe expected mitigation measures to reduce/contain changes associated with the expected increase in building size and energy use, campus population, housing, and car/shuttle traffic that affect air quality.

5.6 Energy
- In addition to energy concerns associated with the construction period, include evaluation of estimated energy use associated with the expected increase in building size and energy use, campus population, housing, and car/shuttle traffic.
- Provide additional detail on UC sustainability practices that are expected to be implemented/incorporated into building and streetscape design.

5.7 Geology and Soils
- Numerous neighbors have raised concerns about wildfire, landslide, water drainage, and earthquake activity. The CPHP plan proposes to evaluate these risks, as well as the additional risks that may arise due to construction and the ongoing operation of the proposed buildings.
- This evaluation should include potential impacts on the surrounding neighborhood and not be limited to the UCSF campus.

5.8 Greenhouse Gas Emissions
5.9 Hazards and Hazardous Materials
5.10 Hydrology and Water Quality
- Comments are similar to those related to air quality and energy. In addition to emissions and hazardous materials concerns associated with the construction period, include evaluation of estimated changes associated with the expected increase in building size and energy use, campus population, housing, and car/shuttle traffic.
- Describe expected mitigation measures to reduce/contain construction traffic and debris that affect emissions, hazardous materials, and water quality.
- Note: 5.10 Hydrology: item e – both boxes checked

5.11 Land Use and Planning
Although no development outside of the established campus boundary is proposed, new buildings, such as the Long Hospital Replacement, will exceed height and density of current buildings on the campus. The proposed West Side housing, at six to eight stories, significantly exceeds the neighboring R-2 residential 40-foot height limit.
- Comparisons of the CPHP estimates to current buildings need to be presented for building height, footprint and square footage. Tables need to be clearly annotated to indicate how/if the proposed additional housing is included/excluded.

- Enhance maps to clarify overlay of existing and proposed buildings and footprints. Prepare maps to clarify changes over time, such as 1) current buildings, 2) in 2030 after hospital construction, and 3) other selected estimated time frames between 2030 and 2050.

5.13 Noise

- Comments are similar to those related to other categories. In addition to emissions and hazardous materials concerns associated with the construction period, include evaluation of estimated changes associated with the expected increase in building size and energy use, campus population, housing, and car/shuttle traffic.
- Describe expected mitigation measures to reduce/contain traffic, excavation, delivery and staging, and construction that affect noise.
- Describe expected mitigation measures to reduce/contain changes associated with the expected increase in campus population, housing, and car/shuttle traffic that affect noise.

5.14 Population and Housing

- Prepare a separate housing table that compare statistics and estimates in the 2014 LRDP to similar statistics and estimates for the CPHP, as well as incorporate best current condition estimates
- Prepare separate housing and population timelines that compare statistics and estimates in the 2014 LRDP to similar statistics and estimates for the CPHP, and the projections to 2050.
- We request a UCSF commitment to additional project specific review, including a stand-alone housing EIR, that will provide touchpoints to reassess changes to "baseline" conditions over the timeframe and permit identification of cumulative effects.

5.15 Public Services

- Add EIR consideration of Other Public Facilities to incorporate evaluation of the impact on public infrastructure, such as city rainwater and sewer lines, that would be anticipated as a result of increased campus population and housing under the CPHP.

5.16 Recreation

- See comment on potential shadow impact under Aesthetics.

5.17 Transportation

- Include an analysis of parking availability and expected changes due to proposed construction and housing. This includes reductions due to proposed removal of parking at Millberry Union, the amount of parking associated with new housing, accommodating expected population growth, and construction parking and staging.
- Although not a requirement under CEQA and SF Planning Department guidelines, we request a level-of-service (LOS) analysis of traffic impacts. This is similar to the request

that UCSF made to the developers of the Kirkham Heights Project proposed in 2016-2017.

- We request that traffic analyses be reviewed and updated over the time period of the CPHP to assess changes to baseline and cumulative effects.
- The analyses should be comprehensive, to include the major streets and intersections (e.g., Irving, Parnassus, Medical Center Way Service corridor, Fifth Avenue at Kirkham) and be flexibly designed to monitor all vehicle (personal car, shuttle, ride-hailing, delivery truck, construction) and other modes of transportation such as pedestrian, bicycle, and scooters.
- Describe expected mitigation measures to reduce/contain transportation changes associated with the expected increase in campus population and housing. Include changes to UCSF faculty and employee parking passes and access, shuttle service, programs to encourage and promote use of public transportation (e.g., increase use of Federal pre-tax commuter benefits, additional transportation subsidies to low income workers, taxi/voucher programs for patients or employees who work late hours) and other programs under consideration

5.19 Utilities and Service Systems

- Expand analysis of utilities and services systems on campus to include impact on public infrastructure, particularly rain and waste water systems. See comment under Public Facilities.
- Expand description and discussion of proposed service corridor to include proposed route, and impacts of construction, delivery, traffic, parking, management of Mt. Sutro Reserve, and other potential issues.

5.20 Wildfire

- The Mt Sutro Reserve is a Fire Zone 2 risk. Wildfire risk, including incorporating relevant elements of the Mt Sutro Open Reserve Management Plan, should be included in the CPHP EIR.

5.21 Mandatory Findings of Significance

- This section should include a summary of major mitigation and potential voluntary community benefits to offset expected impacts associated with increases in increased building mass and density, population, transportation and other impacts identified in the EIR development process.

Comments on the proposed Parnassus Heights Plan and EIR

From Tes Welborn 2-21-2020
Community Advisory Group member
Advisory Committee member

Initial Comments

The overall Parnassus Heights Plan is still more of a vision, not quite in the planning stage, and is not ready for an EIR.

For example, at either the February 6 meeting of the Advisory Committee or at the February 10 Scoping Meeting, the idea of some passage under or over Parnassus had suddenly become both a bridge and tunnel. Such changes require extensive consultation with the City of San Francisco.

Overall, the changes contemplated in the Parnassus Heights vision would constitute hugh impacts on the City of San Francisco as well as adjacent neighborhoods. No one arrives at the Parnassus campus by parachute!

1. **Transportation.** Transportation, public bus and rail service, private shuttle and private car all run on public streets and would be vastly impacted by Parnassus Heights vision. The City as a whole and neighbors have a vested interest in traffic and road management.

2. **Utiltities.** Under these public streets run water lines, common sewers and other underground utilities, in some areas including electric power and internet fiber. Bridging over and tunneling under Parnassus Avenue require City involvement. The City and neighbors have a vested interest in subsurface construction, and in right-sizing utilities, as well as planning for and making appropriate utility enlargements, and sequencing these changes into the City's overall planning cycles.

3. **Population.** Campus daily population is projected to increase about 8,000 persons per day, with roughly half of them as workers supporting professional staff and patients. UCSF has already had a major impact on San Francisco for housing professional staff, students, and patient families. UCSF has made and is making some improvements in housing these three populations. The 2014 LRDP, designed to cover campus planning through 2035, included the addition of ---- housing units for professional staff and students. The Parnassus Heights vision has *reduced* – not increased – housing for professional staff and students in the 2020-2030 time frame while projecting an increased campus population.

In addition, as of this date, the Parnassus Heights vision has not yet included any housing for support workers or the construction workers needed over at least the next ten years. There are known guidelines for support workers and professional staff needed per hospital and related gsf.

Nexus studies have shown that for about every 100 new market rate housing units, about 45 low and moderate income housing units are needed, just to stay even with housing needs – not even addressing the backlog of city low and moderate income housing units needed. I expect that UCSF students probably need fewer restaurant workers, local shops' employees, childcare providers per 100 units than average income city residents, but just as many MUNI drivers, safety personnel, etc.

Also, the City has a March 3 ballot measure addressing workforce housing for office buildings. The subject will not go away. The City and neighbors have a vested interest in workforce, professional staff, and student housing, such that the City and neighborhoods do not have residents displaced for UCSF projects.

4. **MOU and Space Ceiling.** The City and neighbors have a vested interest in UCSF's working with the City and neighbors to develop a Memorandum of Understanding to cover transportation, housing, utilities and other subjects, such that UCSF pays its fair share for all needed improvements. **This MOU should include ALL of UCSF's San Francisco facilities.**

? **Space Ceiling**. UCSF entered into an agreement with the City of San Francisco?? To limit both the total gsf and average daily population on the Parnassus Heights campus. UCSF cannot unilaterally terminate this agreement.

EIR Scoping Comments

While I believe that this EIR as currently proposed exceeds its remit, that the hospital and any other major building on campus requires its own EIR, and note that the MOU between the City and UCSF is yet to be developed, for the EIR focusing on the 2020-2030 ten-year period, please study the following subjects:

?Lighting 5.1 d Consider also the night time light impacts on birds, both local and migratory, on [human] neighbors, and on other animal and insect life
5.1 f Consider also bicycle transportation and alternate transportation modes including scooters and skate boards. Also consider the impacts of TNCs such as Uber and Lyft.

Air Quality 5.3 c, e I don't understand the term “sensitive receptors.” It should be better defined. If it is some people and for some things, or other animal life, that should be clarified, and how it would be measured.

Biological 5.4 f Include the state of Sutro Reserve and impacts of construction and additional traffic on its plants, trees, and life forms

Energy 5.6 a Study whether all new energy uses should be all electric, versus some “natural” gas or renewables.

Geological 5.7 a iii-iv Slides hav occurred adjacent to Sutro Reserve. Please study those sites and identify other potential sites. How can slides be avoided or impact reduced?

Hazards 5.9 including f and g This area should include the impact of UC construction and operations during “normal” times and during/post a “seismic event.” This area of study should also include impacts to normal operations of major power outages and various types of disasters, including fire and seismic. For example, how will prospective patients arrive at Parnassus campus from the west if Parnassus Avenue and Irving Street entrance are blocked ? The City has relatively few ambulances [last I heard, about 17], and I don't think they are 4-wheel drive capable [let alone cross-county capable – likely necessary in a major disaster, due to downed power lines, collapsed buildings, etc.].

- In a July 2019 report, new fire maps are expected in 2020. Take them into account.

- Take into account that high winds, such as experienced in the Paradise fire, can turn “moderate risk” into “disaster.”

predicted fire hazards.

- Take into account an Evacuation Plan for Parnassus campus, and segments thereof.
- Take into account that Sutro Reserve vegetation should be studied, too, and could vary considerably over the 10-year, or even 30-year period.

Water 5.10 a Increased water usage needs to be in MOU with the City, as under climate catastrophe, San Francisco's water supplies from snow melt may or disapear.
b Study the impact of non-permiable surfaces and run-off, and of replacing certain areas with permiable surfaces, for ground water recharging and reducing run-off of rain, and perhaps toxic-contaminated fluids.
c iii This also needs to be part of the MOU with the City.

Land Use 5.11 b Sutro Reserve land swaps need to be studied for impacts on Reserve and on adjacent neighbors. I'd include **shadow, noise, and wind impacts** on campus users and on neighbors in studies here.

Noise 5.13 a Noise impacts on staff, patients, their families, construction workers, hospital workers, and neighbors during construction, and during normal operations. A separate EIR for the proposed hosptial must be performed.
d “Doubling traffic”is not acceptable. It needs more than mitigations: it must be addressed in the MOU with the City.

Population/Housing 5.14 More jobs are proposed for addition, without commenserate housing. Ditto more patints with families for longer stays without sufficient accomodations.
a The number, location, and populations served of housing units in the 2014 LRDP, and actual production, need to be compared to the proposed production. It appears the there is an actual reduction of housing in the next 10 years, compared to the LRDP. The addition of jobs, staff, patients, and construction workforce in the near term, next 10 years, is not satisfactorily met by possible additional housing at least ten years out. See my initial comments.
The possibility of UCSF constructing replacement housing elsewhere in San Francisco [or elsewhere?] while displacing currrently housed people should be studied. If done, it will have shorter term [3-10 year] noise, traffic, etc. impacts on adjacent neighbors. It could have long-term positive impacts by increasing the housing supply in San Francisco.

Public Services 5.15 a i Again, the likely need for more nearby fire services by the City must be addressed in the MOU.
a ii Ditto, additional City police and other emergency services, in the MOU.
a iii Ditto, the need for additional City schools in MOU.

Recreation 5.16 a and b Please study the needs for additional recreation services for those on campus, medical and other staff, students, patients, and for neighbors. Recreation/physical therapy for patients may overlap. Some neighbors will want to use UCSF recreation facilities.

Transportation 5.17 I've addressed this in my opening remarks. It is one of the two major points for the MOU with the City.

Utilities 5.19 This includes water and waste disposal. I've addressed this in my opening remarks. It is

another significant point for the MOU with the City.

Fire 5.20 b Study also how slope, normal winds, and high winds can spread fires. There is a need for evacuation plans.
c Ditto
d Also study potential slides and impacts of broken water mains.

From: Maury Zeff
To: Campus Planning - EIR
Subject: EIR comments related to Parnassus redevelopment
Date: Friday, February 21, 2020 10:00:05 PM

Dear UCSF,

As one of the Edgewood Avenue homeowners who would be most impacted by some of the proposed plans we've seen for the UCSF Parnassus redevelopment, I would like to add my voice to those of my fellow neighbors about the EIR. Here are my concerns:

- Regarding the proposed new hospital where Langley-Porter currently is, building a 296-foot tall building (according to one of the concepts we have seen) next to a residential neighborhood consisting of 2-3 story homes would have significant and permanent detrimental impacts on your residential neighbors and the homes that have stood here for over a hundred years. My specific concerns are:
1. Dust and Particulates - For much of the year, the wind in our neighborhood blows eastward from the direction of UCSF. I am concerned that a massive construction project would put dust and particulates into the air and be harmful to residents, particularly the many children who live in our neighborhood. I could see a situation in which our homes would be uninhabitable during construction.
2. Asbestos - Razing the current structure would likely put asbestos and possibly other toxic materials into the air. Again, this would present a health hazard.
3. Noise - The construction noise from a building of this size several hundred feet from our homes would likely make sleeping (or even inhabiting) our homes challenging during the entire construction.
4. Post-construction noise - The noise from such a structure once built would be considerable and would impact our daily quality of life forever. Also, if it's a hospital, the proximity to our homes of ambulances and other emergency vehicles arriving at all hours of the night would be deeply impactful.
5. Post-construction light - The shadow from a building this tall would significantly darken our homes and our street in the afternoon forever.
6. Urban planning - The lopsidedness of a campus in which the tallest building is at the perimeter seems to violate every principal of urban planning. My understanding is that urban campuses such as UCSF would typically have the largest buildings in the center of campus with a gentle lowering of building heights toward the edges as the campus approaches residential areas. It's unfathomable to me why UCSF would be considering violating this reasonable approach to putting major institutions into residential neighborhoods so that the residential and commercial can coexist harmoniously.
7. Staging - How would staging of a construction project like this be done? It's hard to imagine that it wouldn't impact the green space across Medical Center Drive, which is near or next to our backyards, or the overflow parking lot.
8. Transportation & Parking - Have there been studies done to gauge how this overall development would impact traffic on and around Parnassus? As it is, there is not nearly enough parking for UCSF visitors. Many park on Edgewood. What provisions are being made to mitigate this impact?
9. Housing - What provisions are being made to house the larger campus population?

- Regarding one of the concepts we've seen which involves developing into the green space on the east side of Medical Center and digging into the hill on which our 115-year-old houses sit,

can any seismologist, structural engineer, or geologist reliably predict what the structural impact on our homes would be--at the time of construction or in the event of a future earthquake? The possibility that our homes' structural integrity might be compromised by this project is deeply alarming. Such construction would cause the same issues I raised above with regard to the hospital where Langley-Porter currently is.

This is not a case of NIMBY. In general, my neighbors and I are happy and proud to have a world-class medical institution in our community. And we understand UCSF needs to grow as the city and its medical needs grow. Furthermore, many of my neighbors have built their careers at UCSF and have made significant contributions there. But the impact of some of the proposals we've seen would severely impact our quality of day-to-day life. In thinking about our position, I'd ask you to consider how you would feel if such a massive construction project was proposed near your homes. As a starting point, I ask you to consider keeping the major construction in the center of campus, away from your residential neighbors.

Finally, the planning we've so far has been surprisingly opaque. The Edgewood Neighborhood Association has only recently been made aware of this project, yet we are one of the most impacted constituencies. We have not seen specific plans that spell out what exactly the proposed project is. (How can an EIR be done without a firm project plan?) Before we can weigh in, we would like to see plans and models of what exactly is being proposed. Otherwise, it's creating a climate of distrust and concern that UCSF is forging ahead with a project that might make our homes a lot less--and maybe completely--unlivable. I hope and trust that this is not the case. But without more firm plans and transparency from UCSF, it's hard for us not to be concerned.

Thanks for considering my input. I hope that this is the opening of a larger dialogue.

Regards,
Maury Zeff, 119 Edgewood Avenue
(415) 307-5989

Scoping Meeting

Scoping Meeting for the Proposed Comprehensive Parnassus Heights Plan Environmental Impact Report

Public Comment Form

2/10/2020

Thank you for coming tonight. UCSF values your input, and we welcome your comments on the Initial Study for the proposed Comprehensive Parnassus Heights Plan. This comment form is provided for your convenience. Please return this card to UCSF staff at the end of the meeting, or if you prefer to send it to us at a later date, please email to EIR@planning.UCSF.edu or mail to Diane Wong, UCSF Campus Planning, Box 0286, San Francisco, CA 94143. Comments must be received by 5 p.m. on February 14, 2020.

Concerns of proximal neighbors:

1) traffic congestion
2) housing for the vast # of increased workforce
3) earthquake hazard increase for surrounding neighborhoods
4) landslide hazard evaluation
5) noise concern / This vastly increased campus
6) air quality during demolition/construction etc a big concern

Primary concern for immediate neighbors is infringement on our beloved, historic open green space (which mitigates noise, wind, airborne particulates related to research/waste, light etc)
PLEASE respect the current footprint of the med center perimeter. Medical Center Way is absolutely critical to respect as a line of demarcation between the med center and the open green space separating this immense building cluster from historically quiet surrounding neighborhoods on the East

Name

Address Edgewood Ave (Street) 94117 (Zip)

Email irene.bzlcar@gmail.com

Scoping Meeting for the Proposed Comprehensive Parnassus Heights Plan Environmental Impact Report

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Please study / mitigate

(1) Noise + Traffic at 5th Avenue + Parnassus Ave

(2) Ring noise for neighbors

(3) Study Alternative decentralization Possibilities (ST Marys, East Bay Marin + South Bay options to decrease commutes for workers + patients

Name Wm P Dillon, MD

Address 240 Edgewood Ave SF 94117
Street Zip

Email WPD240@gmail.com

Scoping Meeting for the Proposed Comprehensive Parnassus Heights Plan Environmental Impact Report

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2/10/2020

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How tall is the proposed new hospital? what would the impact of that building be on the Edgewood neighborhood? Shading? etc.?

Will ~~Would~~ The EIR ~~should~~ use the map in the "Comprehensive Parnassus Heights Plan"? (we're freaked out about protecting the forest, green space)

We want to have the changes to airborne effluent evaluated. We wonder what new levels of ~~hazardous or~~ emissions will occur due to the hospital both from the hospital and other supporting infrastructure like the power plant and gasses, etc. Also we support dense housing and walkable streets!

Name Mera and Sunil Paul

Address 150 Edgewood Ave 94117
Street Zip

Email mera.granberg@gmail.com

Scoping Meeting for the Proposed Comprehensive Parnassus Heights Plan Environmental Impact Report

Public Comment Form

2/10/2020

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While we appreciate UCSF's many contributions to the medical field & to patient health, & UCSF's changing needs re. increasing the campus size by 1.5 million s.f.:

1. Breaks the space ceiling agreement with the city that limits growth & daily campus population;
2. Proposes a vast impact on adjacent / nearby neighborhoods (A.) without providing money for public transportation - it doubles traffic & adds @ 4,000 workers daily as well as some 4,000 more staff faculty / students / patients (B.) without providing workforce housing for both current workers & the new thousands of future workers (as well as faculty & student housing) [Note: Prop. E]
3. This plan, while worthy in many ways, follows UC's huge expansion at Mission Bay - also @ 1.5 million s.f.
4. At a time when many hospitals are closing, & outpatient ~~work~~ services are increasing, ~~it appears that a~~ and the two new hospitals at Mission Bay & reducing the proposed 1 m-sf new hospital here seems sound.

Name Tes Welborn

Address 2001 Oak St. 94117
Street Zip

Email tes @ @aol.com

5. The EIR is too big & is more "desire" than real plans. Please do smaller chunks.

Scoping Meeting for the Proposed Comprehensive Parnassus Heights Plan Environmental Impact Report

Public Comment Form

2/10/2020

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PLEASE ADDRESS THE EFFECTS OF CUT & FILL ACTIVITIES ON SURROUNDING NEIGHBORHOODS.

I REALIZE THAT THE PROPERTY IS STATE PROPERTY AND THEREFORE NOT SUBJECT TO S.F. REGULATION, BUT IT WOULD BE INTERESTING TO SEE HOW THE PROPOSED PROJECT FITS W/ THE S.F. PLANNING DEPT'S CITY-WIDE PLAN.

PLEASE CONSIDER EXTENDING THE TIME LINE FOR EIR APPROVAL.

Name PETER ROCKWELL

Address 130 MIRALOMA DR., S.F., CA 94127
Street Zip

Email ALFA_PETE@MAC.COM

(1)

SPEAKER CARD
Scoping Meeting for the Environmental Impact Report for the proposed Comprehensive Parnassus Heights Plan

UCSF

2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name ROGER HOFMANN

Address 1550 5TH AVE #402 SF 94122

(2)

SPEAKER CARD
Scoping Meeting for the Environmental Impact Report for the proposed Comprehensive Parnassus Heights Plan

UCSF

2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name Pam Hofmann

Address 1550 5th Ave. #102

(4)

SPEAKER CARD
Scoping Meeting for the Environmental Impact Report for the proposed Comprehensive Parnassus Heights Plan

UCSF

2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name michael OCallaghan

Address 123 Ashwood Ave

(5)

SPEAKER CARD
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UCSF

2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name Tes Welborn

Address

(6)

SPEAKER CARD
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2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name Barbara Smith

Address 1473-6th Ave, SF.

(7)

SPEAKER CARD
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2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name Maria Wabel

Address 1515 5th Ave

(8)

SPEAKER CARD
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2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name Lisa Kessler

Address 161 Edgewood Ave

(9)

SPEAKER CARD
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UCSF

2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name HANS BADAUF

Address 165 EDGEWOOD AVE

10

SPEAKER CARD
Scoping Meeting for the Environmental Impact Report for the proposed Comprehensive Parnassus Heights Plan

UCSF

2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name Maryann Ranney

Address 1318 - 4th avenue

The School of Nursing Comes down
Where will it be rebuilt ?

11

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2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name IRENE EISEN

Address 10 Clarendon Ave (See Over)

12

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2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name SUNIL PAUL

Address 150 Edgewood Ave

13

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2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name Denis Mosgofian

Address 1227 - 10th Ave

(10)

SPEAKER CARD
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UCSF

2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name Maryann Rainey

Address 1318 - 4th avenue

The School of Nursing Comes down Where will it be rebuilt ?

What infrastructure, especially Sewer lines would support the planned expansion of Aldea Student Housing near Clarendon Ave?

(12)

SPEAKER CARD
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UCSF

2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name SUNIL PAUL

Address 150 Edgewood Ave

(13)

SPEAKER CARD
Scoping Meeting for the Environmental Impact Report for the proposed Comprehensive Parnassus Heights Plan

UCSF

2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name Denis Mosgofian

Address 1227 - 10th Ave

(14)

SPEAKER CARD
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UCSF

2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name Kevin Siegel

Address 3761 17th St

(15)

SPEAKER CARD
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UCSF

2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name LORI LIEDERMAN

Address 1227 10th AVE 94122

(16)

SPEAKER CARD
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2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name Maury Zeff

Address 119 Edgewood Ave

(16)

SPEAKER CARD
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2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name JEFF COLE

Address 277 EDGEWOOD AVE.

(17)

SPEAKER CARD
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UCSF

2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name MIKE GRADE

Address 828 ANZA ST., #3

(18)

SPEAKER CARD
Scoping Meeting for the Environmental Impact Report for the proposed Comprehensive Parnassus Heights Plan

UCSF

2/10/2020

If you wish to comment on the Initial Study, please fill out this card and submit to staff.

Name Lisa Kasmus

Address 161 Edgewood.

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ENVIRONMENTAL IMPACT REPORT

SCOPING MEETING

UNIVERSITY OF CALIFORNIA SAN FRANCISCO

COMPREHENSIVE PARNASSUS HEIGHTS PLAN

Monday, February 10, 2020

6:30 p.m.

Millberry Union Event & Meeting Center

City Lights Room

500 Parnassus Avenue

REPORTED BY: JANA OSATO, STENOGRAPHIC REPORTER

APPEARANCES

---oOo---

ALICE MURASAKI, Assistant Vice Chancellor, Campus Planning, UCSF Real Estate

DIANE WONG, Principal Planner, UCSF Real Estate

CHRISTINE GASPARAC, Senior Director, Community Relations, Office of Community & Government Relations

ERICH BURKHART, Principal, Perkins Eastman

HILLARY GITELMAN, Director, Environmental Science Associates

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I N D E X

---o0o---

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Monday, February 10, 2020 6:32 p.m.

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INFORMAL COMMENTS

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(Presentation and comments)

UNIDENTIFIED SPEAKER: This is called "The Plan For The Future." Is that defined by 5 years? 20 years?

CHRISTINE GASPARAC: It's a 20-year plan.

UNIDENTIFIED SPEAKER: 30 years.

CHRISTINE GASPARAC: 30 years, sorry. Anybody else? Erich's going to talk some more about that.

ERICH BURKHART: So with this plan, we think we can alleviate a bit of the connect -- the congestion that occurs because right now we're basing all outpatients and all inpatients, ambulances, and whatnot all up and down that side of Parnassus Avenue.

UNIDENTIFIED SPEAKER: How are folks coming from Irving? Are they coming on public transit or --

ERICH BURKHART: Yes.

UNIDENTIFIED SPEAKER: By car?

ERICH BURKHART: Yes. Now -- now, I'm glad you asked that question because one of the other things we want to do with this whole campus plan was to

discourage cars and -- and to have fewer of them and encourage the use of transit and encourage pedestrian access, the walkability of the campus, for example.

So we're actually -- I'll come to this -- some housing in a moment. We're trying to make the campus much more attractive to not have to depend upon cars.

UNIDENTIFIED SPEAKER: Another question on that.

ERICH BURKHART: Yeah?

UNIDENTIFIED SPEAKER: I understand that, but how does that relate to patients who are acutely ill or pregnant or whatever getting to the campus? They're not going to ride bicycles and watch a --

ERICH BURKHART: No, no, no, you're right.

UNIDENTIFIED SPEAKER: I mean, realistically, it's nice to say no cars, you know, more or less cars.

ERICH BURKHART: Yeah.

UNIDENTIFIED SPEAKER: I understand.

ERICH BURKHART: Well, let's see. Now one of the other -- is a pointer. Okay. This is the new hospital. And the idea behind the new hospital is the main entrance, inpatient, would be up there on Parnassus. In a similar vein, we are -- the master plan imagines a new, what we call our -- our "new, unified lobby" which would thread -- which would pull

people, the ambulatory traffic from Irving down here, up into this unifying lobby. We're talking about having these great big glass elevators going to come up the outside of the parking garage out here [indicating], then bring you into this new integrated lobby.

And in that lobby space, we're talking about creating this -- for the few people that do have to do -- do have to use a car, having this interior patient pickup and drop-off spot so that we're not clogging up Parnassus, also having an interior Uber and Lyft pickup and drop-off space. That's all part of this new, integrated lobby. And -- and that would be just off Parnassus on the --

UNIDENTIFIED SPEAKER: What about folks who are coming from -- away from -- not San Francisco because I know there are folks coming to your facilities from all over the state. And they come here with their vehicles. How is that going to work with drop-off, pickup spots?

ERICH BURKHART: You know, we -- those are all great, detailed questions that we -- we did a whole mobility study which looked at all the transit options on the car options, whether people were coming from across town or across the state. And we've got a lot

of information about that. But I would have to ask that we get into that a little bit later with you and -- and address -- those are real important questions and very key to the success of a plan. But there's a lot of detail associated with that.

UNIDENTIFIED SPEAKER: Just on the arrival thing, if that's also -- where are the ER and ambulance bays?

ERICH BURKHART: Oh, I don't know just yet. What's happening -- see, remember, these are opportunity sites. We haven't -- that -- that blue bit there where it says "Clinical East," that hospital has not yet been designed. Now, this group and other community groups are -- when that design occurs, there will be lots of public hearings associated with that. So all we're saying --

UNIDENTIFIED SPEAKER: I was just thinking, if it's part of the transportation flow, because the ambulance coming in and out and parking, that's a big deal as far as flow.

ERICH BURKHART: Yeah, yeah. I -- I -- our notion is that it would not be -- the entrance is not going to be on Parnassus. There -- the --

UNIDENTIFIED SPEAKER: How are they going to get there?

ERICH BURKHART: Well, you see the back -- across the back side there is Medical Center Way.

UNIDENTIFIED SPEAKER: Yeah, I know. I live there.

ERICH BURKHART: Yeah, okay. Well, the -- the idea is that the ambulance entrance would not -- right now, the ambulance entrance is sort of cheek by jowl with the front door. Right? And that's awkward. And so by pulling the ambulances around to the back side, we -- we can hopefully alleviate some of that street congestion.

Now, they've still got to get here from around town, but that's -- that's the idea, to have access from -- instead of having access all from one side, having access from a different side of the hospital. But that has to be designed. That's something --

ALICE MURASAKI: So I appreciate the questions, but how about we let Erich finish.

ERICH BURKHART: Let me just take that because some of these -- yeah, let me keep going here just a little bit. Since you're asking about access, one of the big ideas about the master plan -- see that thing, the service corridor? One of the things that we wanted to do here is have Medical Center Way come all

the way around and connect back into Fourth Avenue here as an under, partly undergrade, underground service core so that all of our service vehicles would be accessing not just the hospital but all the various campuses.

This is the way Disneyland works, for example. There's a -- an underground utility level below. So all of that, we want to get all of the service vehicles off Parnassus if we can.

Then the next big bit here is the academic -- the green bit is the academic and research --

UNIDENTIFIED SPEAKER: But does the purple cross over -- that road, does it cross over? The purple side, does it cross it cross over to the green spot?

ERICH BURKHART: Does the -- which one?

UNIDENTIFIED SPEAKER: The Clinical East end --

UNIDENTIFIED SPEAKER: Cross over the existing Medical Way?

UNIDENTIFIED SPEAKER: Does it cross over the road?

ERICH BURKHART: Not in this plan.

UNIDENTIFIED SPEAKER: Okay.

ERICH BURKHART: Yeah.

UNIDENTIFIED SPEAKER: Because the one that distributed with that neighborhood, it crosses over into the park.

ERICH BURKHART: Well, again, I am -- we're talking here about a master plan. You're talking about something that may be designed in the future. I -- I -- we would have to defer on that because that's not -- that's not what this plan is -- that's another question.

UNIDENTIFIED SPEAKER: It's already drawn. We looked at it.

LISA KESSLER: They put it on the last meeting.

UNIDENTIFIED SPEAKER: Yeah. Now they have it burrow into the hillside.

UNIDENTIFIED SPEAKER: Yes. It comes into the --

ALICIA MURASAKI: Hi. So just maybe to clarify a little bit. We're looking at a master plan, and none of these buildings have yet been designed. But you are right. We have been doing some programming and master planning specifically for the hospital, the new hospital, which is the -- where it says "Clinical East End" and there's an arrow coming to it.

UNIDENTIFIED SPEAKER: Yeah.

ALICIA MURASAKI: So since this was published in October. There's been continuing work on the hospital. So the shape of that and how it might touch the road and that edge there, just along where the -- the current Medical Way is is being looked at.

But all of these questions are really great and the purpose of the master plan is not to answer all the questions of what the future design of the hospital would be, but we would love for you to write or put in a speaker card to include in the scoping bit because these -- this is your chance to tell us what is important to you so we make sure we study that in the environmental impact report.

So if the transportation or Medical Center Way or the shape there of -- of the hospital does not -- when it gets designed, please, that's what we really want to make sure we capture tonight.

LISA KESSLER: The reason we're concerned about this is because the existing --

UNIDENTIFIED SPEAKER: Can I ask a question?

LISA KESSLER: -- environmental proposal shows this. And if you're going to use a new footprint and a new master plan, the existing environmental proposal doesn't address the environmental issues of going into the woods.

ALICIA MURASAKI: Yes, and there will be another public process as -- as we were just talking about, when the hospital design gets a little bit further developed. But we don't have enough information to do a -- an environmental impact report on the new hospital today.

LISA KESSLER: Okay. But so --

ALICIA MURASAKI: So the plan --

LISA KESSLER: -- your existing one is not accurate. Right? We can't vote on proceeding with it if the footprint is not clear.

ALICIA MURASAKI: So tonight, we're talking about the whole master plan.

ERICH BURKHART: Just the master plan tonight.

LISA KESSLER: So what's being approved in -- what's being passed on the 14th? What is the comments that we have to submit?

ALICIA MURASAKI: So we would like your comments on the plan, not an individual building --

ERICH BURKHART: This plan.

ALICIA MURASAKI: But this plan. Not an individual building. So --

LISA KESSLER: So this is the plan you're proposing, not the one that goes into the woods?

ALICIA MURASAKI: So in the Comprehensive Parnassus Heights Master Plan, the idea of these building sites as opportunities for the future and approximately this -- these massings in these locations -- so you can see there's more on the clinical side, and we've added things on the housing in the west end. So we'd like your comments to us on what we need to make sure we study over this 30-year --

ERICH BURKHART: Let's comment on --

LISA KESSLER: Okay. Keep going.

ERICH BURKHART: Let's comment on the master plan --

LISA KESSLER: Well, because we don't know which plan we're commenting on.

(Simultaneous speakers; unintelligible)

UNIDENTIFIED SPEAKER: I don't understand what the plan is.

UNIDENTIFIED SPEAKER: Well, give them a chance to explain it.

UNIDENTIFIED SPEAKER: Yeah, I think we cannot judge on opportunity site if we don't have specific. That was my problem when I read the whole thing. I don't have specifics, so how can I guide or ask the right questions because we don't know what to ask because we don't know what's going to be there?

Just because it's an opportunity site doesn't help us as neighbors to be clear what's going to happen.

UNIDENTIFIED SPEAKER: It's really vague. And then you can do the bait and switch where you say "you guys approved this" and then later on, you go into --

(Simultaneous speakers; unintelligible)

LISA KESSLER: Specifically, it's an environmental impact plan. So the idea of going into the woods as opposed to staying on the existing approved-by-the-Regents-in-2014 campus footprint changes the environmental impact plan. So you kind of have to start over.

ALICIA MURASAKI: So we'll --

(Simultaneous speakers; unintelligible)

LISA KESSLER: The list of things that you're addressing in the EIR where you check off the boxes of what you think is relevant changes if you go into the forest. The relevance is difference.

ALICIA MURASAKI: So -- so we are trying to take this in two -- at least two phases. So there is an environmental impact of this overall plan, and you're right. We do not have specific buildings designed, but we would like to envision what Parnassus Heights will be over a 30-year development.

Then when we come back and we have information about the hospital building, we will come back and we will do it an environmental --

LISA KESSLER: What's the order of the hospital building?

UNIDENTIFIED SPEAKER: That's different.

ALICIA MURASAKI: We will do an environmental impact report with the duly required public process about the hospital building. So we have an idea that, because of the way clinical services are provided today at the sizes required to provide the best clinical care, that we need a bigger footprint at the base of the hospital building. And there is some indication of that in the -- in the documents that we will be preparing. But it is not the full design or plan of the hospital.

We will come back for the hospital.

(Simultaneous speakers; unintelligible)

ALICIA MURASAKI: I'm sorry. So I can't comment when everyone is talking. So it would be really nice if we could let the -- our guest finish telling you about the overall plan and then --

UNIDENTIFIED SPEAKER: Well, we want to comment on the overall plan before he tells us more. The hospital is the most central place east of this

thing. And so if we don't like where it is, we should comment now so that you can redesign this whole thing, put the hospital somewhere else, and then they could vote on that.

ALICIA MURASAKI: So the purpose of tonight is to gather the things that are important to you so we can study them. So in --

(Simultaneous speakers; unintelligible)

UNIDENTIFIED SPEAKER: There's something represented here on a map. And while I understand that the individual building design has not been resolved, it is represented that the boundary within which each of these opportunity sites exists has been resolved; is that correct or not?

LISA KESSLER: And it's been resolved by the university, right?

ALICIA MURASAKI: So we have some ideas of the direction that is heading. We have not made any plans as to the exact size and shape of the hospital. We have been studying that. And so we -- it's a very complicated thing, and we have to give the team the time to actually do and design that. So we're not --

UNIDENTIFIED SPEAKER: What about the roads? Are the roads --

ALICIA MURASAKI: But we are not --

UNIDENTIFIED SPEAKER: -- subject to change?

ALICIA MURASAKI: We are not coming to you with a fully baked plan and saying approve this plan for the hospital.

UNIDENTIFIED SPEAKER: You have a date already to submit the EIR to the Regents in November.

LISA KESSLER: And the EIR gives --

(Simultaneous speakers; unintelligible)

LISA KESSLER: But does the EIR include that pie-shaped piece of the forest or not?

UNIDENTIFIED SPEAKER: Right.

LISA KESSLER: Does it cover that? Because the EIR was drafted for this footprint, and you're asking for a different footprint that changes the environmental impact dramatically.

ALICIA MURASAKI: So this is a plan that was published from a very robust community process in October.

LISA KESSLER: Okay.

ALICIA MURASAKI: Since October, the hospital team has continued to study what is required for a world-class hospital. And, yes, things have changed. And, yes, we do talk about that in the documents.

But what you're approving on the 14th is not an approval of anything. It is --

LISA KESSLER: We're approving the scope of the EIR.

ALICIA MURASAKI: We are asking for your input into what we should study.

LISA KESSLER: So what I'm saying is what you offer to study is based on a different footprint than what you're going to do. So you need to study different things if you make a different footprint.

ALICIA MURASAKI: So, yes. If you let us continue with the presentation, you'll get to see more information specifically about that.

LISA KESSLER: The EIR?

ALICIA MURASAKI: Yes, yes.

LISA KESSLER: Okay. Go for it.

DIANE WONG: And I'd like to ask that folks who want to speak if you can give me your comment cards so we can just respect kind of the process and allow everybody can get a chance to ask.

(Simultaneous speakers; unintelligible)

ALICIA MURASAKI: You don't want to speak? If we could let our speaker --

ERICH BURKHART: I just --

ALICIA MURASAKI: -- finish.

ERICH BURKHART: -- I'm almost done, actually.

(Presentation continues)

ERICH BURKHART: And the buildings all have little slots, and they're separated so that we can maintain access points and have this connection, this park to peak. And you can see in some of the little gaps here that, where we're trying to --

LISA KESSLER: What about the gaps in the clinical east end?

ERICH BURKHART: I'm sorry?

LISA KESSLER: What -- are there gaps in the clinical end as well as to connect it?

ERICH BURKHART: Not as much, but that's up on a upper level, not at the base. But -- but we'll come -- let me come back to that in just a moment.

(Presentation continues)

ERICH BURKHART: We're trying to concentrate the service traffic on that back side and leave Parnassus Avenue and Irving for visitors and patients and students.

UNIDENTIFIED SPEAKER: Is that one-way traffic or two?

ERICH BURKHART: Yeah, it's a one-way.

And it's multilevel. It would be vehicles down at the base and utilities down below and then some vehicles above that. And then above that, it's

covered, and we have this park connection to the -- to the, you know, over it, up to Mount Sutro.

UNIDENTIFIED SPEAKER: Are you suggesting parking underneath that?

ERICH BURKHART: No, no. Not parking because remember --

UNIDENTIFIED SPEAKER: It's a very large parking lot that you're now getting rid of, right?

ERICH BURKHART: Oh, which one? Around the School of Dentistry?

LISA KESSLER: No, the north side gateway.

UNIDENTIFIED SPEAKER: The Kirkham Street parking lot.

ERICH BURKHART: No, I'm not talking about the north side gate one just yet.

UNIDENTIFIED SPEAKER: They're talking about the west side next to Fifth.

ERICH BURKHART: Next to Fifth.

UNIDENTIFIED SPEAKER: Multilevel parking structure.

ERICH BURKHART: Yeah, now again, I have -- I got to defer to our mobility segment. We did a whole parking projection on -- on the use of vehicles here at Parnassus as well as in San Francisco in general. And at the -- how many people are going to be using their

cars 30 years from now and how these alternative methods of transit are -- are reducing the demand on cars.

So we can get -- in fact, the EIR will specifically, I think, get into that in quite a bit of detail. So that's the green bits and the yellow bits.

(Presentation continues)

ERICH BURKHART: It will also be part of the public realm because what we're talking about here is having a thing called Science on Display that will celebrate the discoveries -- the great discoveries that are made here but also to engage the community in the work that's going on here.

UNIDENTIFIED SPEAKER: Now does Park Way, does that go down between the buildings, that's what -- what we're seeing there?

ERICH BURKHART: What, this?

UNIDENTIFIED SPEAKER: Yes.

ERICH BURKHART: Yeah, it -- it's, yeah, it's a -- it's a big, public park if you will.

LISA KESSLER: It's going to be at quite an angle, right?

ERICH BURKHART: Well, and that's another thing. That is another thing that the EIR studies. But we're very worried about the wind. It gets a

little chilly out here.

UNIDENTIFIED SPEAKER: And it's very steep as far as mobility. I know that it's like --

ERICH BURKHART: No, no, no, no. I -- yeah, but no, no, no, no. The parking garage is still under -- this thing is sitting on top of a plinth of parking, you guys. We're not -- we're not going all the way down.

LISA KESSLER: It's on top of the parking garage.

ERICH BURKHART: Yeah, that's right. That's right.

UNIDENTIFIED SPEAKER: So where does the replacement for the building we're in, for the gym and the meeting rooms and --

ERICH BURKHART: Yeah, all of that stuff is -- well, that remains to be -- it -- part of that square footage, those assignments. Some of that would be here. If it's more student related, some of it might be up in the green parts. But those are all the details that would be worked out as projects are imagined over the next 30 years.

UNIDENTIFIED SPEAKER: I think what would have been really helpful -- and -- and now it would be if we could get sort of timelines related to these

different things.

ERICH BURKHART: I'm glad you brought that up.

UNIDENTIFIED SPEAKER: I know this is a concept --

ERICH BURKHART: Yeah.

UNIDENTIFIED SPEAKER: -- but it just seems to be such a fuzzy concept. I really can't understand much of this.

(Simultaneous speakers; unintelligible)

ERICH BURKHART: I'm glad you brought this up because one of the problems here at Parnassus is everything is built. There is no play. You -- you can't turn around without bumping into something. So we have to create -- we have to very carefully phase this so we begin to create -- we have to tear something down to build something new. And we have to put those people that are in that thing that we'd be tearing down somewhere.

So this plan imagines four different projects in the next 10, 15 years or so. One is the hospital there that we were just talking about. Another is a new research building where -- more or less where UC Hall sits today. And that would be -- I'm sorry. It's not -- be research and academic classrooms and the

like. And then number three is to enhance that Irving Street entrance, you know, how we could -- remember, part of this plan is to encourage outpatients to come and everyone who's coming from Irving to have a much better experience as they come up and pass over to Parnassus. And number four, on the other side of Mount Sutro, is some additional housing at Aldea.

(Presentation continues)

ERICH BURKHART: This is standing on Fourth Street [sic], that new Fourth Street, looking up at these series of steps up to that promenade that runs from the west here all the way to Saunders Court on the east side.

I'm sorry?

UNIDENTIFIED SPEAKER: Right parallel to Parnassus Street, right?

ERICH BURKHART: Yes, yes.

UNIDENTIFIED SPEAKER: And I mean, I don't understand how we can plan a street parallel to Parnassus with -- when we know we can barely sometimes make it up the hill or down the hill because of the wind. This is not how it will look.

ERICH BURKHART: Yeah.

UNIDENTIFIED SPEAKER: There will be not one person out there.

(Simultaneous speakers; unintelligible)

ERICH BURKHART: Hold on. We are very concerned about the wind. And I'll show you this here. But that's not a reason to build everything over. It is very important that we have public outdoor space. And yes, it might be a little bit windy sometimes, but -- but that's something --

LISA KESSLER: But the people in coats (unintelligible)

ERICH BURKHART: Yeah.

(Simultaneous speakers; unintelligible)

ERICH BURKHART: Yes, we have wind studies that are part of the EIR. And we -- we found a whole series --

UNIDENTIFIED SPEAKER: Wait. I thought you hadn't started the EIR.

ERICH BURKHART: No, no, no, no. We did a wind study to do this part of the plan. The EIR, I believe --

UNIDENTIFIED SPEAKER: Yes.

ERICH BURKHART: -- it does address more specifically wind.

LISA KESSLER: How can you do a wind study without knowing the height of the building?

UNIDENTIFIED SPEAKER: You haven't scoped it

yet.

ERICH BURKHART: Well, what we did -- I'll show you.

LISA KESSLER: Isn't that relevant to the wind?

ERICH BURKHART: Yes. So what we do is we build a model of this, and you test it. You test it within -- in wind tunnels. And -- and you -- you under -- we have a --

(Simultaneous speakers; unintelligible)

UNIDENTIFIED SPEAKER: It's an iterative process. And you have to start with a -- with a precept and test that and modify it according to what you find.

ERICH BURKHART: Yeah.

UNIDENTIFIED SPEAKER: You can't just come up with a final design.

ERICH BURKHART: Yeah, yeah. And that -- I'm glad you raised that point because see, like -- like that Number 2 building, for example. The absolute -- the shape of that, the way the edges are handled, if there's a little covered promenade along its base, if there are little fins in the building, all of that will come out of further study because a wind tunnel will say, well, you've got, you know, 30-mile-an-hour winds

coming down here. So we have to figure out how to handle that.

This, we're not -- these are not designed yet. But we were concerned about wind nevertheless because we want to shape the building so that we -- so that the shape of the building wasn't intensifying the wind problem. In fact, that -- the wind -- the wind studies that we did do led us to some of these shapes that you see here.

Yes, sir.

UNIDENTIFIED SPEAKER: My understanding of the EIR process is that alternatives need to be studied. Is -- and I would like to specifically request that an alternative be studied that does not locate a -- a -- a building that is greater in size than the historic relationship of the Langley Porter buildings to the Edgewood neighborhood.

That's a historic set of relationships. Langley Porter might, in fact, even be a historic building from an architectural point of view. And I think that requires a study that envisions a different location for the hospital because, as you say, the hospital -- you need to replace the hospital as your first move.

And I don't think it is fair to necessarily assume from an environmental point of view that that is

the only right place for hospital. Will you, in fact, study a no-impact of changing to the neighbors on that site?

HILLARY GITELMAN: We're starting to get into the comments that we want to get on the EIR. We can transition to the --

(Simultaneous speakers; unintelligible)

UNIDENTIFIED SPEAKER: There you go. Okay. I'll shut up for a while.

HILLARY GITELMAN: Okay. Super. We're starting to get to the good stuff, so I wanted to cut to the chase and give you just a quick overview of the CEQA process, and then we'll get to your comments.

First, let me reintroduce myself. My name is Hillary Gitelman. I work for ESA, Environmental Science Associates. I'm here with my colleague Paul Mitchell. We basically do EIRs for a living. And we are supporting UCSF in the preparation of the EIR on this project.

So let me just briefly talk about the CEQA process. You guys have probably all lived in California for a long time and you know all this already. But we are doing this because of the state law which requires us to look at the physical environmental effects of a project before a decision is

made to carry out that project.

So in this case, UCSF has determined that an EIR is required in order for the Regents to consider the adoption of the plan you've been hearing about. So the EIR has to be done before they can make that decision.

The EIR is not going to make a recommendation, but it's going to consider impacts, alternatives, mitigation measures. And we're going to try and get it done with some efficiency, but it depends largely on public input.

So here we are at the public scoping process. The idea here is that we want to get your questions and comments on what the EIR should look at. We've already heard some great questions this evening about the project description, what is the project going to be; we've heard a suggestion about alternatives; we've heard questions about traffic and how that's going to be analyzed; how much parking is going to be assumed and what does that mean. All those are issues that we have to consider in the EIR, and they'll end up determining the impacts as we lay them out in the EIR.

SO --

UNIDENTIFIED SPEAKER: You've done a Draft EIR based on a draft plan.

HILLARY GITELMAN: Well, we -- we haven't done a Draft EIR yet.

LISA KESSLER: You've done a scope of work --

HILLARY GITELMAN: We're going to hear comments today.

LISA KESSLER: -- a proposed scope of work --

HILLARY GITELMAN: No.

LISA KESSLER: -- based on a --

HILLARY GITELMAN: No, no. What we're doing tonight is scoping the EIR. So we're asking for your comments. And if you feel you don't have enough information on the project, you should make that as a comment because we, as the authors of the EIR and preparing the EIR, we are going to have to take your -- your comments into consideration as we move forward.

And then the beauty of the CEQA process, in my humble opinion, is that once we prepare a Draft EIR, we circulate it as a draft. So if we don't get it right, if there's something missing, if there are issues you think haven't been adequately addressed, you will have an opportunity to comment on the draft before it's finalized. Then every comment we get on the Draft EIR, we have an obligation to respond to, in writing, before the Final EIR is prepared and presented for Regents.

UNIDENTIFIED SPEAKER: So this isn't the Draft EIR?

HILLARY GITELMAN: It is not.

UNIDENTIFIED SPEAKER: Okay.

HILLARY GITELMAN: What you have before you is an initial study that was circulated with a Notice of Preparation.

The notice says we are preparing an EIR. And the initial study tries to lay out which issues we're going to look at in depth and which we think are really not that important. And if you got a chance to read through that initial study, there are very few of those issues that we said we're not going to analyze in detail. Most of them, we're going to give a lot of attention to and focus in our draft.

So tonight, we want your comments orally. But if you want to talk or if you have more to say than you can do in your three minutes or this evening, we would look forward to getting your written comments by the end of the week. And all of the comments we get are going to help us prepare that Draft EIR.

Now, we've already heard folks raise some questions about issues that we'll have to consider. Wind has been brought up. Traffic has been brought up. Also, the reserve, sort of penetrating into the reserve

and that kind of land use issue, or maybe it's a resource issue. These are the topics under state law that we're going to look at in the EIR.

So we want to hear from you if there's any particular way we should be looking at these issues, aspects of the project you don't understand as it relates to these issues or things we should make sure to look at as we study the project in this -- the alternatives to the project, any one of those issues.

Yeah?

UNIDENTIFIED SPEAKER: A couple of questions. Normally, I'm used to city planning departments or city governments actually contracting for the EIR. How does it work with the State of California being the client? There's sort an inherent conflict of interest for you, as a professional, because the very body that is hiring you wants a certain outcome.

HILLARY GITELMAN: Well, it's the same as if a city would hire us to analyze a general plan or a specific plan that they're doing. I mean, our job is to be objective, to follow the state law and to come up with an analysis that we can stand behind and that you will have a chance to weigh in on.

UNIDENTIFIED SPEAKER: I guess one of the things that's confusing us is as a neighborhood --

HILLARY GITELMAN: Yeah?

UNIDENTIFIED SPEAKER: -- is that a design is being done on a hospital prior to an approved plan. And I think it's creating a culture of resentment and distrust.

HILLARY GITELMAN: Okay.

UNIDENTIFIED SPEAKER: And I have to ask a question, because my grandparents grew up, lived on the same street -- not same house that I did -- and I remember that there was a very serious blow-back in this neighborhood. And -- and I think that how this is handled is very important to the outcome of all of this.

And I'm curious, there was a square foot limit that was agreed to --

UNIDENTIFIED SPEAKER: (Unintelligible)

UNIDENTIFIED SPEAKER: -- and that I -- and I'm curious where that square foot limit now stands in the analysis of this.

(Simultaneous speakers; unintelligible)

HILLARY GITELMAN: Let's get to one or two more slides, and we'll get to that, yeah.

UNIDENTIFIED SPEAKER: Okay. But -- but if you were going to modify that limit, will the full analysis be done which also analyzes the impact on UC

of a neighborhood lawsuit stopping the project?

LISA KESSLER: Or a social media campaign at UCSF and how they are fighting the community.

HILLARY GITELMAN: Understood. Let me just go a little further. Okay? Okay. So this is an important part of the answer to your question and -- and the easier to answer your first question was yes, we're going to analyze the project and its impacts. So but --

UNIDENTIFIED SPEAKER: But that sounds like jargon. I don't -- you will analyze the -- increasing the square feet?

HILLARY GITELMAN: Yes.

UNIDENTIFIED SPEAKER: Okay. But that has been -- is that agreement actually not legally binding?

LISA KESSLER: That was addressed in 2014, right? That was already --

HILLARY GITELMAN: Great segue. Let me just get through this leg. Okay?

So 2014, the university did another EIR, the LRDP --

LISA KESSLER: Going to 2035.

HILLARY GITELMAN: -- looked at all of their campus sites. And we are going to make use of that EIR to the extent that we can in our EIR. So any

information and analysis that hasn't changed, doesn't need to be updated, we're going to try and make use of that.

LISA KESSLER: Does this include the expansion of the campus into Mission Bay and the removal of the pediatric hospital?

HILLARY GITELMAN: We are focusing on this campus to the --

LISA KESSLER: But it changes your square footage, right?

HILLARY GITELMAN: -- to the extent that the LRDP information can be reused, we will reuse it or reference it.

UNIDENTIFIED SPEAKER: Yes, but --

HILLARY GITELMAN: But we are preparing -- okay. Let me -- let me talk.

UNIDENTIFIED SPEAKER: There is some legal document from way before 2000 --

(Simultaneous speakers; unintelligible)

HILLARY GITELMAN: I understand. I understand it's legal and it's binding.

UNIDENTIFIED SPEAKER: But I don't understand what you just said, if I may just go to that.

HILLARY GITELMAN: Okay.

UNIDENTIFIED SPEAKER: I think you cannot

reuse anything out of the LRDP 2014 because the connecting our -- the heights, the vault, the everything is changing. And so I don't see how you can use any of the EIR from 2014 in your analysis.

HILLARY GITELMAN: Okay. Thank you.

You've reached your conclusion before I have, but we may get there. We think right now there may be things that we can reuse, but we are preparing a new EIR. To the extent we need to do additional analysis, that's the forum for the additional analysis. We are going to analyze the impacts of the proposed plan at the detail we have. Okay?

We're trying to get from UCSF and from you your questions about what the definition of this plan and we're trying to analyze it at the level of detail we have.

We're going to have some more detail about some of the early-phase buildings. And that's going to help us do more in-depth review of that early phase.

Erich mentioned the Irving Street arrival, the RAB or the research and academic building, the new hospital and the first phase of the Aldea densification. So those kind of near-term projects -- and there may be a few more -- will be analyzed at a greater level of detail than some of the rest of the

plan that's way out there in the future.

Then let me explain how an EIR is used. So let's say we get to the end, we have a certified EIR. Let's say the Regents adopt the plan. And then someone comes to -- or the University decides, "We're going to do the first implementation project." Then the EIR is used throughout the planning project to assess that project and whether its impacts have been adequately addressed. We hope we are writing an EIR so that we will not have to do another environmental review on the Irving Street arrival; so we've analyzed it at sufficient level of detail that it will not require subsequent environmental review.

Now, one of the early phase projects we know already will require subsequent environmental review, and that's the hospital -- because we hopefully will know at the time we're drafting this EIR and based on your comments, what the height and the mass and all that is. And so we can analyze it at a -- you know, we can analyze it in this EIR; we're going to do a wind study; we're going to look at shading; we're going to look at this footprint, et cetera.

But we already know we don't have a detailed design, so we're anticipating having to do a second EIR after this one on the hospital itself.

LISA KESSLER: But this EIR specifically says "The proposed hospital between Medical Center Way and Moffitt Hospital." So this EIR is irrelevant if the footprint extends beyond that.

HILLARY GITELMAN: You know what, I want you to make -- when we get to the comments, please, it would be really useful for you to say --

LISA KESSLER: Okay. Well, I guess I -- I'm trying to see is this EIR proposal even worth talking about at this point if we're going to not --

HILLARY GITELMAN: We want to add -- we want to analyze the hospital, the impacts of the hospital to the extent the hospital design is defined.

UNIDENTIFIED SPEAKER: So what is the height of the hospital that you're going to be using?

HILLARY GITELMAN: I don't know.

(Simultaneous speakers; unintelligible)

HILLARY GITELMAN: The best thing I can say is please request that we use the design that you have seen that is causing you --

LISA KESSLER: Then you need to redo this because that doesn't reference that design at all. Thank you.

UNIDENTIFIED SPEAKER: Would it have been somehow more prudent, since this is a really large plan

over a number of years, to take it in smaller bites and say I'm going to do the EIR for something that I hope to get built in the next three years or five years.

UNIDENTIFIED SPEAKER: Look, they can't do that. They have to do the whole thing because -- but the hospital is the main spot. And it needs to -- they need to find a place for the hospital.

The first rule needs to be you cannot touch any green spaces. We only have a finite amount of green space in the city. So do not get into the woods. That should be out of that.

HILLARY GITELMAN: Okay. Then, you guys, let's get to the end because we want to have -- we want to have the kind of process that we anticipated here. We've heard a lot of screaming from the audience, but what we really want to do is have an orderly listening session where we get the comments and make them relate to the EIR. I mean, you guys have great input. I mean, this is all working and telling us how to craft the EIR and its analysis. But it would be really helpful to -- to put it in -- you had it -- you had a suggestion about alternatives. Let's put it in the record so our court reporter can get it down. I'm going to hand over the microphone to UCSF, and we'll move on to the public comments.

---OOO---

FORMAL PUBLIC COMMENTS

ALICIA MURASAKI: Thank you. This is really the meat of the meeting. This is us trying to listen. So I do ask that, if we could respectfully make our comments so the court reporter can record them so that we can make sure that we respond to each and every one of them -- I understand this is our community and there's a lot of passion. But I am asking that we do this in a respectful and orderly way so we can get everyone's comments and suggestions recorded.

So on that note, I'd like to introduce my colleague, Diane Wong. She's going to facilitate this next section where we will be listening to your comments and we will take them in many forms.

DIANE WONG: Thank you. All right. So if you would like to speak and you have not yet filled out a speaker card, please do so right now. So there will be speaker cards available.

We're going to -- as Alicia mentioned, we have a court reporter so that we can accurately record all of your comments. We are going to institute a time limit of three minutes. And if everyone -- just so that everyone has a chance to speak. And once everyone

has spoken, if you would like to speak again, you are allowed to do so.

So I'm going to call up the first three speakers. And if you could line up at the microphone, that would be terrific. So the first --

UNIDENTIFIED SPEAKER: (Unintelligible)

DIANE WONG: You want to turn the microphone around in the front. Okay? The front.

UNIDENTIFIED SPEAKER: This should face the court reporter here.

UNIDENTIFIED SPEAKER: If you struggle with mobility, just let me know. I have another microphone. I can walk over to you.

UNIDENTIFIED SPEAKER: Okay. Thank you.

DIANE WONG: And before each of you speaks, if you could please indicate your name. And if you belong to an organization, if you could please cite that organization. Thank you.

So the first three speakers: Roger Hofmann, Pam Hofmann and Michael O'Callaghan.

ROGER HOFMANN: Hi. My name is Roger Hofmann. I live on Fifth Avenue south of Kirkham. My requests: First, please analyze the sheer stress on buildings from landslides that may occur under wet seismic conditions. It is well established

that landslides occur during earthquakes. It is also well established that landslides occur when the ground is wet. Please consider the worst case: What happens to the campus if both occur at the same time?

Second, please hold yourselves to the development standards San Francisco requires of properties located in landslide hazard zones per guidelines given in the San Francisco Slope Protection Act. Please engage an independent -- independent third party for peer review of landslide hazard and create an independent structural advisory committee for the project.

The San Francisco Department of Building Inspection's Slope Protection page shows two maps: a seismic hazard zone map and a slope map. Inclusion in either map requires developers to comply with San Francisco's Slope Protection Act. The Parnassus Heights campus is in -- is within the hazard zone of both maps.

The Parnassus Heights campus is adjacent to an area covered by an additional City ordinance: The Northwest Mount Sutro Slope Protection Act. This ordinance was passed in recognition of the particular geologic hazards of development on Mount Sutro.

Here's where it gets real personal. My

requests are based on personal experience. For context, from my driveway, I have a view to the north of the parking lot behind the dental clinics building. You can see Koret Way to the east. Twenty-two years ago, we were in an El Nino year. At about 2:00 a.m. one rainy night in February, 1998, first responders banged on my door and shouted, "Get out. Get out. Get out now."

We were evacuated. A portion of Mount Sutro had fallen into Koret Way at Kirkham Street. UCSF's service vehicles parked in the parking lot below were buried by the slide. If there was an additional land movement, our building was -- would be the next to go. For weeks afterward, mud flowed down Kirkham Street and into the intersection of Fifth and Kirkham. Effectively, it was Franciscan red chert, but it sure looked like mud.

That made -- that night made an impression. It's 22 years later, and I still remember the night clearly. I remember my heart racing and my fear for the safety of my wife and our two small children.

Memory of that night is why, when UCSF commissioned geologist William Haneberg to lead a high-tech, in-depth study of landslide risk at the Parnassus Heights Campus, I studied the report. I

saved it, and I've submitted it for inclusion in the EIR. Unlike most reports which consider earth -- earthquake risks and landslide risks separately, this report looks at the worst case of landslide risk in an earthquake that occurs after heavy rain.

The computer simulations arrived at a result that did not surprise me. Under these conditions, the probabilities of landslides engulfing the campus are so high that this outcome is near certainty. Please consider carefully this within your EIR as you move forward.

One other point. You did not check the box for fire risk. This -- Mount Sutro is considered by the State of California for moderate fire risk. Historically, there have been two fires on Mount Sutro in 1934 and 1990 and 1899. The San Francisco Fire Marshal did an audit in 2015 found that the situation during a drought in -- on Mount Sutro was considered extra hazardous and made some recommendations. Please adhere to those as well. Thank you.

PAM HOFMANN: Pam Hofmann. Your artist's conception of UC Hall shows glass panels on the first floor. The foundation work has been stripped away. In the late 1940s, the famous civil engineer and foundations expert, Henry L. Marchand, was hired to

shore up UC Hall. Since then, we have had not only the Loma Prieta quake, but also the 1957 Daly City quake, which was the largest quake in that location since the 1906 quake.

UC Hall and Marchand's other buildings survived these quakes. UC Hall survived despite that the ground in the area is difficult and has landslide hazards like the rest of the Parnassus campus.

Now, let's look up the street. Ray Booth, an architect who worked on the library, told me they had no idea how it would hold up in an earthquake. The library, Millberry, and Medical Building 1 lean up against the mountain. This means that, in the event of an earthquake, these buildings will be subject to two sets of forces. There will be the vertical and lateral forces on their footing, and at the same time, these buildings would also be subject to different vertical and lateral forces coming from the hill.

Remember that the Northridge quakes demonstrated the risk to parking garages. They pancaked. Garages similar in construction to UCSF's are susceptible. Putting a skin over the parking structures will do nothing. It's lipstick on a pig. Putting more weight on top only increases the risk.

There's also the HSIR Towers in the back that

are nestled in the swale of an old landslide. You're proposing a cut-and-fill roadway, and this is also an increased risk of a landslide.

A lot of the recently built large structure -- structures look beautiful, but they are unsound. Consider the Transbay Terminal, the Bay Bridge, the Oroville Dam spillway, and let's not forget, the Millennium Tower.

UCSF's mission is education, research, and patient care, yet your plans appear to emphasize style and social interaction.

UCSF has labs, containment units and, yes, a morgue. The facility needs to be designed with regard to patient privacy and HIPAA requirements. There need to be containment facilities, and there need to be offices, not cube farms.

UCSF is a hospital, not a convention center. Keep in mind that while some of the patients are not ambulatory, some of the diseases are more than ambulatory. They are airborne.

Finally, please consider the following issues: the difficulty of building on this landslide-prone site; the need to comply with HIPAA requirements; and the need for containment facilities. Thank you.

MICHAEL O'CALLAGHAN: My name's Mike O'Callaghan. I live on Edgewood Avenue, and I started attending these meetings a couple weeks ago for whatever reason, I'm not sure. I think it's something to do with my wife telling me to show up. And I -- I realized what was going on, and I notified some of my friends on Edgewood Avenue which is one of the reasons they're here tonight.

We were a little disturbed, confused, and perplexed as why we're just getting into it now, even though this planning process has been going on for months and years, and we're arguably one of the closest and most impacted neighborhood associations. And we are not listed as stakeholders in this. And that's going to be rectified promptly.

Most of us here don't really understand the process because we haven't been involved in the process long enough. We've just been here for a couple of meetings, myself, and I've heard a lot of conversations about things that were conceptual and they were, you know, this is the -- what the long-range plan is.

And -- and I still don't understand the process, so I'm a little confused. But to make sure that some of my needs are addressed via EIR, I would consider that UC embrace the concept that no

development outside of the existing boundaries of the campus that we're talking about --

UNIDENTIFIED SPEAKER: Yes.

MICHAEL O'CALLAGHAN: -- not crossing over Medical Center Way.

The other big concern I have is that building that new hospital at that corner of the campus -- we're talking about the -- the southwest corner of the campus, I -- I happen to live in a 1905 house that is -- is the closest house to that new construction. And it's all rock there. And that rock has been set to the construction. Vibrations are going to go right through -- into my old house. I don't know what my house is going to look like after the construction.

So I'm very concerned about that, all the noise and -- and ground-borne vibrations -- borne vibrations are going to be an issue.

The other big concern is -- a lot of conversation about it. I know a lot of smart people are looking at the wind. We had some experts here in the room about who -- what -- what the wind's going to do and what the -- how it's going to be affected by this new building. But north of the end of the campus, you're building a large, large structure. The wind's going to funnel through there and expand out that

nozzle right over the top of the hill at Edgewood Avenue.

We have -- you know, right now, the hill works as a great wind block. I'm unsure what this building's going to do. We're interested in finding out. But I know one thing it's going to do is it's going to block out the afternoon sun. You're talking about a very tall building, you know, much taller than what's there. The Langley Porter, it was a, you know, modest structure. And this monolithic structure, as proposed is, you know, a great concern.

We, you know, live in a neighborhood that, you know, gets a lot of morning light. It doesn't get a lot of afternoon light because of the eucalyptus forest and some of the existing structures. But if you're already -- what's proposed here, what we heard about is far beyond anything we have right now, and it will turn the street, you know, very, very dark for months and months a year. And that's disturbing to me. Thank you.

DIANE WONG: The next three speakers are Tes Welborn, Barbara Smith, and Maria Wabl.

TES WELBORN: Hi, I'm Tes Welborn with the Haight Ashbury Neighborhood Council and also a member of the Community Advisory Group. While we appreciate

UCSF's many contributions to the medical field and to patient health and that UCSF has changing needs, increasing the campus size by a million-and-a-half square feet puts an incredible burden and impact on adjacent nearby neighborhoods because we're all connected here in San Francisco; aren't we?

And in the plan so far as it -- it's a plan, there's no provision for providing money for public transportation when in the plan, in the document we've got tonight, traffic would be doubled. It's adding about 4,000 new workers on this campus daily and about 4,000 more faculty, students, and patients.

The plan does not provide workforce housing. Right now, there is housing for some faculty and some students. But with maybe 4,000 additional workers, you know, the -- the Prop E on the ballot in March calls for no more office space in San Francisco without our meeting affordable housing goals. So maybe UC -- UC should try out that shoe, too.

And this plan also, while it's worthy in many ways, follows the huge expansion at Mission Bay which was also a few years ago about a million-and-a-half square feet. Maybe institutions have a certain metastacism (sic) or growth syndrome. At a time when many hospitals are closing and increasingly patients

are being seen at outpatient facilities or even some people talk about being seen at home, a reduction in size of the proposed million-square-foot hospital may be appropriate. Thank you.

BARBARA SMITH: Good evening, everyone. I'm Barbara Smith, a neighbor. I've actually lived in the Inner Sunset for 48 years, at my current residence for 34 years which is just a couple of blocks from the campus. And I found the report to be very hard to follow. It's sketchy. It is, as you said, conceptual and flexible to the point where it's really hard to get a handle on what is being proposed.

And I would suggest a number of changes and amendments to it and then reissuing it and allowing more time to review it. There's not enough information on the plan really, I think, to start off on a full EIR.

There should be more detailed maps indicating the changes between the existing and the proposed site plan really clearly indicating those changes, including the building footprints, open space, parking, and traffic flows within and around the site. Even though they're preliminary and conceptual, I think there could be more detail on those important, really important elements that will impact the surrounding area.

There should be clarifications on the buildings. On the west side, the housing is proposed to be six to ten stories. Ten stories would really overwhelm the area. And while housing is really important and the plan does call for, I think, over 700 additional housing units, which is very important, the population is going to go up by over 7,900 individuals which is really, again, going to impact the surrounding areas with traffic and parking.

I think that there should be tables that really clearly compare what's existing now, what's proposed, and what the additional elements are. Whether it's parking, housing, square footage of the hospital and the other buildings, those should be really clearly laid out so it's very easy for us to see what the changes are.

And also, how will the campus connect to the surrounding neighborhood? There's a lot of talk about what's happening internally in the campus. So I think that internal area, although it will be probably very busy, is great because I think it's -- would be good to have it feel more like a campus and have a lot more interactions within the campus. But also, there should be more focus on how the campus interacts with the rest of the neighborhood.

And thank you. I look forward to -- I hope that you are able to extend the period of time for comment on this and after providing more clarification on what's being proposed. Thank you.

MARIA WABL: My name is Maria Wabl. I live on Fifth Avenue right behind the UCSF campus. I was wondering if we are supporting the corporation here with 6 billion in revenue over the last year. So I'm wondering is -- is that why we need this world-class, huge campus in our neighborhood? That's one thing.

And the other thing is I have to agree with you. It would be great to have tables from the LRDP 2014, what was proposed there and what you are proposing now. And the next thing, one more thing is in the 2014 LRDP, housing on-campus was proposed. There was housing proposed at UC Hall. There was housing proposed in the Millberry Towers. That's all gone.

All of a sudden, we are building housing on Fourth Avenue in the second half of this cycle, more towards the end. And in Aldea, we are adding some, I think, 142 units. I am not sure anymore. And the rest is also happening towards 2050. So we have a housing crisis now, and basically it was proposed that, by 2035, we would have, I don't know, 400 more units

on-campus. And all of a sudden, nothing there. Thank you.

DIANE WONG: The next three speakers; Lisa Kessler, Hans Baldauf, and Maryann Rainey.

LISA KESSLER: Hi everybody. My name's Lisa. I'm a neighbor on Edgewood Avenue. I live on the side adjacent to the new proposed stuff. I'd also like to add I was a medical student here, and I was also someone who worked in research labs, so I feel like I actually worked in the same hub as that.

UNIDENTIFIED SPEAKER: As a junior researcher.

LISA KESSLER: I've been on all sides of this.

UNIDENTIFIED SPEAKER: (Unintelligible)

LISA KESSLER: No, I've been on various --

UNIDENTIFIED SPEAKER: Up to your mouth.

LISA KESSLER: To my mouth. Okay.

So anyways, I'm a neighbor. I was meant to -- I worked in the research lab. I am going to specifically refer to the EIR because I feel like that's why we're here. And we'll have a lot of time to comment on the other stuff.

I just want to say that I got involved in this because I saw the new proposal for the footprint,

and this EIR doesn't refer to that new proposal. It says specifically between Medical Center Way and Moffitt Hospital. So as far as I'm concerned, this proposal in scope is irrelevant. It's a different scope of work entirely. And the new proposed area impacts existing greenland adjacent.

So I'd like to propose some changes to the scope of work that's outlined here since the scope of work is really different.

So under "Aesthetics," you have said no additional analysis required. Substantially damaging scenic resources including but not limited to trees, rock outcroppings, historic buildings, with a distinct scenic highway." There's no scenic highway but there's a lot of -- it's not limited to that, and it is examining different aesthetics. So I'd like to see that addressed.

There's nothing addressing any agriculture or forestry resources. This is an existing forest. And although it's got some non-native eucalyptus, if you actually go back there -- I took a bunch of pictures back there if anyone would like to see them. They started to plant a stead of -- of trees that are originally supposed to be there. And it's beautiful back there.

You're not just act- -- in the existing footprint. If you go over Medical Center Road, you're -- you're addressing all these different -- will result in a loss of forest land or the conversion of forest land to non-forest use. If you say "no additional analysis" required, I think there's additional analysis required because you're taking down trees.

UNIDENTIFIED SPEAKERS: Yes.

LISA KESSLER: ". . .involve other changes in the existing environment which, due to their location or nature, could result in a conversion of non-agricultural use or conversion of forest land to non-forest use."

And the way you address this is to say, hey, we're going to move that forest to another part of the woods and add in some forest.

That's right. That's like saying we're going to take Yosemite, because it's inconvenient, and we're going to move it to Death Valley.

It's unrelated. This -- this is strip of forest next to our homes is important. It buffers the sound. It buffers the -- the smoke or fog or whatever it is that comes out of the back of the hospital. And it's a -- it's an access space for people who come up the Farnsworth Steps, which are historic, and into the

Sutro Forest. It's a really important strip of land. It's small, but it's important. And you're proposing not to study it because it's not in this scope of work.

And so I think this is sort of an irrelevant document. And I think you need to start over.

Yeah, I hear it.

HILLARY GITELMAN: Why don't you wait until the last speaker, and then you can come back up.

LISA KESSLER: Go ahead.

HANS BALDAUF: Hi, Hans Baldauf, 165 Edgewood Avenue. I want to say for the record we do not have enough information. If you're going to be using study plans of other parts that are being developed right now for the hospital, for other housing, we should be having those plans. We should be having all the information that's going to be dumped on your desk now, and we should not be being asked to comment on it until we do have that.

I think that, as I said, we need a -- a -- a study on an option that does not change the historic relationship of the neighborhood to the campus. And I include in that building massing, light, air, the works. I believe -- then, I think we need a complete and thorough study of construction impacts on -- and very detailed from noise, geology, the works.

The entire side of the Surge parking lot collapsed seven or eight years ago due to rain and the water situation and had to be hurriedly reconstructed. The University doesn't have the best record on these topics.

I think that there -- Lisa mentioned the connection of the Farnsworth Steps. A little known fact is that Ishi lived in these buildings. The original university anthropology department was over here. The whole back of the forest has a cultural geography that I don't think you can just mess with without a full thorough historic study of that -- that cultural resource.

And so -- and then this issue of the square footage cap. I -- I really -- I do believe and I -- I think -- I guess -- do we have to hire an attorney to talk with you about this in terms of the binding nature, the idea that somehow this document can be abrogated?

And I think there's a big issue about -- I think there was willingness in the neighborhood to allow for housing, and that that's why the renovation of these buildings was looked upon favorably. I think it can be felt a little bit of a bait and switch to renovate those buildings which could have been the site

of a hospital alternative location and was originally shown in documents from 15 years ago as a hospital site and that now that's been taken off the table because we were generous in our notion of providing housing.

And so I think the notion of sincerely studying alternative hospital sites -- that feels like an uphill battle to me right now, but it feels like on the University should seriously endeavor if they want to gain the goodwill of this community.

MARYANN RAINEY: Hello, I'm Maryann Rainey. I've lived on -- I live on Fourth Avenue. I've lived in this neighborhood for about 45 years. And I do want UCSF to be a -- continue to be a very successful, thriving university and hospital. I've worked in the hospital, and I've been a student at UC.

My concern -- and I -- I think it's appropriate to bring it up now. One of the plans on the first page for project description is discussing candidate buildings for demolition. And the School of Nursing is listed as a building to be demolished right near the Saunders Court. I don't see where it's going to be rebuilt.

And nursing is vital to the operation of the -- the hospital, to the intellectual development of nursing that serves the hospital and the community,

visiting nurses, primary care. So I'm concerned about -- I -- I hope this is an appropriate time to talk about the School of Nursing being rebuilt and where. How does that build go into the plan?

My second point is related to the fact that I live on Fourth Avenue, and I have some idea of the flow of traffic. Well, actually, my concern is related on the back as proposed where the Fourth Avenue extension is happening. That appears to be a sharp turn for trucks to make as they come from Medical Center Way through the extension and down. I'd like to think it would work well, but I have a question. It looks pretty sharp on the map.

Those are my comments.

DIANE WONG: Okay. Next three speakers are Ken Eisen, Sunil Paul, and Denis Mosgofian.

UNIDENTIFIED SPEAKER: Sunil had to leave. Sunil had to leave.

KEN EISEN: Hello, I'm Ken Eisen and my wife and I live on Clarendon Avenue very close to the Aldea student housing. We had a personal experience with sewer backups and antiquated infrastructure of the sewer system running down Clarendon. It's the turn-of-the-century sewer pipe, and it's eight inches -- only eight inches. And it was built before there

was housing brought into the community and never really reflected the amount of increased development that's occurred in the last 30 years.

I think as I understand it, there's plans to expand on Aldea by as much as 500 units, I believe, in the Environmental Impact Report. And that's significant. I'm not sure how many is there now, but it's a significant increase. What are the plans? What are -- what people don't think about that much is sewer infrastructure, things that are under the ground that you don't see visibly besides the landslide issue, which people had touched upon, as you develop areas that are currently forested.

How is that infrastructure going to be provided for it? How is it going to be funded because typically, in private sector development, the cost of infrastructure is funded by the increased assessed values as the area gets developed. So here you have attached it to the community.

In the city of San Francisco, we've had Clarendon torn up for years now. I don't know if you go down Clarendon. There's always roadwork going on because re-sewer -- a lot of ad hoc enhancements on the sewer, the water mains. And all the pipes and everything is right above each other. Makes it very

difficult to work on.

So unless there's a collaboration with the City, which is striving to keep up with this antiquated infrastructure, we -- we see concerns about how that would feed into with the community and potentially impact us.

So that's at least one area on -- because when we -- I do want to say we do appreciate UCSF, the work that it does and the enhancements to the communities. I don't want to totally criticize UCSF. You do things important for the community. So that's one area.

The other -- so that's our main personal focus is how the infrastructure will be provided for. But I mean secondarily, it seems to be that we can't rely on the N Judah to feed into to address the amount of increased activity and density that's going to take place as the level of activity is going to intensify at UCSF.

And my only -- no matter how you slice it, there's going to need -- there are going to be increased vehicles. And hopefully at the same time, Parnassus is going to be closed to vehicular traffic except for buses -- I mean, Uber and ambulances. And I don't want to open up a new can of worms, but the only

area I can think about that might provide for it -- the increased vehicles, will be to build a parking structure by Kezar, near where the McDonalds was is now going to be turned into housing.

And I don't know what kind of a can of worms that would open up, but the only thing I can think about would be to have a parking structure there, people being shuttled into -- into the hospital from -- from that area. At least it would -- it's against the police station. It's not up against too many other people that are interested in opposing it.

So those are the main areas I am personally concerned about. Thank you.

DIANE WONG: Next three speakers, Kevin Siegel, Lori Liederman, and Maury Zeff.

KEVIN SIEGEL: I thought there was somebody else who needed to --

UNIDENTIFIED SPEAKER: I think he left.

UNIDENTIFIED SPEAKER: Is it you?

(Simultaneous speakers; unintelligible)

KEVIN SIEGEL: I'm Kevin Siegel. Okay.

DIANE WONG: I'm sorry.

DENIS MOSGOFIAN: Hi. My name is Denis Mosgofian. I've lived in the Inner Sunset for 45 years. Born in San Francisco and raised in the Haight.

I just have a series of brief things that I think that the EIR has to assess, and I'm not certain that every one of these is at this point in the EIR process, but I'll read them.

I'd like -- like to assess the impact of the -- to the surrounding community of the projected planned increase of at least 4,000 employees, 4,000 patients and faculty and, I expect, over a period of 30 years possibly far greater population increase than that. And it will have, for example, a tremendous impact on local housing. I don't know how that's supposed -- going to be handled, but it will undoubtedly put the kind of pressure on the housing. Unless there's more housing built here, that will cause a lot of competition, and there'll be an increasing cost of housing costs. And that will be both difficult for the folks on the campus as well as for the folks in the community.

I -- I was very concerned about the proposed 40 percent increase in the -- in the ceiling. And so I think that the cumulative impacts of increasing the size of the campus and -- and over the ceiling of about 4 million square feet to a another million and a half should be carefully assessed including, for example, on the transit, on congestion, even though CEQA doesn't

like to talk about congestion. They like to talk about miles traveled.

But the reality is that there will be tremendous congestion here in the same way as, despite MTA's work in the city to clear the streets and -- and allow Uber and Lyft to do what they do, they've actually created a tremendous amount of congestion. So it really hasn't worked. And I'm concerned that, at least at this point, the plans don't appear to be any better than MTA's, at least in my expectation.

I was -- I'm concerned about how patients traveling from a distance -- well, actually, especially acutely sick or pregnant women and so will be able to access their doctors and their care in the plan as described in the general picture so that it's easy for them, not difficult.

And I was wondering how the amount of planned -- housing planned will be sufficient to meet the needs of the quantity of folks and the affordability requirements for the folks that will be here in -- over the coming future.

And I think Tes mentioned, but I'll say it. I'll repeat it, anyway, that I think, given the large scope of the plan, it needs -- the -- the plan -- the EIR needs to assess how much additional funding is

going to be needed for all the additional public services that will absolutely be required to support the campus.

And I had -- I had two thoughts. One is, I felt like a lot of what I heard and what I've read wasn't very clear and I didn't get a very clear picture. And I heard other people say a similar thing. And it occurred to me that this is a stellar and brilliant campus, full of very bright and knowledgeable people. And I cannot believe that such an institution could produce something that isn't very clear. And I think that's kind of odd.

And finally, I think that --

UNIDENTIFIED SPEAKER: Potential.

DENIS MOSGOFIAN: -- there -- there's a rush to judgment. I noticed that there's a proposal that they push this thing to the -- to the Regents by November of this year. I've been around a long time and have been involved in various production, construction projects, and community development projects. Pushing something of this size to the Regents by November says they want to hurry this before people get a -- get a handhold on what's really going on. And I think that's a mistake.

It's a mistake not only for what -- what the

gentleman over here said about a possible lawsuit or a probable lawsuit, but it's also an insult to the whole community. We're all part of this. We're not enemies. And I know at one point when I interacted with the University back when they wanted to take over the Poly [phonetic] site, I was considered an enemy. I wasn't an enemy, I was just a commoner.

But in any case, I think it's important that -- that there not be a rush to judgment and that the time necessary to do this properly and cover the issues that people care about be done properly. And I know that I've heard people here say it brilliantly better than I'm saying it.

Finally, I have one question. And I raised it with the provost, and I'll raise it here. Because I've heard about all of the brilliant medical work that's done here -- and I know, I had a lot of my teeth worked on here when I was a kid when my folks didn't have any money. And it was good work. It lasted all my life.

There's a lot of good work here that's produced and a lot of brilliant, bright people here, very smart. And I -- I asked them. I said do you know, the University, instead of developing anathema, an institution that's like a silo, it should take that

information that they've developed here and share it with the whole Bay Area, the community hospitals and the hospitals in working-class areas, middle-class areas that don't have all of this kind of resource and share it with them so that, one, people can get that medical help and that advice closer to where they live. They don't have to travel so far. And it makes not so many people have to come here for their care just to get such good care.

And I just thought that that's something that, I don't know, it needn't be raised in the EIR but I think it's worth thinking about. Thank you.

KEVIN SIEGEL: Hello. My name is Kevin Siegel. I'm a resident of Eureka Valley on the other side of the hill. I'm a patient here, and I'm a frequent user of the trails. I participate with the Sutro Stewards in the forest on actually constructing the trails, rehabbing the trails. I'm also an advisory board member for Sutro Stewards.

And in my private life, I'm a -- in my work life, I'm a lawyer, land use lawyer representing cities. Actually, I specialize -- one of my specialties is CEQA. And in fact, I've done work with ESA on helping prepare final review documents and helping defend them successfully in court at the time.

I've done that.

So I -- I'm not that familiar with the master plan here or the notice of preparation which a lot of people are complaining about here. But I have some general familiarity. And it's kind of disappointing, actually, because I feel like there's a lot of confusion and misunderstanding about what's going on here.

And I'll just say a little bit about what to basically expect and ask that everybody sort of participate in the process but not prejudge, not say we're going to have a lawsuit because that doesn't actually make any sense at the stage that we're at right now. All this is is a notice of preparation based upon a basic plan that says there's an interest in UCSF in studying.

And it's a different process. And you come up at this stage with a basic diagram about here's conceptually what might happen. You don't make any decisions at this point at all. All this document says that they're going to prepare an EIR. So the initial study and notice of preparation didn't have any decision --

UNIDENTIFIED SPEAKER: But they've come so far, a long way to this point now --

KEVIN SIEGEL: No.

UNIDENTIFIED SPEAKER: -- without any commenting.

KEVIN SIEGEL: Can I finish?

UNIDENTIFIED SPEAKER: Go ahead.

KEVIN SIEGEL: So the -- it doesn't make any decision whether there isn't any environmental impact or whether there is any environmental impact. It says it needs to be studied. And what matters is what's in the Draft EIR. And the point of the scoping session is to provide comments -- which a lot of people have done. There's a lot of good comments here: concerned about traffic; concerned about the impact of forest resources; concerned about safety and utilities and all of that. There was a long list that was put up here.

What matters is paying attention to what's in the EIR. It doesn't make any sense to say let's do a big notice of preparation because that's not going to get you anywhere. All that's going to do is delay, and there's not even any reason for -- for delaying at this point.

So participate, engage in the process, and pay attention to what the Draft Environmental Impact Report says. That report will have the proposed project that UC has -- is preparing. And there'll be

iterations of it. There'll be more details. There'll be maps. There'll be tables. There'll be all sorts of information in there.

And will also have to include a no project alternative, what would happen if they don't do anything. They'll have to include an environmentally superior alternative which is typically, for a development project, scaled down plans. It would be less development in -- up in the hill. There would be less housing. Maybe they won't build it at an -- an Aldea Center or housing, but they would come up with environmentally superior alternatives that will have fewer impacts than the master plan.

And then they will look -- they'll probably -- I don't know how many alternatives are planned, but typically you have at least four. I'm working on a case right now where we have eight. So those get studied. The Draft EIR gets circulated. Comments are made -- at least for a 45-day period. So that is the time to really engage.

And to come in and say, "This isn't going to work. You don't know what you're doing," is partially perhaps from a faulty rollout of explaining what this is about.

UNIDENTIFIED SPEAKER: Well, the history, but

is there --

KEVIN SIEGEL: It's also a lack of -- it's a lack of participation actually in the process and paying attention to what they're doing. So I hope that the -- the ultimate plan, that people participate in it. I'm sure Sutro Stewards, that I'm engaged in, will be looking at it and engaging members for environmental impact. But to -- to prejudge what's happening now is just a mistake.

UNIDENTIFIED SPEAKER: This is a moment we need some of the lawyer. But I know that the map that showed there and the one we just got distributed in the e-mail were different. Something is not --

KEVIN SIEGEL: Because that's what they will -- in the EIR, they will -- Erich, they will look at what the most current method is, and then they'll go --

UNIDENTIFIED SPEAKER: They didn't -- they said they didn't --

KEVIN SIEGEL: All this notice of preparation --

UNIDENTIFIED SPEAKER: -- need to study a bunch of stuff because --

KEVIN SIEGEL: No, that's not what it said.

ALICE MURASAKI: We need an orderly process

to this. If people would like to speak, please fill out a speaker card.

(Simultaneous speakers; unintelligible)

KEVIN SIEGEL: This is a decision -- that is a checklist where you determine whether or not you do an EIR. If you do the EIR, all of the impacts have to be studied based upon what the plan showed.

This does not say anything that is controlling about impacts not being studied. That's not what this is.

UNIDENTIFIED SPEAKER: Next speaker.

UNIDENTIFIED SPEAKER: Now, listen here. He knows what he's talking about. It's worth hearing this information.

KEVIN SIEGEL: All I'm -- I'm not saying you're -- the process is going to be satisfying to you.

UNIDENTIFIED SPEAKER: He knows what he's talking about.

KEVIN SIEGEL: But to prejudge the process now --

DIANE WONG: We need to move on.

(Simultaneous speaker; unintelligible)

DIANE WONG: Can we please be respectful of the time and the speaker. So if you would like to have another turn, simply see Lily, and we can do that. So

please, let's be respectful.

KEVIN SIEGEL: All I'm saying is participate in the process.

DIANE WONG: Okay.

KEVIN SIEGEL: The Stewards will be participating in the process. Pay attention to what happened. Don't decide now.

DIANE WONG: Thank you. The next speaker is Lori Leiderman.

MAURY ZEFF: Hi, Maury Zeff, 119 Edgewood. I'm new to the neighborhood, which, when I moved, means I've been there fewer than 20 years. It makes me extremely new. And I was just planning to come here and sit and listen tonight. But something Hans said, the little known fact, made me realize something I had heard that I want to add to the record tonight.

I'm new to the neighborhood but my friend, Ruth Kirschner [phonetic], who lives on Willard, has been there since 1980. And you mentioned Ishi. So what she told me was Ishi was the last of his tribe in the early 20th century. And UCSF kept him in its buildings for I don't even know -- want to know what purpose is. And apparently, he roamed that trail. And that trail that went about crossing Medical Center Drive, that greenbelt we're talking about is known as

the Ishi Trail.

And Ruth told me that in the 1980s they were still finding Native American arrowheads and artifacts there. So -- I know for reasons not worth going into that other context -- if development were to kind of infringe on Native American land, that's significant because Native Americans, there would have to be all kinds of studies and involvement of different groups. And that may be the case with what's known as the Ishi Trail so I just want to add that.

And while I'm up here, I just want to say you guys are talking about a lot of consideration for the surrounding neighborhoods, you know, not just impacting them but in some cases, it sounds like mitigating impacts that already exist like the Fourth Street corridor, for instance. I guess I just want to say I would ask for the same consideration for your neighbors on Farnsworth and Edgewood. Thanks.

LORI LIEDERMAN: Hi, so, um, I just want to say that -- oh, my name is Lori Liederman. I live on Tenth Avenue, so I live far away from here. And maybe I shouldn't even care what's happening up here, but I do. I just want to comment to the -- not the immediately previous speaker but the -- the person before him.

I've been through a lot of hearings at the Planning Department and some work with Draft EIRs. And I have to agree with Denis Mosgofian that this is a very tight timeline for a DEIR to prepare all the things that various people here have already raised that need to be addressed.

And there is legitimate reason for skepticism and mistrust because this is an incredibly opaque presentation, very difficult to understand, and it's already changed.

And even before it changed with respect to the location of the hospital, it started with an excessive increase in the space ceiling, a violation of a longstanding agreement with the community. So skepticism and distrust has a basis in experience.

So what I want to focus on, though, is that I would like to see a lot of focus in the DEIR of -- on the construction process. We're talking about 30 years of construction. We know -- I live on Tenth Ave. We know how much impact there was from a year and a half to two years of construction around the N Judah changes. Okay? I mean, the impacts of this are going to be enormous. So noise, air quality --

(Simultaneous speakers; unintelligible)

LORI LIEDERMAN: Absolutely. Population.

UNIDENTIFIED SPEAKER: Working, trucks.

LORI LIEDERMAN: All the -- all the people who are going to come in here, all of the construction workers who will be here to work on these projects. And then, of course, the impacts, not just on the neighborhood but on the people who are going to school here and the people who are -- are in the hospital here and the people who are passing here and doing research here.

So those impacts are going to be huge. And the impacts on utilities in this area because presumably, they're all connected somehow. So all of these things needs to be addressed and -- and obviously have to be mitigated.

Very importantly, over the long term, the impact on housing stock. Housing -- housing should not be at the end of this process. Housing needs to come first. We're -- we're looking at legislation in the city to -- to make that happen because the impacts on all of us, on the existing residents of this city, are just too great. And frankly, I know UCSF wants to -- to continue to attract the best and the brightest. And we want that, too.

But you know what? Nobody's going to be able to afford to live here if you guys don't build some

housing. So that's really critical, and it has to be at the front end of this process, not at the back end. I think that's all I have. Thanks.

Oh, I'd like to say this. I heard a commitment about an additional EIR with respect to the hospital. I heard not commitment about additional EIRs with respect to other aspects of this project. I think that that needs to happen because, frankly, the big thing that I don't think anybody has really mentioned is cumulative impacts have to be analyzed. You know, if everybody just does a one-off, then you don't really see the full impact. But the cumulative impacts are going to be enormous.

And I know you're required to look at that. Please look at that in great detail, and we will, too.

DIANE WONG: We have two speakers; Jeff Cole and Mike Grade.

JEFF COLE: Hi, my name's Jeff Cole. I live at 277 Edgewood, which backs up to the UCSF forest near the surg parking lot. Like others who have spoken, I'm a little confused about the process. But I have a request as it relates to the time table because I think the time table that was shown earlier, which we -- ends with presentation to the Regents sometime in 2020 has -- has earlier dates that seem completely unrealistic

to me in light of what we know.

We're here -- well, what we know -- we were told that this is a scoping meeting in connection with a comprehensive Parnassus Heights plan to involve -- to evaluate the environmental impacts of that plan, this document labeled "Final Report, October 2019." I'm sure a lot of work and a lot of time went into this, which shows a map of the proposed site with the new hospital not extending east of Medical Center Way, not encroaching on the hillside, not encroaching on the forest.

And yet, apparently, it's now implied that it's being considered to do all those things, the particulars of which have not been revealed to any of us. Presumably, they'll be revealed to the people doing the environmental impact study. And if that's the case, then I think the time table should be changed to reveal to everybody who might have a comment what the footprint of the new hospital is going to be, what the impact, if any, on the roadway is going to be, on the hillside, on the forest and adjust the time table so that the environmental impact can be studied appropriately with the comments from people who've had an opportunity to see what's being discussed.

I understand that environmental impact

reports can be an iterative process. It's not clear to me that they're contemplating more than one environmental impact study. I guess they're contemplating one with some fluidity about what they're studying the impact of. But I think -- I don't know how you can study the impact of something before you identify what it is.

So I'd request that the -- the deadline for comments be extended from February 14th to some future date and the time table for doing a Draft Environmental Impact report not begin until after the amended plan, whatever it might be, has been published.

UNIDENTIFIED SPEAKER: Thank you.

UNIDENTIFIED SPEAKER: Here, here.

MIKE GRADE: Hi there. I'm Mike Grade. I'm a member of the Sutro Stewards, a longtime volunteer, crew leader, advisory board member. A comment on behalf of Craig -- he's right here.

One of the things for the EIR to consider is the additional movement of -- of folks that live -- the new number of folks that will live up at Aldea through the forest down to the hospital. So just another thing to consider. Thank you.

DIANE WONG: Okay. I have no other cards for new speakers. Has anyone not spoken who would like to

speak?

Would you please state your name, sir?

BRUCE YURIAN [phonetic]: Sure. My name is Bruce Yurian [phonetic]. I'm a bit skeptical of what UC tells me. Maybe I'm wrong, but it -- what I remember is when they built the Mission Bay complex, they said if -- UC said if they were allowed to build there, they wouldn't expand the Parnassus campus any more. So I'm surprised by this, not only the expansion but at one-and-a-half million square foot expansion. That's really all.

UNIDENTIFIED SPEAKER: Can you speak closer to the mic, please?

BRUCE YURIAN [phonetic]: Yes, sorry.

Right now, it seems like this is just -- I'm supposed to think about the approval as a blank check. UC is going to build something somewhere at some time, but I have no idea what that really is. I hope that the young people in the audience are paying attention because I'm going to be dead before we find out if this is the Taj Mahal or a boondoggle.

One thing that I haven't heard addressed or -- I don't know if there's a representative from San Francisco City here? But as UC contemplates all these changes, it seems like the cost to the City is going to

be enormous. That UC said, "We want this. Okay. If you guys at the City can figure out how to redesign the streets, the sewers, and the bus lines and all that."

So I think there's a lot more work needs to be done. And that's all I have to say. Thanks.

DIANE WONG: Is there anyone else who has not yet spoken who would like to make comments?

(No response)

DIANE WONG: Okay. I do have a card from someone who has already spoken. Lisa would like to speak again.

LISA KESSLER: But you know what? I appreciate you listening. This is our chance to get this on the record.

UNIDENTIFIED SPEAKER: Sure.

UNIDENTIFIED SPEAKER: Yes, go ahead.

LISA KESSLER: I almost didn't come.

(Simultaneous speakers; unintelligible)

LISA KESSLER: I already -- you know why.

I already addressed the issues that I saw specifically with the EIR that I want you guys to look at. But I agree -- I was actually going to bring that up about the City, which is I know UCSF wants a bigger hospital and a better campus. I don't know if the City of San Francisco needs another bigger hospital. I want

a study looking at are your hospital beds full, or is this a "If we build it, they will come" mentality? Because there's a brand-new hospital on Van Ness where my husband is right now. There's a brand-new hospital down on Potrero. They've just redone the hospital -- the other one on Mission -- it's escaping me -- that's now Sutter.

(Simultaneous speakers; unintelligible)

LISA KESSLER: St. Luke's. You've got an entire campus, the entire pediatric department and a brand-new children's hospital at Mission Bay. I don't understand why you need a giant campus here. I want to know how you can justify to the City replacing forest land with tertiary care hospital beds.

UNIDENTIFIED SPEAKER: Yes. The city can't even get Van Ness Avenue fixed, let alone --

LISA KESSLER: I just want to know how many hospital beds we need on this tiny little strip of land, how many tertiary -- it's not even a trauma center. So you're not going to get trauma here. You can't. That goes to UCSF. You gave up your hospital at Mt. Zion because you couldn't fill it. Your cancer center's over there. You've got all your pediatrics down in Mission Bay as well as orthopedics. What do you need this giant building for? What are you trying

to accomplish? Who's going to fill it except for workers and more traffic.

So I'd like to see a feasibility study on whether the city needs more tertiary care hospital beds and traffic. But you know, by all means, rebuild Moffitt. Rebuild Long. Have some -- some beds. But this is more about UCSF's ego than it seems to be about what the city needs.

UNIDENTIFIED SPEAKER: Thank you.

BILL DILLON: My name is Bill Dillon and I live on Edgewood Avenue, 240 Edgewood. And I'm also a faculty member here for the last 35 years. I trained here. My wife trained here. So I know kind of both sides of the coin.

Just to follow up on Lisa's point, this place is packed and full. Okay? There are not empty beds. Okay? And there are people waiting to come here, waiting very long times to come here. So it is a incredible resource. I'm not defending this. I'm just telling you that this is an unbelievable resource for our community and through Northern California and -- and beyond, number one.

I do think it's a bit ingenuous -- disingenuous to come to a meeting like this and not be more transparent with the plan that I know is moving

ahead from my own discussions from within UCSF. And I think it's a -- very difficult for community members and people who will be impacted by this construction project not to have a little bit more of a transparent plan at this point.

Now, for the last year and a half, I lived with my wife on Fifth Avenue because we were renovating our house. So I lived both on the west side and I live on the east side of this campus. And I can tell you the project on Parnassus which is going right now was unbelievable for Fifth Avenue residents and, I felt, very, very bad for them. The -- the cars and the trucks start at 4:00 a.m.

UNIDENTIFIED SPEAKER: 3:00, 3:00 a.m.

BILL DILLON: At 3:00 a.m. At least I slept before.

(Simultaneous speakers; unintelligible)

UNIDENTIFIED SPEAKER: And it happens every -- almost every day.

BILL DILLON: Every day. And I even e-mailed Lily and I said, "You know, I'm only here for a year, but this is intolerable." And she put up a teeny little sign -- I think it was on cardboard or something -- saying "No construction trucks should come down Fifth Avenue." That never happens. Okay? It started

at --

UNIDENTIFIED SPEAKER: 3:00, 4:00 a.m.

BILL DILLON: So just imagine for the next 30 years, an iterative process like this, the poor people who live on Fifth and on Sixth and Seventh Avenue, not to mention other interruption.

So I think there should be a study of the impact on traffic and noise and pollution.

UNIDENTIFIED SPEAKER: And sleep.

BILL DILLON: And sleep. Okay? That's fair enough -- and sleep because you can't sleep --

UNIDENTIFIED SPEAKER: Right.

BILL DILLON: -- when they -- when they're coming by. We were -- we had a big problem with that.

Furthermore, the housing that is planned for Fourth Avenue, it sounds like it's going to be quite -- quite tall. And for the people who live on Fifth Avenue, that's -- morning sun, that's all they get. Okay? And that would block sun at least for those people that live on Fifth Avenue. Most of the -- most of the -- that side of Fifth Avenue is owned by UCSF, but the other side would be affected as well.

So not only is it going to affect Edgewood Avenue in terms of light, today, I was walking -- I walk through the forest from -- from work. You all

know that. I walk by your house every day. And I was looking at a beautiful sunset and the Pacific Ocean right in place where this hospital will be built. So I think some consideration has to be paid for not only the -- the views -- I know views aren't, you know, protected here in San Francisco. But it's a real big part of -- of the folks that live on Edgewood Avenue and travel up and down the forest. So thank you very much.

DIANE WONG: Okay. Any other speakers?

(No response)

DIANE WONG: Seeing none, then, we'll close this portion of the meeting.

So next steps are, again, we are looking for written comment as well. So if you'd like to send written comments to the EIR@planning.UCSF.edu then do so.

We are prepared to extend the comment period for the EIR scoping, so we will extend that for one week to February 21st instead of February 14th.

UNIDENTIFIED SPEAKER: Excuse me. Will you be releasing all of the other design work?

HILLARY GITELMAN: We're going to look at the new footprint.

UNIDENTIFIED SPEAKER: Well, not -- it's all

the documents that the woman who's preparing EIR says she will be evaluating.

DIANE WONG: Right. If the plan is on launch --

UNIDENTIFIED SPEAKER: All the different parts? Does that mean -- there were several parts that she referred to having design work having been done on.

HILLARY GITELMAN: The design is in progress. There's --

LISA KESSLER: Can you put the new footprint of the proposed hospital online?

HILLARY GITELMAN: It's all being studied right now.

UNIDENTIFIED SPEAKER: That's not a good strategy. That is not a good strategy.

ALICE MURASAKI: So could we -- is the meeting over or just the discussion or are we --

LISA KESSLER: We're asking a request.

UNIDENTIFIED SPEAKER: I think -- I'm saying this as a request in the recorded meeting.

LISA KESSLER: Yes, we're requesting. In order to be able to do this, we need the new footprint, most recent.

ALICIA MURASAKI: So in the Draft EIR, all of the documents will be available.

LISA KESSLER: But we can't approve going forward to a Draft EIR and if --

(Simultaneous speakers; unintelligible)

ALICE MURASAKI: If you think -- excuse me. Excuse me, please. For those of you who need to leave, thank you for coming this evening. For -- if we can just give Diane 30 seconds of attention so she can finish the important information that we're trying to convey for all of us. And then if we need to have further conversation, we can do that. But could we please let Diane finish the information?

DIANE WONG: So just one last slide. Again, the initial study's available online, and you can give written feedback until February 21st on the EIR scoping. We expect to publish a Draft EIR and the information will be online.

Thank you for coming. And at the conclusion of this meeting, we can talk more about it if you have more requests. Thank you.

(Whereupon, the proceedings concluded at 8:28 p.m.)

STATE OF CALIFORNIA)
) ss.
COUNTY OF SAN FRANCISCO)

CERTIFICATE OF REPORTER

I, JANA OSATO, a duly authorized shorthand reporter, do hereby certify that on the date indicated herein the foregoing proceedings were reported stenographically by me and thereafter transcribed into typewriting by me, a disinterested person, and that this transcript is a true and correct record of said proceedings.

I further certify that I am not of counsel or attorney for either or any of the parties in the foregoing proceeding and caption named, nor in any way interested in the outcome of the cause named in said caption.

Dated the 24th day of February, 2020.

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JANA OSATO

Appendix AIR
Air Quality Appendix

CalEEmod Outputs Construction

CalEEmod Outputs Existing Operation

CalEEmod Outputs Project Operation

UCSF – PCUP Emissions Future Phase

CalEEmod Outputs Construction

UCSF Aldea Housing Initial Phase Construction

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments High Rise	184.00	Dwelling Unit	2.97	184,000.00	526

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2031
Utility Company	City and County of San Francisco				
CO2 Intensity (lb/MWhr)	76.28	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Construction Only Run

Land Use -

Construction Phase -

Off-road Equipment -

Off-road Equipment - Default equipment hours scaled to match extended construction period.

Off-road Equipment - Default equipment hours scaled to match extended construction period

Off-road Equipment - Default equipment hours scaled to match extended construction period

Off-road Equipment - Default equipment hours scaled to match extended construction period.

Off-road Equipment - Default equipment hours scaled to match extended construction period

Trips and VMT -

Demolition -

Grading -

Vehicle Trips - Construction run only

Road Dust -

Woodstoves - Construction run only

Consumer Products - Construction run only

Area Coating - Construction run only

Landscape Equipment - Construction run only

Energy Use - Construction run only

Water And Wastewater - Construction run only

Solid Waste - Construction run only

Construction Off-road Equipment Mitigation - Tier 4 equipment as mitigation

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final

tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
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tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConsumerProducts	ROG_EF	2.14E-05	0
tblEnergyUse	LightingElect	741.44	0.00
tblEnergyUse	NT24E	3,054.10	0.00
tblEnergyUse	NT24NG	2,615.00	0.00
tblEnergyUse	T24E	426.45	0.00
tblEnergyUse	T24NG	6,115.43	0.00
tblFireplaces	NumberGas	27.60	0.00
tblFireplaces	NumberWood	31.28	0.00
tblGrading	MaterialExported	0.00	2,500.00
tblGrading	MaterialExported	0.00	2,500.00
tblSolidWaste	SolidWasteGenerationRate	84.64	0.00
tblTripsAndVMT	HaulingTripNumber	313.00	312.00
tblVehicleTrips	ST_TR	4.98	0.00
tblVehicleTrips	SU_TR	3.65	0.00
tblVehicleTrips	WD_TR	4.20	0.00
tblWater	IndoorWaterUseRate	11,988,340.71	0.00
tblWater	OutdoorWaterUseRate	7,557,866.97	0.00

tblWoodstoves	NumberCatalytic	3.68	0.00
tblWoodstoves	NumberNoncatalytic	3.68	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2028	0.3520	1.7937	2.0844	4.8500e-003	0.1719	0.0621	0.2340	0.0491	0.0591	0.1083	0.0000	430.0915	430.0915	0.0671	0.0000	431.7677
2029	1.1667	5.2600e-003	9.6200e-003	2.0000e-005	9.2000e-004	2.4000e-004	1.1600e-003	2.5000e-004	2.4000e-004	4.8000e-004	0.0000	1.7830	1.7830	7.0000e-005	0.0000	1.7848
Maximum	**1.1667**	**1.7937**	**2.0844**	**4.8500e-003**	**0.1719**	**0.0621**	**0.2340**	**0.0491**	**0.0591**	**0.1083**	**0.0000**	**430.0915**	**430.0915**	**0.0671**	**0.0000**	**431.7677**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2028	0.2068	0.6984	2.2185	4.8500e-003	0.1719	5.6200e-003	0.1775	0.0491	5.5500e-003	0.0547	0.0000	430.0912	430.0912	0.0671	0.0000	431.7674
2029	1.1661	6.9000e-004	9.7200e-003	2.0000e-005	9.2000e-004	2.0000e-005	9.5000e-004	2.5000e-004	2.0000e-005	2.7000e-004	0.0000	1.7830	1.7830	7.0000e-005	0.0000	1.7848
Maximum	**1.1661**	**0.6984**	**2.2185**	**4.8500e-003**	**0.1719**	**5.6200e-003**	**0.1775**	**0.0491**	**5.5500e-003**	**0.0547**	**0.0000**	**430.0912**	**430.0912**	**0.0671**	**0.0000**	**431.7674**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e

Percent Reduction	**9.60**	**61.14**	**-6.41**	**0.00**	**0.00**	**90.95**	**24.11**	**0.00**	**90.62**	**49.49**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-3-2028	4-2-2028	0.5474	0.2023
2	4-3-2028	7-2-2028	0.5041	0.2014
3	7-3-2028	10-2-2028	0.5097	0.2037
4	10-3-2028	1-2-2029	0.9129	0.6325
5	1-3-2029	4-2-2029	0.8372	0.8334
		Highest	0.9129	0.8334

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0408	0.0157	1.3626	7.0000e-005		7.5800e-003	7.5800e-003		7.5800e-003	7.5800e-003	0.0000	2.2317	2.2317	2.1300e-003	0.0000	2.2849
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0408**	**0.0157**	**1.3626**	**7.0000e-005**	**0.0000**	**7.5800e-003**	**7.5800e-003**	**0.0000**	**7.5800e-003**	**7.5800e-003**	**0.0000**	**2.2317**	**2.2317**	**2.1300e-003**	**0.0000**	**2.2849**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Area	0.0408	0.0157	1.3626	7.0000e-005		7.5800e-003	7.5800e-003		7.5800e-003	7.5800e-003	0.0000	2.2317	2.2317	2.1300e-003	0.0000	2.2849
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0408**	**0.0157**	**1.3626**	**7.0000e-005**	**0.0000**	**7.5800e-003**	**7.5800e-003**	**0.0000**	**7.5800e-003**	**7.5800e-003**	**0.0000**	**2.2317**	**2.2317**	**2.1300e-003**	**0.0000**	**2.2849**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/3/2028	1/28/2028	5	20	
2	Site Preparation	Site Preparation	1/29/2028	2/2/2028	5	3	
3	Grading	Grading	2/3/2028	2/10/2028	5	6	
4	Building Construction	Building Construction	2/11/2028	12/14/2028	5	220	
5	Paving	Paving	12/15/2028	12/28/2028	5	10	
6	Architectural Coating	Architectural Coating	12/29/2028	1/11/2029	5	10	

Acres of Grading (Site Preparation Phase): 4.5

Acres of Grading (Grading Phase): 3

Acres of Paving: 0

Residential Indoor: 372,600; Residential Outdoor: 124,200; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation		0		0	
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	108.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	247.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	312.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Building Construction	8	132.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	26.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Demolition - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0127	0.0000	0.0127	1.9200e-003	0.0000	1.9200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0134	0.1291	0.1333	2.4000e-004		5.4500e-003	5.4500e-003		5.0900e-003	5.0900e-003	0.0000	21.0992	21.0992	5.3200e-003	0.0000	21.2323
Total	**0.0134**	**0.1291**	**0.1333**	**2.4000e-004**	**0.0127**	**5.4500e-003**	**0.0182**	**1.9200e-003**	**5.0900e-003**	**7.0100e-003**	**0.0000**	**21.0992**	**21.0992**	**5.3200e-003**	**0.0000**	**21.2323**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.7000e-004	9.7900e-003	6.7200e-003	4.0000e-005	9.1000e-004	2.0000e-005	9.3000e-004	2.5000e-004	2.0000e-005	2.7000e-004	0.0000	4.2430	4.2430	9.2000e-004	0.0000	4.2660
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-004	1.3000e-004	1.7300e-003	1.0000e-005	1.0300e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.7243	0.7243	1.0000e-005	0.0000	0.7245

Total	**5.3000e-004**	**9.9200e-003**	**8.4500e-003**	**5.0000e-005**	**1.9400e-003**	**3.0000e-005**	**1.9600e-003**	**5.2000e-004**	**3.0000e-005**	**5.5000e-004**	**0.0000**	**4.9673**	**4.9673**	**9.3000e-004**	**0.0000**	**4.9906**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0127	0.0000	0.0127	1.9200e-003	0.0000	1.9200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.8100e-003	0.0122	0.1472	2.4000e-004		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	21.0992	21.0992	5.3200e-003	0.0000	21.2323
Total	**2.8100e-003**	**0.0122**	**0.1472**	**2.4000e-004**	**0.0127**	**3.7000e-004**	**0.0131**	**1.9200e-003**	**3.7000e-004**	**2.2900e-003**	**0.0000**	**21.0992**	**21.0992**	**5.3200e-003**	**0.0000**	**21.2323**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.7000e-004	9.7900e-003	6.7200e-003	4.0000e-005	9.1000e-004	2.0000e-005	9.3000e-004	2.5000e-004	2.0000e-005	2.7000e-004	0.0000	4.2430	4.2430	9.2000e-004	0.0000	4.2660
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.6000e-004	1.3000e-004	1.7300e-003	1.0000e-005	1.0300e-003	1.0000e-005	1.0300e-003	2.7000e-004	1.0000e-005	2.8000e-004	0.0000	0.7243	0.7243	1.0000e-005	0.0000	0.7245
Total	**5.3000e-004**	**9.9200e-003**	**8.4500e-003**	**5.0000e-005**	**1.9400e-003**	**3.0000e-005**	**1.9600e-003**	**5.2000e-004**	**3.0000e-005**	**5.5000e-004**	**0.0000**	**4.9673**	**4.9673**	**9.3000e-004**	**0.0000**	**4.9906**

3.3 Site Preparation - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.6500e-003	0.0165	0.0134	4.0000e-005		6.1000e-004	6.1000e-004		5.6000e-004	5.6000e-004	0.0000	3.2287	3.2287	1.0400e-003	0.0000	3.2548
Total	**1.6500e-003**	**0.0165**	**0.0134**	**4.0000e-005**	**2.3900e-003**	**6.1000e-004**	**3.0000e-003**	**2.6000e-004**	**5.6000e-004**	**8.2000e-004**	**0.0000**	**3.2287**	**3.2287**	**1.0400e-003**	**0.0000**	**3.2548**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.3000e-004	0.0224	0.0154	9.0000e-005	2.0700e-003	4.0000e-005	2.1200e-003	5.7000e-004	4.0000e-005	6.1000e-004	0.0000	9.7040	9.7040	2.1000e-003	0.0000	9.7566
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	1.0000e-005	1.6000e-004	0.0000	9.0000e-005	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0669	0.0669	0.0000	0.0000	0.0669
Total	**6.5000e-004**	**0.0224**	**0.0155**	**9.0000e-005**	**2.1600e-003**	**4.0000e-005**	**2.2200e-003**	**6.0000e-004**	**4.0000e-005**	**6.4000e-004**	**0.0000**	**9.7708**	**9.7708**	**2.1000e-003**	**0.0000**	**9.8234**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Fugitive Dust					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.5000e-004	1.9600e-003	0.0178	4.0000e-005		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	3.2287	3.2287	1.0400e-003	0.0000	3.2548
Total	**4.5000e-004**	**1.9600e-003**	**0.0178**	**4.0000e-005**	**2.3900e-003**	**6.0000e-005**	**2.4500e-003**	**2.6000e-004**	**6.0000e-005**	**3.2000e-004**	**0.0000**	**3.2287**	**3.2287**	**1.0400e-003**	**0.0000**	**3.2548**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	6.3000e-004	0.0224	0.0154	9.0000e-005	2.0700e-003	4.0000e-005	2.1200e-003	5.7000e-004	4.0000e-005	6.1000e-004	0.0000	9.7040	9.7040	2.1000e-003	0.0000	9.7566
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	1.0000e-005	1.6000e-004	0.0000	9.0000e-005	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0669	0.0669	0.0000	0.0000	0.0669
Total	**6.5000e-004**	**0.0224**	**0.0155**	**9.0000e-005**	**2.1600e-003**	**4.0000e-005**	**2.2200e-003**	**6.0000e-004**	**4.0000e-005**	**6.4000e-004**	**0.0000**	**9.7708**	**9.7708**	**2.1000e-003**	**0.0000**	**9.8234**

3.4 Grading - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0200	0.0000	0.0200	0.0102	0.0000	0.0102	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.5700e-003	0.0373	0.0255	6.0000e-005		1.4900e-003	1.4900e-003		1.3700e-003	1.3700e-003	0.0000	5.4317	5.4317	1.7600e-003	0.0000	5.4756
Total	**3.5700e-003**	**0.0373**	**0.0255**	**6.0000e-005**	**0.0200**	**1.4900e-003**	**0.0215**	**0.0102**	**1.3700e-003**	**0.0115**	**0.0000**	**5.4317**	**5.4317**	**1.7600e-003**	**0.0000**	**5.4756**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.9000e-004	0.0283	0.0194	1.1000e-004	2.6200e-003	6.0000e-005	2.6700e-003	7.2000e-004	5.0000e-005	7.7000e-004	0.0000	12.2577	12.2577	2.6600e-003	0.0000	12.3241
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	3.0000e-005	4.0000e-004	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1671	0.1671	0.0000	0.0000	0.1672
Total	**8.5000e-004**	**0.0283**	**0.0198**	**1.1000e-004**	**2.8600e-003**	**6.0000e-005**	**2.9100e-003**	**7.8000e-004**	**5.0000e-005**	**8.3000e-004**	**0.0000**	**12.4248**	**12.4248**	**2.6600e-003**	**0.0000**	**12.4913**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0200	0.0000	0.0200	0.0102	0.0000	0.0102	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.6000e-004	3.2800e-003	0.0327	6.0000e-005		1.0000e-004	1.0000e-004		1.0000e-004	1.0000e-004	0.0000	5.4317	5.4317	1.7600e-003	0.0000	5.4756
Total	**7.6000e-004**	**3.2800e-003**	**0.0327**	**6.0000e-005**	**0.0200**	**1.0000e-004**	**0.0201**	**0.0102**	**1.0000e-004**	**0.0103**	**0.0000**	**5.4317**	**5.4317**	**1.7600e-003**	**0.0000**	**5.4756**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	7.9000e-004	0.0283	0.0194	1.1000e-004	2.6200e-003	6.0000e-005	2.6700e-003	7.2000e-004	5.0000e-005	7.7000e-004	0.0000	12.2577	12.2577	2.6600e-003	0.0000	12.3241
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.0000e-005	3.0000e-005	4.0000e-004	0.0000	2.4000e-004	0.0000	2.4000e-004	6.0000e-005	0.0000	6.0000e-005	0.0000	0.1671	0.1671	0.0000	0.0000	0.1672
Total	**8.5000e-004**	**0.0283**	**0.0198**	**1.1000e-004**	**2.8600e-003**	**6.0000e-005**	**2.9100e-003**	**7.8000e-004**	**5.0000e-005**	**8.3000e-004**	**0.0000**	**12.4248**	**12.4248**	**2.6600e-003**	**0.0000**	**12.4913**

3.5 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1639	1.3226	1.5408	2.7500e-003		0.0517	0.0517		0.0495	0.0495	0.0000	228.5088	228.5088	0.0419	0.0000	229.5565
Total	**0.1639**	**1.3226**	**1.5408**	**2.7500e-003**		**0.0517**	**0.0517**		**0.0495**	**0.0495**	**0.0000**	**228.5088**	**228.5088**	**0.0419**	**0.0000**	**229.5565**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.3100e-003	0.1756	0.0741	5.3000e-004	0.0144	2.3000e-004	0.0146	4.1600e-003	2.2000e-004	4.3800e-003	0.0000	55.3913	55.3913	7.7100e-003	0.0000	55.5841
Worker	0.0294	0.0143	0.1931	8.9000e-004	0.1147	7.1000e-004	0.1154	0.0305	6.5000e-004	0.0312	0.0000	80.8944	80.8944	1.1500e-003	0.0000	80.9230

Total	**0.0337**	**0.1899**	**0.2672**	**1.4200e-003**	**0.1291**	**9.4000e-004**	**0.1301**	**0.0347**	**8.7000e-004**	**0.0356**	**0.0000**	**136.2857**	**136.2857**	**8.8600e-003**	**0.0000**	**136.5071**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0363	0.4258	1.6429	2.7500e-003		3.8700e-003	3.8700e-003		3.8700e-003	3.8700e-003	0.0000	228.5086	228.5086	0.0419	0.0000	229.5563
Total	**0.0363**	**0.4258**	**1.6429**	**2.7500e-003**		**3.8700e-003**	**3.8700e-003**		**3.8700e-003**	**3.8700e-003**	**0.0000**	**228.5086**	**228.5086**	**0.0419**	**0.0000**	**229.5563**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.3100e-003	0.1756	0.0741	5.3000e-004	0.0144	2.3000e-004	0.0146	4.1600e-003	2.2000e-004	4.3800e-003	0.0000	55.3913	55.3913	7.7100e-003	0.0000	55.5841
Worker	0.0294	0.0143	0.1931	8.9000e-004	0.1147	7.1000e-004	0.1154	0.0305	6.5000e-004	0.0312	0.0000	80.8944	80.8944	1.1500e-003	0.0000	80.9230
Total	**0.0337**	**0.1899**	**0.2672**	**1.4200e-003**	**0.1291**	**9.4000e-004**	**0.1301**	**0.0347**	**8.7000e-004**	**0.0356**	**0.0000**	**136.2857**	**136.2857**	**8.8600e-003**	**0.0000**	**136.5071**

3.6 Paving - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.9300e-003	0.0372	0.0584	9.0000e-005		1.7500e-003	1.7500e-003		1.6200e-003	1.6200e-003	0.0000	7.7565	7.7565	2.4600e-003	0.0000	7.8179
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.9300e-003**	**0.0372**	**0.0584**	**9.0000e-005**		**1.7500e-003**	**1.7500e-003**		**1.6200e-003**	**1.6200e-003**	**0.0000**	**7.7565**	**7.7565**	**2.4600e-003**	**0.0000**	**7.8179**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	7.0000e-005	1.0000e-003	0.0000	5.9000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.4178	0.4178	1.0000e-005	0.0000	0.4180
Total	**1.5000e-004**	**7.0000e-005**	**1.0000e-003**	**0.0000**	**5.9000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.4178**	**0.4178**	**1.0000e-005**	**0.0000**	**0.4180**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Off-Road	1.0500e-003	4.5600e-003	0.0649	9.0000e-005		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004	0.0000	7.7565	7.7565	2.4600e-003	0.0000	7.8179
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.0500e-003**	**4.5600e-003**	**0.0649**	**9.0000e-005**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**	**0.0000**	**7.7565**	**7.7565**	**2.4600e-003**	**0.0000**	**7.8179**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5000e-004	7.0000e-005	1.0000e-003	0.0000	5.9000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.4178	0.4178	1.0000e-005	0.0000	0.4180
Total	**1.5000e-004**	**7.0000e-005**	**1.0000e-003**	**0.0000**	**5.9000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.4178**	**0.4178**	**1.0000e-005**	**0.0000**	**0.4180**

3.7 Architectural Coating - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1295					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.0000e-005	5.7000e-004	9.0000e-004	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.1277	0.1277	1.0000e-005	0.0000	0.1278
Total	**0.1296**	**5.7000e-004**	**9.0000e-004**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.1277**	**0.1277**	**1.0000e-005**	**0.0000**	**0.1278**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	1.0000e-005	1.7000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0724	0.0724	0.0000	0.0000	0.0725
Total	**3.0000e-005**	**1.0000e-005**	**1.7000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0724**	**0.0724**	**0.0000**	**0.0000**	**0.0725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.1295					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0000e-005	6.0000e-005	9.2000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.1277	0.1277	1.0000e-005	0.0000	0.1278
Total	**0.1295**	**6.0000e-005**	**9.2000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.1277**	**0.1277**	**1.0000e-005**	**0.0000**	**0.1278**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.0000e-005	1.0000e-005	1.7000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0724	0.0724	0.0000	0.0000	0.0725
Total	**3.0000e-005**	**1.0000e-005**	**1.7000e-004**	**0.0000**	**1.0000e-004**	**0.0000**	**1.0000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0724**	**0.0724**	**0.0000**	**0.0000**	**0.0725**

3.7 Architectural Coating - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1657					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.7000e-004	5.1500e-003	8.1400e-003	1.0000e-005		2.3000e-004	2.3000e-004		2.3000e-004	2.3000e-004	0.0000	1.1490	1.1490	6.0000e-005	0.0000	1.1505
Total	**1.1665**	**5.1500e-003**	**8.1400e-003**	**1.0000e-005**		**2.3000e-004**	**2.3000e-004**		**2.3000e-004**	**2.3000e-004**	**0.0000**	**1.1490**	**1.1490**	**6.0000e-005**	**0.0000**	**1.1505**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.1000e-004	1.4800e-003	1.0000e-005	9.2000e-004	1.0000e-005	9.3000e-004	2.5000e-004	0.0000	2.5000e-004	0.0000	0.6341	0.6341	1.0000e-005	0.0000	0.6343

Total	**2.3000e-004**	**1.1000e-004**	**1.4800e-003**	**1.0000e-005**	**9.2000e-004**	**1.0000e-005**	**9.3000e-004**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**0.0000**	**0.6341**	**0.6341**	**1.0000e-005**	**0.0000**	**0.6343**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.1657					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3000e-004	5.8000e-004	8.2500e-003	1.0000e-005		2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005	0.0000	1.1490	1.1490	6.0000e-005	0.0000	1.1505
Total	**1.1659**	**5.8000e-004**	**8.2500e-003**	**1.0000e-005**		**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**	**0.0000**	**1.1490**	**1.1490**	**6.0000e-005**	**0.0000**	**1.1505**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.1000e-004	1.4800e-003	1.0000e-005	9.2000e-004	1.0000e-005	9.3000e-004	2.5000e-004	0.0000	2.5000e-004	0.0000	0.6341	0.6341	1.0000e-005	0.0000	0.6343
Total	**2.3000e-004**	**1.1000e-004**	**1.4800e-003**	**1.0000e-005**	**9.2000e-004**	**1.0000e-005**	**9.3000e-004**	**2.5000e-004**	**0.0000**	**2.5000e-004**	**0.0000**	**0.6341**	**0.6341**	**1.0000e-005**	**0.0000**	**0.6343**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments High Rise	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments High Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments High Rise	0.601973	0.036168	0.193150	0.092307	0.012222	0.005292	0.035273	0.009746	0.004298	0.002300	0.005708	0.000958	0.000606

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments High Rise	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments High Rise	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0408	0.0157	1.3626	7.0000e-005		7.5800e-003	7.5800e-003		7.5800e-003	7.5800e-003	0.0000	2.2317	2.2317	2.1300e-003	0.0000	2.2849
Unmitigated	0.0408	0.0157	1.3626	7.0000e-005		7.5800e-003	7.5800e-003		7.5800e-003	7.5800e-003	0.0000	2.2317	2.2317	2.1300e-003	0.0000	2.2849

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0408	0.0157	1.3626	7.0000e-005		7.5800e-003	7.5800e-003		7.5800e-003	7.5800e-003	0.0000	2.2317	2.2317	2.1300e-003	0.0000	2.2849

Total	**0.0408**	**0.0157**	**1.3626**	**7.0000e-005**		**7.5800e-003**	**7.5800e-003**		**7.5800e-003**	**7.5800e-003**	**0.0000**	**2.2317**	**2.2317**	**2.1300e-003**	**0.0000**	**2.2849**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0408	0.0157	1.3626	7.0000e-005		7.5800e-003	7.5800e-003		7.5800e-003	7.5800e-003	0.0000	2.2317	2.2317	2.1300e-003	0.0000	2.2849
Total	**0.0408**	**0.0157**	**1.3626**	**7.0000e-005**		**7.5800e-003**	**7.5800e-003**		**7.5800e-003**	**7.5800e-003**	**0.0000**	**2.2317**	**2.2317**	**2.1300e-003**	**0.0000**	**2.2849**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	0	0.0000	0.0000	0.0000	0.0000

Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

New Hospital Construction - San Francisco County, Annual

New Hospital Construction

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Hospital	955.00	1000sqft	2.00	955,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2031
Utility Company	City and County of San Francisco				
CO2 Intensity (lb/MWhr)	76.28	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - UCSF is its own electricity provider

Land Use - Acreage per applicants RFI response.

Construction Phase - Construction Schedule per applicants RFI response. LPPI Demo in 2014 LRDP

Off-road Equipment - For trenching equipment use URBEMS default as CalEEMod has no assumption.

Trips and VMT -

Grading - Project site is two acres

Vehicle Trips - Construction Run Only

Consumer Products - Construction Run Only

Area Coating - Construction Run Only

Landscape Equipment - Construction Run Only

Energy Use - Construction Run Only

Water And Wastewater - Construction Run Only

Solid Waste - Construction Run Only

Construction Off-road Equipment Mitigation - Tier 4 equipment as mitigation

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	10.00	521.00

tblConstructionPhase	NumDays	200.00	522.00
tblConstructionPhase	NumDays	200.00	1,043.00
tblConstructionPhase	NumDays	4.00	152.00
tblConstructionPhase	NumDays	2.00	152.00
tblConsumerProducts	ROG_EF	2.14E-05	0
tblEnergyUse	LightingElect	4.23	0.00
tblEnergyUse	NT24E	5.52	0.00
tblEnergyUse	NT24NG	15.80	0.00
tblEnergyUse	T24E	6.47	0.00
tblEnergyUse	T24NG	84.89	0.00
tblGrading	AcresOfGrading	76.00	2.00
tblGrading	AcresOfGrading	228.00	3.00
tblGrading	MaterialExported	0.00	170,385.00
tblLandUse	LotAcreage	21.92	2.00
tblSolidWaste	SolidWasteGenerationRate	10,314.00	0.00
tblVehicleTrips	ST_TR	10.18	0.00
tblVehicleTrips	SU_TR	8.91	0.00
tblVehicleTrips	WD_TR	13.22	0.00
tblWater	IndoorWaterUseRate	119,833,913.37	0.00
tblWater	OutdoorWaterUseRate	22,825,507.31	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					

2024	0.2932	4.2909	3.1774	0.0111	0.6185	0.1064	0.7249	0.2951	0.0981	0.3932	0.0000	1,114.1701	1,114.17	0.2699	0.0000	1,120.92
2025	0.3301	3.3730	3.1337	0.0111	0.4495	0.0660	0.5155	0.1227	0.0631	0.1858	0.0000	1,046.5361	1,046.54	0.1253	0.0000	1,049.6677
2026	0.6503	6.6532	6.2030	0.0218	0.8989	0.1317	1.0307	0.2453	0.1259	0.3712	0.0000	2,065.5642	2,065.56	0.2500	0.0000	2,071.8144
2027	0.3203	3.2825	3.0733	0.0107	0.4495	0.0657	0.5151	0.1227	0.0628	0.1854	0.0000	1,020.3680	1,020.37	0.1248	0.0000	1,023.4883
2028	2.8376	3.3881	3.3782	0.0115	0.5104	0.0722	0.5827	0.1389	0.0693	0.2082	0.0000	1,082.9324	1,082.93	0.1266	0.0000	1,086.0979
2029	2.8428	3.3630	3.3622	0.0114	0.5124	0.0723	0.5846	0.1394	0.0694	0.2088	0.0000	1,076.0456	1,076.05	0.1270	0.0000	1,079.2207
Maximum	**2.8428**	**6.6532**	**6.2030**	**0.0218**	**0.8989**	**0.1317**	**1.0307**	**0.2951**	**0.1259**	**0.3932**	**0.0000**	**2,065.5642**	**2,065.5642**	**0.2699**	**0.0000**	**2,071.8144**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2024	0.0477	1.3746	3.6963	0.0111	0.6185	-0.0205	0.5980	0.2951	-0.0179	0.2772	0.0000	1,114.1696	1,114.1696	0.2699	0.0000	1,120.9175
2025	0.1741	2.2518	3.2603	0.0111	0.4495	6.9000e-003	0.4564	0.1227	6.8200e-003	0.1295	0.0000	1,046.5358	1,046.5358	0.1253	0.0000	1,049.6674
2026	0.3383	4.4107	6.4563	0.0218	0.8989	0.0135	0.9124	0.2453	0.0133	0.2586	0.0000	2,065.5635	2,065.5635	0.2500	0.0000	2,071.8137
2027	0.1643	2.1613	3.1999	0.0107	0.4495	6.5200e-003	0.4560	0.1227	6.4600e-003	0.1291	0.0000	1,020.3677	1,020.3677	0.1248	0.0000	1,023.4880
2028	2.6639	2.1390	3.5074	0.0115	0.5104	7.1500e-003	0.5176	0.1389	7.0800e-003	0.1459	0.0000	1,082.9320	1,082.9320	0.1266	0.0000	1,086.0976
2029	2.6684	2.1091	3.4919	0.0114	0.5124	6.9200e-003	0.5193	0.1394	6.8700e-003	0.1463	0.0000	1,076.0452	1,076.0452	0.1270	0.0000	1,079.2203
Maximum	**2.6684**	**4.4107**	**6.4563**	**0.0218**	**0.8989**	**0.0135**	**0.9124**	**0.2951**	**0.0133**	**0.2772**	**0.0000**	**2,065.5635**	**2,065.5635**	**0.2699**	**0.0000**	**2,071.8137**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**16.74**	**40.67**	**-5.75**	**0.00**	**0.00**	**96.02**	**12.49**	**0.00**	**95.37**	**30.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
5	6-1-2024	8-31-2024	1.9653	0.5983
6	9-1-2024	11-30-2024	1.9563	0.6042
7	12-1-2024	2-28-2025	1.2683	0.6015
8	3-1-2025	5-31-2025	0.9291	0.6075
9	6-1-2025	8-31-2025	0.9260	0.6044
10	9-1-2025	11-30-2025	0.9221	0.6040
11	12-1-2025	2-28-2026	1.4981	0.9773
12	3-1-2026	5-31-2026	1.8326	1.1895
13	6-1-2026	8-31-2026	1.8266	1.1834
14	9-1-2026	11-30-2026	1.8187	1.1825
15	12-1-2026	2-28-2027	1.2051	0.7821
16	3-1-2027	5-31-2027	0.9041	0.5826
17	6-1-2027	8-31-2027	0.9012	0.5796
18	9-1-2027	11-30-2027	0.8972	0.5791
19	12-1-2027	2-29-2028	1.3351	0.9922
20	3-1-2028	5-31-2028	1.5707	1.2111
21	6-1-2028	8-31-2028	1.5675	1.2079
22	9-1-2028	11-30-2028	1.5568	1.2010
23	12-1-2028	2-28-2029	1.5355	1.1837
24	3-1-2029	5-31-2029	1.5597	1.2001
25	6-1-2029	8-31-2029	1.5566	1.1970
26	9-1-2029	9-30-2029	0.5076	0.3903
		Highest	1.9653	1.2111

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Area	8.0000e-004	8.0000e-005	8.7300e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0171	0.0171	4.0000e-005	0.0000	0.0182
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.0000e-004**	**8.0000e-005**	**8.7300e-003**	**0.0000**	**0.0000**	**3.0000e-005**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0171**	**0.0171**	**4.0000e-005**	**0.0000**	**0.0182**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	8.0000e-004	8.0000e-005	8.7300e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0171	0.0171	4.0000e-005	0.0000	0.0182
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.0000e-004**	**8.0000e-005**	**8.7300e-003**	**0.0000**	**0.0000**	**3.0000e-005**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0171**	**0.0171**	**4.0000e-005**	**0.0000**	**0.0182**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/1/2024	12/31/2024	5	152	
2	Grading	Grading	6/1/2024	12/31/2024	5	152	
3	Drainage/Utilities/Subgrade	Trenching	6/1/2024	12/31/2024	5	152	
4	Foundations/Concrete Pour	Building Construction	1/1/2025	12/31/2026	5	522	
5	Building Construction	Building Construction	1/1/2026	12/31/2029	5	1043	
6	Architectural Coating	Architectural Coating	1/1/2028	12/31/2029	5	521	

Acres of Grading (Site Preparation Phase): 3

Acres of Grading (Grading Phase): 2

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,432,500; Non-Residential Outdoor: 477,500; Striped Parking

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48
Drainage/Utilities/Subgrade	Excavators	2	8.00	158	0.38

Drainage/Utilities/Subgrade	Other General Industrial Equipment	1	8.00	88	0.34
Drainage/Utilities/Subgrade	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Foundations/Concrete Pour	Cranes	1	8.00	231	0.29
Foundations/Concrete Pour	Forklifts	2	7.00	89	0.20
Foundations/Concrete Pour	Generator Sets	1	8.00	84	0.74
Foundations/Concrete Pour	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Foundations/Concrete Pour	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	16,847.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	306.00	157.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	61.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Drainage/Utilities/Subgrade	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Foundations/Concrete Pour	8	306.00	157.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Site Preparation - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.5900e-003	0.0000	1.5900e-003	1.7000e-004	0.0000	1.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.0943	0.9970	0.7281	1.8600e-003		0.0378	0.0378		0.0348	0.0348	0.0000	163.6539	163.6539	0.0529	0.0000	164.9771
Total	**0.0943**	**0.9970**	**0.7281**	**1.8600e-003**	**1.5900e-003**	**0.0378**	**0.0394**	**1.7000e-004**	**0.0348**	**0.0349**	**0.0000**	**163.6539**	**163.6539**	**0.0529**	**0.0000**	**164.9771**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4700e-003	8.2000e-004	0.0103	4.0000e-005	4.8000e-003	3.0000e-005	4.8400e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	3.9135	3.9135	7.0000e-005	0.0000	3.9152
Total	**1.4700e-003**	**8.2000e-004**	**0.0103**	**4.0000e-005**	**4.8000e-003**	**3.0000e-005**	**4.8400e-003**	**1.2800e-003**	**3.0000e-005**	**1.3100e-003**	**0.0000**	**3.9135**	**3.9135**	**7.0000e-005**	**0.0000**	**3.9152**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.5900e-003	0.0000	1.5900e-003	1.7000e-004	0.0000	1.7000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0193	0.0564	0.9049	1.8600e-003		1.0100e-003	1.0100e-003		1.1800e-003	1.1800e-003	0.0000	163.6537	163.6537	0.0529	0.0000	164.9769
Total	**0.0193**	**0.0564**	**0.9049**	**1.8600e-003**	**1.5900e-003**	**1.0100e-003**	**2.6000e-003**	**1.7000e-004**	**1.1800e-003**	**1.3500e-003**	**0.0000**	**163.6537**	**163.6537**	**0.0529**	**0.0000**	**164.9769**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4700e-003	8.2000e-004	0.0103	4.0000e-005	4.8000e-003	3.0000e-005	4.8400e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	3.9135	3.9135	7.0000e-005	0.0000	3.9152
Total	**1.4700e-003**	**8.2000e-004**	**0.0103**	**4.0000e-005**	**4.8000e-003**	**3.0000e-005**	**4.8400e-003**	**1.2800e-003**	**3.0000e-005**	**1.3100e-003**	**0.0000**	**3.9135**	**3.9135**	**7.0000e-005**	**0.0000**	**3.9152**

3.3 Grading - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4587	0.0000	0.4587	0.2517	0.0000	0.2517	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0989	1.0502	0.6612	1.5700e-003		0.0435	0.0435		0.0400	0.0400	0.0000	137.5874	137.5874	0.0445	0.0000	138.6998
Total	**0.0989**	**1.0502**	**0.6612**	**1.5700e-003**	**0.4587**	**0.0435**	**0.5022**	**0.2517**	**0.0400**	**0.2917**	**0.0000**	**137.5874**	**137.5874**	**0.0445**	**0.0000**	**138.6998**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0450	1.8089	0.9400	6.3000e-003	0.1413	3.6300e-003	0.1449	0.0388	3.4700e-003	0.0423	0.0000	692.3435	692.3435	0.1377	0.0000	695.7857
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8400e-003	1.0300e-003	0.0129	5.0000e-005	6.0100e-003	4.0000e-005	6.0500e-003	1.6000e-003	4.0000e-005	1.6400e-003	0.0000	4.8919	4.8919	8.0000e-005	0.0000	4.8940
Total	**0.0469**	**1.8100**	**0.9528**	**6.3500e-003**	**0.1473**	**3.6700e-003**	**0.1510**	**0.0404**	**3.5100e-003**	**0.0439**	**0.0000**	**697.2354**	**697.2354**	**0.1378**	**0.0000**	**700.6796**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4587	0.0000	0.4587	0.2517	0.0000	0.2517	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	-0.0328	-0.5096	0.8894	1.5700e-003		-0.0249	-0.0249		-0.0226	-0.0226	0.0000	137.5872	137.5872	0.0445	0.0000	138.6997
Total	**-0.0328**	**-0.5096**	**0.8894**	**1.5700e-003**	**0.4587**	**-0.0249**	**0.4339**	**0.2517**	**-0.0226**	**0.2291**	**0.0000**	**137.5872**	**137.5872**	**0.0445**	**0.0000**	**138.6997**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0450	1.8089	0.9400	6.3000e-003	0.1413	3.6300e-003	0.1449	0.0388	3.4700e-003	0.0423	0.0000	692.3435	692.3435	0.1377	0.0000	695.7857
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8400e-003	1.0300e-003	0.0129	5.0000e-005	6.0100e-003	4.0000e-005	6.0500e-003	1.6000e-003	4.0000e-005	1.6400e-003	0.0000	4.8919	4.8919	8.0000e-005	0.0000	4.8940
Total	**0.0469**	**1.8100**	**0.9528**	**6.3500e-003**	**0.1473**	**3.6700e-003**	**0.1510**	**0.0404**	**3.5100e-003**	**0.0439**	**0.0000**	**697.2354**	**697.2354**	**0.1378**	**0.0000**	**700.6796**

3.4 Drainage/Utilities/Subgrade - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0499	0.4319	0.8122	1.2200e-003		0.0214	0.0214		0.0197	0.0197	0.0000	106.8881	106.8881	0.0346	0.0000	107.7524
Total	**0.0499**	**0.4319**	**0.8122**	**1.2200e-003**		**0.0214**	**0.0214**		**0.0197**	**0.0197**	**0.0000**	**106.8881**	**106.8881**	**0.0346**	**0.0000**	**107.7524**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8400e-003	1.0300e-003	0.0129	5.0000e-005	6.0100e-003	4.0000e-005	6.0500e-003	1.6000e-003	4.0000e-005	1.6400e-003	0.0000	4.8919	4.8919	8.0000e-005	0.0000	4.8940
Total	**1.8400e-003**	**1.0300e-003**	**0.0129**	**5.0000e-005**	**6.0100e-003**	**4.0000e-005**	**6.0500e-003**	**1.6000e-003**	**4.0000e-005**	**1.6400e-003**	**0.0000**	**4.8919**	**4.8919**	**8.0000e-005**	**0.0000**	**4.8940**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0109	0.0160	0.9260	1.2200e-003		-0.0003	-0.0003		-0.0001	-0.0001	0.0000	106.8880	106.8880	0.0346	0.0000	107.7522
Total	**0.0109**	**0.0160**	**0.9260**	**1.2200e-003**		**-0.0003**	**-0.0003**		**-0.0001**	**-0.0001**	**0.0000**	**106.8880**	**106.8880**	**0.0346**	**0.0000**	**107.7522**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.8400e-003	1.0300e-003	0.0129	5.0000e-005	6.0100e-003	4.0000e-005	6.0500e-003	1.6000e-003	4.0000e-005	1.6400e-003	0.0000	4.8919	4.8919	8.0000e-005	0.0000	4.8940
Total	**1.8400e-003**	**1.0300e-003**	**0.0129**	**5.0000e-005**	**6.0100e-003**	**4.0000e-005**	**6.0500e-003**	**1.6000e-003**	**4.0000e-005**	**1.6400e-003**	**0.0000**	**4.8919**	**4.8919**	**8.0000e-005**	**0.0000**	**4.8940**

3.5 Foundations/Concrete Pour - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1944	1.5690	1.8279	3.2700e-003		0.0613	0.0613		0.0587	0.0587	0.0000	271.0946	271.0946	0.0497	0.0000	272.3375

Total	**0.1944**	**1.5690**	**1.8279**	**3.2700e-003**		**0.0613**	**0.0613**		**0.0587**	**0.0587**	**0.0000**	**271.0946**	**271.0946**	**0.0497**	**0.0000**	**272.3375**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0436	1.7544	0.6732	5.0700e-003	0.1339	2.4300e-003	0.1364	0.0387	2.3300e-003	0.0410	0.0000	528.9201	528.9201	0.0715	0.0000	530.7080
Worker	0.0922	0.0495	0.6326	2.7200e-003	0.3155	2.2800e-003	0.3178	0.0839	2.1000e-003	0.0860	0.0000	246.5214	246.5214	4.0300e-003	0.0000	246.6222
Total	**0.1357**	**1.8039**	**1.3057**	**7.7900e-003**	**0.4495**	**4.7100e-003**	**0.4542**	**0.1227**	**4.4300e-003**	**0.1271**	**0.0000**	**775.4415**	**775.4415**	**0.0755**	**0.0000**	**777.3302**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0384	0.4478	1.9546	3.2700e-003		2.1900e-003	2.1900e-003		2.4000e-003	2.4000e-003	0.0000	271.0943	271.0943	0.0497	0.0000	272.3372
Total	**0.0384**	**0.4478**	**1.9546**	**3.2700e-003**		**2.1900e-003**	**2.1900e-003**		**2.4000e-003**	**2.4000e-003**	**0.0000**	**271.0943**	**271.0943**	**0.0497**	**0.0000**	**272.3372**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0436	1.7544	0.6732	5.0700e-003	0.1339	2.4300e-003	0.1364	0.0387	2.3300e-003	0.0410	0.0000	528.9201	528.9201	0.0715	0.0000	530.7080
Worker	0.0922	0.0495	0.6326	2.7200e-003	0.3155	2.2800e-003	0.3178	0.0839	2.1000e-003	0.0860	0.0000	246.5214	246.5214	4.0300e-003	0.0000	246.6222
Total	**0.1357**	**1.8039**	**1.3057**	**7.7900e-003**	**0.4495**	**4.7100e-003**	**0.4542**	**0.1227**	**4.4300e-003**	**0.1271**	**0.0000**	**775.4415**	**775.4415**	**0.0755**	**0.0000**	**777.3302**

3.5 Foundations/Concrete Pour - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1944	1.5690	1.8279	3.2700e-003		0.0613	0.0613		0.0587	0.0587	0.0000	271.0946	271.0946	0.0497	0.0000	272.3375
Total	**0.1944**	**1.5690**	**1.8279**	**3.2700e-003**		**0.0613**	**0.0613**		**0.0587**	**0.0587**	**0.0000**	**271.0946**	**271.0946**	**0.0497**	**0.0000**	**272.3375**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0423	1.7119	0.6792	5.0000e-003	0.1339	2.3200e-003	0.1362	0.0387	2.2200e-003	0.0409	0.0000	524.2767	524.2767	0.0716	0.0000	526.0664
Worker	0.0884	0.0456	0.5944	2.6200e-003	0.3155	2.2200e-003	0.3178	0.0839	2.0400e-003	0.0860	0.0000	237.4108	237.4108	3.7000e-003	0.0000	237.5033
Total	**0.1307**	**1.7575**	**1.2736**	**7.6200e-003**	**0.4495**	**4.5400e-003**	**0.4540**	**0.1227**	**4.2600e-003**	**0.1269**	**0.0000**	**761.6875**	**761.6875**	**0.0753**	**0.0000**	**763.5697**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0384	0.4478	1.9546	3.2700e-003		2.1900e-003	2.1900e-003		2.4000e-003	2.4000e-003	0.0000	271.0943	271.0943	0.0497	0.0000	272.3372
Total	**0.0384**	**0.4478**	**1.9546**	**3.2700e-003**		**2.1900e-003**	**2.1900e-003**		**2.4000e-003**	**2.4000e-003**	**0.0000**	**271.0943**	**271.0943**	**0.0497**	**0.0000**	**272.3372**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0423	1.7119	0.6792	5.0000e-003	0.1339	2.3200e-003	0.1362	0.0387	2.2200e-003	0.0409	0.0000	524.2767	524.2767	0.0716	0.0000	526.0664
Worker	0.0884	0.0456	0.5944	2.6200e-003	0.3155	2.2200e-003	0.3178	0.0839	2.0400e-003	0.0860	0.0000	237.4108	237.4108	3.7000e-003	0.0000	237.5033
Total	**0.1307**	**1.7575**	**1.2736**	**7.6200e-003**	**0.4495**	**4.5400e-003**	**0.4540**	**0.1227**	**4.2600e-003**	**0.1269**	**0.0000**	**761.6875**	**761.6875**	**0.0753**	**0.0000**	**763.5697**

3.6 Building Construction - 2026

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1944	1.5690	1.8279	3.2700e-003		0.0613	0.0613		0.0587	0.0587	0.0000	271.0946	271.0946	0.0497	0.0000	272.3375
Total	**0.1944**	**1.5690**	**1.8279**	**3.2700e-003**		**0.0613**	**0.0613**		**0.0587**	**0.0587**	**0.0000**	**271.0946**	**271.0946**	**0.0497**	**0.0000**	**272.3375**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0423	1.7119	0.6792	5.0000e-003	0.1339	2.3200e-003	0.1362	0.0387	2.2200e-003	0.0409	0.0000	524.2767	524.2767	0.0716	0.0000	526.0664
Worker	0.0884	0.0456	0.5944	2.6200e-003	0.3155	2.2200e-003	0.3178	0.0839	2.0400e-003	0.0860	0.0000	237.4108	237.4108	3.7000e-003	0.0000	237.5033
Total	**0.1307**	**1.7575**	**1.2736**	**7.6200e-003**	**0.4495**	**4.5400e-003**	**0.4540**	**0.1227**	**4.2600e-003**	**0.1269**	**0.0000**	**761.6875**	**761.6875**	**0.0753**	**0.0000**	**763.5697**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0384	0.4478	1.9546	3.2700e-003		2.1900e-003	2.1900e-003		2.4000e-003	2.4000e-003	0.0000	271.0943	271.0943	0.0497	0.0000	272.3372
Total	**0.0384**	**0.4478**	**1.9546**	**3.2700e-003**		**2.1900e-003**	**2.1900e-003**		**2.4000e-003**	**2.4000e-003**	**0.0000**	**271.0943**	**271.0943**	**0.0497**	**0.0000**	**272.3372**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0423	1.7119	0.6792	5.0000e-003	0.1339	2.3200e-003	0.1362	0.0387	2.2200e-003	0.0409	0.0000	524.2767	524.2767	0.0716	0.0000	526.0664
Worker	0.0884	0.0456	0.5944	2.6200e-003	0.3155	2.2200e-003	0.3178	0.0839	2.0400e-003	0.0860	0.0000	237.4108	237.4108	3.7000e-003	0.0000	237.5033
Total	**0.1307**	**1.7575**	**1.2736**	**7.6200e-003**	**0.4495**	**4.5400e-003**	**0.4540**	**0.1227**	**4.2600e-003**	**0.1269**	**0.0000**	**761.6875**	**761.6875**	**0.0753**	**0.0000**	**763.5697**

3.6 Building Construction - 2027

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1944	1.5690	1.8279	3.2700e-003		0.0613	0.0613		0.0587	0.0587	0.0000	271.0946	271.0946	0.0497	0.0000	272.3375

Total	**0.1944**	**1.5690**	**1.8279**	**3.2700e-003**		**0.0613**	**0.0613**		**0.0587**	**0.0587**	**0.0000**	**271.0946**	**271.0946**	**0.0497**	**0.0000**	**272.3375**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0412	1.6713	0.6846	4.9400e-003	0.1339	2.2200e-003	0.1361	0.0387	2.1200e-003	0.0408	0.0000	519.8406	519.8406	0.0717	0.0000	521.6327
Worker	0.0848	0.0422	0.5608	2.5300e-003	0.3155	2.1100e-003	0.3177	0.0839	1.9400e-003	0.0859	0.0000	229.4329	229.4329	3.4100e-003	0.0000	229.5181
Total	**0.1259**	**1.7135**	**1.2454**	**7.4700e-003**	**0.4495**	**4.3300e-003**	**0.4538**	**0.1227**	**4.0600e-003**	**0.1267**	**0.0000**	**749.2735**	**749.2735**	**0.0751**	**0.0000**	**751.1508**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0384	0.4478	1.9546	3.2700e-003		2.1900e-003	2.1900e-003		2.4000e-003	2.4000e-003	0.0000	271.0943	271.0943	0.0497	0.0000	272.3372
Total	**0.0384**	**0.4478**	**1.9546**	**3.2700e-003**		**2.1900e-003**	**2.1900e-003**		**2.4000e-003**	**2.4000e-003**	**0.0000**	**271.0943**	**271.0943**	**0.0497**	**0.0000**	**272.3372**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0412	1.6713	0.6846	4.9400e-003	0.1339	2.2200e-003	0.1361	0.0387	2.1200e-003	0.0408	0.0000	519.8406	519.8406	0.0717	0.0000	521.6327
Worker	0.0848	0.0422	0.5608	2.5300e-003	0.3155	2.1100e-003	0.3177	0.0839	1.9400e-003	0.0859	0.0000	229.4329	229.4329	3.4100e-003	0.0000	229.5181
Total	**0.1259**	**1.7135**	**1.2454**	**7.4700e-003**	**0.4495**	**4.3300e-003**	**0.4538**	**0.1227**	**4.0600e-003**	**0.1267**	**0.0000**	**749.2735**	**749.2735**	**0.0751**	**0.0000**	**751.1508**

3.6 Building Construction - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1937	1.5630	1.8209	3.2500e-003		0.0611	0.0611		0.0585	0.0585	0.0000	270.0559	270.0559	0.0495	0.0000	271.2941
Total	**0.1937**	**1.5630**	**1.8209**	**3.2500e-003**		**0.0611**	**0.0611**		**0.0585**	**0.0585**	**0.0000**	**270.0559**	**270.0559**	**0.0495**	**0.0000**	**271.2941**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0400	1.6293	0.6878	4.8700e-003	0.1334	2.1200e-003	0.1355	0.0386	2.0300e-003	0.0406	0.0000	513.8804	513.8804	0.0715	0.0000	515.6685
Worker	0.0806	0.0391	0.5289	2.4500e-003	0.3143	1.9400e-003	0.3163	0.0836	1.7900e-003	0.0854	0.0000	221.6239	221.6239	3.1400e-003	0.0000	221.7023
Total	**0.1206**	**1.6684**	**1.2167**	**7.3200e-003**	**0.4478**	**4.0600e-003**	**0.4518**	**0.1222**	**3.8200e-003**	**0.1260**	**0.0000**	**735.5043**	**735.5043**	**0.0747**	**0.0000**	**737.3708**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0383	0.4461	1.9471	3.2500e-003		2.1800e-003	2.1800e-003		2.3900e-003	2.3900e-003	0.0000	270.0556	270.0556	0.0495	0.0000	271.2938
Total	**0.0383**	**0.4461**	**1.9471**	**3.2500e-003**		**2.1800e-003**	**2.1800e-003**		**2.3900e-003**	**2.3900e-003**	**0.0000**	**270.0556**	**270.0556**	**0.0495**	**0.0000**	**271.2938**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0400	1.6293	0.6878	4.8700e-003	0.1334	2.1200e-003	0.1355	0.0386	2.0300e-003	0.0406	0.0000	513.8804	513.8804	0.0715	0.0000	515.6685
Worker	0.0806	0.0391	0.5289	2.4500e-003	0.3143	1.9400e-003	0.3163	0.0836	1.7900e-003	0.0854	0.0000	221.6239	221.6239	3.1400e-003	0.0000	221.7023
Total	**0.1206**	**1.6684**	**1.2167**	**7.3200e-003**	**0.4478**	**4.0600e-003**	**0.4518**	**0.1222**	**3.8200e-003**	**0.1260**	**0.0000**	**735.5043**	**735.5043**	**0.0747**	**0.0000**	**737.3708**

3.6 Building Construction - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1944	1.5690	1.8279	3.2700e-003		0.0613	0.0613		0.0587	0.0587	0.0000	271.0946	271.0946	0.0497	0.0000	272.3375
Total	**0.1944**	**1.5690**	**1.8279**	**3.2700e-003**		**0.0613**	**0.0613**		**0.0587**	**0.0587**	**0.0000**	**271.0946**	**271.0946**	**0.0497**	**0.0000**	**272.3375**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0392	1.6006	0.6943	4.8400e-003	0.1339	2.0400e-003	0.1360	0.0387	1.9500e-003	0.0407	0.0000	512.0827	512.0827	0.0720	0.0000	513.8820
Worker	0.0769	0.0366	0.5035	2.3900e-003	0.3155	1.8100e-003	0.3174	0.0839	1.6700e-003	0.0856	0.0000	216.4081	216.4081	2.9200e-003	0.0000	216.4811
Total	**0.1161**	**1.6371**	**1.1978**	**7.2300e-003**	**0.4495**	**3.8500e-003**	**0.4533**	**0.1227**	**3.6200e-003**	**0.1263**	**0.0000**	**728.4908**	**728.4908**	**0.0749**	**0.0000**	**730.3630**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0384	0.4478	1.9546	3.2700e-003		2.1900e-003	2.1900e-003		2.4000e-003	2.4000e-003	0.0000	271.0943	271.0943	0.0497	0.0000	272.3372
Total	**0.0384**	**0.4478**	**1.9546**	**3.2700e-003**		**2.1900e-003**	**2.1900e-003**		**2.4000e-003**	**2.4000e-003**	**0.0000**	**271.0943**	**271.0943**	**0.0497**	**0.0000**	**272.3372**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0392	1.6006	0.6943	4.8400e-003	0.1339	2.0400e-003	0.1360	0.0387	1.9500e-003	0.0407	0.0000	512.0827	512.0827	0.0720	0.0000	513.8820
Worker	0.0769	0.0366	0.5035	2.3900e-003	0.3155	1.8100e-003	0.3174	0.0839	1.6700e-003	0.0856	0.0000	216.4081	216.4081	2.9200e-003	0.0000	216.4811
Total	**0.1161**	**1.6371**	**1.1978**	**7.2300e-003**	**0.4495**	**3.8500e-003**	**0.4533**	**0.1227**	**3.6200e-003**	**0.1263**	**0.0000**	**728.4908**	**728.4908**	**0.0749**	**0.0000**	**730.3630**

3.7 Architectural Coating - 2028

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.4851					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.0222	0.1489	0.2352	3.9000e-004		6.7000e-003	6.7000e-003		6.7000e-003	6.7000e-003	0.0000	33.1923	33.1923	1.8100e-003	0.0000	33.2376
Total	**2.5073**	**0.1489**	**0.2352**	**3.9000e-004**		**6.7000e-003**	**6.7000e-003**		**6.7000e-003**	**6.7000e-003**	**0.0000**	**33.1923**	**33.1923**	**1.8100e-003**	**0.0000**	**33.2376**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0161	7.7900e-003	0.1054	4.9000e-004	0.0627	3.9000e-004	0.0631	0.0167	3.6000e-004	0.0170	0.0000	44.1799	44.1799	6.3000e-004	0.0000	44.1956
Total	**0.0161**	**7.7900e-003**	**0.1054**	**4.9000e-004**	**0.0627**	**3.9000e-004**	**0.0631**	**0.0167**	**3.6000e-004**	**0.0170**	**0.0000**	**44.1799**	**44.1799**	**6.3000e-004**	**0.0000**	**44.1956**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.4851					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.8600e-003	0.0167	0.2382	3.9000e-004		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	33.1923	33.1923	1.8100e-003	0.0000	33.2375
Total	**2.4890**	**0.0167**	**0.2382**	**3.9000e-004**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**	**0.0000**	**33.1923**	**33.1923**	**1.8100e-003**	**0.0000**	**33.2375**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0161	7.7900e-003	0.1054	4.9000e-004	0.0627	3.9000e-004	0.0631	0.0167	3.6000e-004	0.0170	0.0000	44.1799	44.1799	6.3000e-004	0.0000	44.1956
Total	**0.0161**	**7.7900e-003**	**0.1054**	**4.9000e-004**	**0.0627**	**3.9000e-004**	**0.0631**	**0.0167**	**3.6000e-004**	**0.0170**	**0.0000**	**44.1799**	**44.1799**	**6.3000e-004**	**0.0000**	**44.1956**

3.7 Architectural Coating - 2029

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.4946					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0223	0.1495	0.2361	3.9000e-004		6.7200e-003	6.7200e-003		6.7200e-003	6.7200e-003	0.0000	33.3200	33.3200	1.8200e-003	0.0000	33.3654
Total	**2.5169**	**0.1495**	**0.2361**	**3.9000e-004**		**6.7200e-003**	**6.7200e-003**		**6.7200e-003**	**6.7200e-003**	**0.0000**	**33.3200**	**33.3200**	**1.8200e-003**	**0.0000**	**33.3654**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0153	7.2900e-003	0.1004	4.8000e-004	0.0629	3.6000e-004	0.0633	0.0167	3.3000e-004	0.0171	0.0000	43.1402	43.1402	5.8000e-004	0.0000	43.1547
Total	**0.0153**	**7.2900e-003**	**0.1004**	**4.8000e-004**	**0.0629**	**3.6000e-004**	**0.0633**	**0.0167**	**3.3000e-004**	**0.0171**	**0.0000**	**43.1402**	**43.1402**	**5.8000e-004**	**0.0000**	**43.1547**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.4946					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.8800e-003	0.0168	0.2391	3.9000e-004		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	33.3199	33.3199	1.8200e-003	0.0000	33.3654
Total	**2.4985**	**0.0168**	**0.2391**	**3.9000e-004**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**	**0.0000**	**33.3199**	**33.3199**	**1.8200e-003**	**0.0000**	**33.3654**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0153	7.2900e-003	0.1004	4.8000e-004	0.0629	3.6000e-004	0.0633	0.0167	3.3000e-004	0.0171	0.0000	43.1402	43.1402	5.8000e-004	0.0000	43.1547
Total	**0.0153**	**7.2900e-003**	**0.1004**	**4.8000e-004**	**0.0629**	**3.6000e-004**	**0.0633**	**0.0167**	**3.3000e-004**	**0.0171**	**0.0000**	**43.1402**	**43.1402**	**5.8000e-004**	**0.0000**	**43.1547**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Hospital	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Hospital	9.50	7.30	7.30	64.90	16.10	19.00	73	25	2

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Hospital	0.601973	0.036168	0.193150	0.092307	0.012222	0.005292	0.035273	0.009746	0.004298	0.002300	0.005708	0.000958	0.000606

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Hospital	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Hospital	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Hospital	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e

Land Use	kWh/yr	MT/yr			
Hospital	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	8.0000e-004	8.0000e-005	8.7300e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0171	0.0171	4.0000e-005	0.0000	0.0182
Unmitigated	8.0000e-004	8.0000e-005	8.7300e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0171	0.0171	4.0000e-005	0.0000	0.0182

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.0000e-004	8.0000e-005	8.7300e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0171	0.0171	4.0000e-005	0.0000	0.0182
Total	**8.0000e-004**	**8.0000e-005**	**8.7300e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0171**	**0.0171**	**4.0000e-005**	**0.0000**	**0.0182**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	8.0000e-004	8.0000e-005	8.7300e-003	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.0171	0.0171	4.0000e-005	0.0000	0.0182
Total	**8.0000e-004**	**8.0000e-005**	**8.7300e-003**	**0.0000**		**3.0000e-005**	**3.0000e-005**		**3.0000e-005**	**3.0000e-005**	**0.0000**	**0.0171**	**0.0171**	**4.0000e-005**	**0.0000**	**0.0182**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Hospital	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Hospital	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Hospital	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

Hospital	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

UCSF Irving Street Arrival Construction Only

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Enclosed Parking with Elevator	25.00	1000sqft	0.57	25,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2024
Utility Company	City and County of San Francisco				
CO2 Intensity (lb/MWhr)	76.28	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - UCSF is its own electricity provider

Land Use -

Construction Phase - Construction schedule per applicant RFI response.

Trips and VMT - Haul trips for 1,000 cy

Demolition -

Grading -

Consumer Products - Constrution run only

Area Coating - Constrution run only

Landscape Equipment - Constrution run only

Energy Use - Constrution run only

Water And Wastewater -

Construction Off-road Equipment Mitigation - Tier 4 final as mitigation

Table Name	Column Name	Default Value	New Value
tblAreaCoating	ReapplicationRatePercent	10	0
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	10.00	66.00
tblConstructionPhase	NumDays	5.00	132.00
tblConstructionPhase	NumDays	1.00	66.00
tblConstructionPhase	NumDays	100.00	326.00

tblConstructionPhase	NumDays	5.00	152.00
tblEnergyUse	LightingElect	1.75	0.00
tblEnergyUse	NT24E	0.19	0.00
tblEnergyUse	T24E	3.92	0.00
tblGrading	MaterialExported	0.00	1,000.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0994	1.0016	0.9710	1.8500e-003	0.0493	0.0458	0.0952	8.5600e-003	0.0427	0.0512	0.0000	164.0171	164.0171	0.0415	0.0000	165.0555
2023	0.0807	0.8153	0.8923	1.5900e-003	0.0136	0.0386	0.0521	3.6800e-003	0.0355	0.0392	0.0000	141.8031	141.8031	0.0406	0.0000	142.8181
Maximum	**0.0994**	**1.0016**	**0.9710**	**1.8500e-003**	**0.0493**	**0.0458**	**0.0952**	**8.5600e-003**	**0.0427**	**0.0512**	**0.0000**	**164.0171**	**164.0171**	**0.0415**	**0.0000**	**165.0555**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0237	0.1386	1.0489	1.8500e-003	0.0493	2.6500e-003	0.0520	8.5600e-003	2.6300e-003	0.0112	0.0000	164.0169	164.0169	0.0415	0.0000	165.0553
2023	0.0214	0.1176	0.9676	1.5900e-003	0.0136	2.3700e-003	0.0159	3.6800e-003	2.3600e-003	6.0400e-003	0.0000	141.8030	141.8030	0.0406	0.0000	142.8180

Maximum	**0.0237**	**0.1386**	**1.0489**	**1.8500e-003**	**0.0493**	**2.6500e-003**	**0.0520**	**8.5600e-003**	**2.6300e-003**	**0.0112**	**0.0000**	**164.0169**	**164.0169**	**0.0415**	**0.0000**	**165.0553**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**74.95**	**85.90**	**-8.22**	**0.00**	**0.00**	**94.05**	**53.90**	**0.00**	**93.62**	**80.94**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
10	**1-9-2022**	**4-8-2022**	0.3142	0.0459
11	**4-9-2022**	**7-8-2022**	0.4261	0.0615
12	**7-9-2022**	**10-8-2022**	0.1113	0.0167
13	**10-9-2022**	**1-8-2023**	0.2676	0.0406
14	**1-9-2023**	**4-8-2023**	0.2400	0.0373
15	**4-9-2023**	**7-8-2023**	0.2463	0.0380
16	**7-9-2023**	**9-30-2023**	0.2238	0.0346
		Highest	0.4261	0.0615

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.6400e-003	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.5000e-004	4.5000e-004	0.0000	0.0000	4.8000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	**1.6400e-003**	**0.0000**	**2.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**4.5000e-004**	**4.5000e-004**	**0.0000**	**0.0000**	**4.8000e-004**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.6400e-003	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.5000e-004	4.5000e-004	0.0000	0.0000	4.8000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.6400e-003**	**0.0000**	**2.3000e-004**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**4.5000e-004**	**4.5000e-004**	**0.0000**	**0.0000**	**4.8000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	3/1/2022	5/31/2022	5	66	
2	Excavation	Site Preparation	3/1/2022	5/31/2022	5	66	
3	Foundations Concrete Pour	Paving	3/1/2022	5/31/2022	5	132	
4	Building Construction	Building Construction	9/1/2022	11/30/2023	5	326	

5	Architectural Coating	Architectural Coating	6/1/2023	6/7/2023	5	152	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.57

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 1,500

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Foundations Concrete Pour	Cement and Mortar Mixers	4	6.00	9	0.56
Foundations Concrete Pour	Pavers	1	7.00	130	0.42
Foundations Concrete Pour	Rollers	1	7.00	80	0.38
Foundations Concrete Pour	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Excavation	Graders	1	8.00	187	0.41
Excavation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	136.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Foundations Concrete Pour	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Excavation	2	5.00	0.00	125.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Building Construction	5	11.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	2.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0160	0.0000	0.0160	2.4200e-003	0.0000	2.4200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0234	0.2117	0.2465	4.0000e-004		0.0111	0.0111		0.0106	0.0106	0.0000	34.3649	34.3649	6.3400e-003	0.0000	34.5235
Total	**0.0234**	**0.2117**	**0.2465**	**4.0000e-004**	**0.0160**	**0.0111**	**0.0271**	**2.4200e-003**	**0.0106**	**0.0131**	**0.0000**	**34.3649**	**34.3649**	**6.3400e-003**	**0.0000**	**34.5235**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.9000e-004	0.0202	7.3800e-003	5.0000e-005	1.1400e-003	6.0000e-005	1.2000e-003	3.1000e-004	5.0000e-005	3.7000e-004	0.0000	5.8567	5.8567	1.1000e-003	0.0000	5.8842
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.9000e-004	5.4000e-004	6.3900e-003	3.0000e-005	2.6100e-003	2.0000e-005	2.6300e-003	6.9000e-004	2.0000e-005	7.1000e-004	0.0000	2.3010	2.3010	4.0000e-005	0.0000	2.3022

Total	**1.3800e-003**	**0.0207**	**0.0138**	**8.0000e-005**	**3.7500e-003**	**8.0000e-005**	**3.8300e-003**	**1.0000e-003**	**7.0000e-005**	**1.0800e-003**	**0.0000**	**8.1578**	**8.1578**	**1.1400e-003**	**0.0000**	**8.1864**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0160	0.0000	0.0160	2.4200e-003	0.0000	2.4200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.3800e-003	0.0190	0.2591	4.0000e-004		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	34.3648	34.3648	6.3400e-003	0.0000	34.5234
Total	**4.3800e-003**	**0.0190**	**0.2591**	**4.0000e-004**	**0.0160**	**5.8000e-004**	**0.0166**	**2.4200e-003**	**5.8000e-004**	**3.0000e-003**	**0.0000**	**34.3648**	**34.3648**	**6.3400e-003**	**0.0000**	**34.5234**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.9000e-004	0.0202	7.3800e-003	5.0000e-005	1.1400e-003	6.0000e-005	1.2000e-003	3.1000e-004	5.0000e-005	3.7000e-004	0.0000	5.8567	5.8567	1.1000e-003	0.0000	5.8842
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	8.9000e-004	5.4000e-004	6.3900e-003	3.0000e-005	2.6100e-003	2.0000e-005	2.6300e-003	6.9000e-004	2.0000e-005	7.1000e-004	0.0000	2.3010	2.3010	4.0000e-005	0.0000	2.3022
Total	**1.3800e-003**	**0.0207**	**0.0138**	**8.0000e-005**	**3.7500e-003**	**8.0000e-005**	**3.8300e-003**	**1.0000e-003**	**7.0000e-005**	**1.0800e-003**	**0.0000**	**8.1578**	**8.1578**	**1.1400e-003**	**0.0000**	**8.1864**

3.3 Excavation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0177	0.0000	0.0177	1.9100e-003	0.0000	1.9100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0191	0.2288	0.1307	3.2000e-004		8.4900e-003	8.4900e-003		7.8100e-003	7.8100e-003	0.0000	28.2163	28.2163	9.1300e-003	0.0000	28.4444
Total	**0.0191**	**0.2288**	**0.1307**	**3.2000e-004**	**0.0177**	**8.4900e-003**	**0.0261**	**1.9100e-003**	**7.8100e-003**	**9.7200e-003**	**0.0000**	**28.2163**	**28.2163**	**9.1300e-003**	**0.0000**	**28.4444**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.5000e-004	0.0186	6.7800e-003	5.0000e-005	1.0500e-003	5.0000e-005	1.1000e-003	2.9000e-004	5.0000e-005	3.4000e-004	0.0000	5.3830	5.3830	1.0100e-003	0.0000	5.4083
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.4000e-004	2.7000e-004	3.2000e-003	1.0000e-005	1.3000e-003	1.0000e-005	1.3100e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	1.1505	1.1505	2.0000e-005	0.0000	1.1511
Total	**8.9000e-004**	**0.0188**	**9.9800e-003**	**6.0000e-005**	**2.3500e-003**	**6.0000e-005**	**2.4100e-003**	**6.4000e-004**	**6.0000e-005**	**7.0000e-004**	**0.0000**	**6.5336**	**6.5336**	**1.0300e-003**	**0.0000**	**6.5594**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Fugitive Dust					0.0177	0.0000	0.0177	1.9100e-003	0.0000	1.9100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.9300e-003	0.0170	0.1755	3.2000e-004		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	28.2162	28.2162	9.1300e-003	0.0000	28.4444
Total	**3.9300e-003**	**0.0170**	**0.1755**	**3.2000e-004**	**0.0177**	**5.2000e-004**	**0.0182**	**1.9100e-003**	**5.2000e-004**	**2.4300e-003**	**0.0000**	**28.2162**	**28.2162**	**9.1300e-003**	**0.0000**	**28.4444**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.5000e-004	0.0186	6.7800e-003	5.0000e-005	1.0500e-003	5.0000e-005	1.1000e-003	2.9000e-004	5.0000e-005	3.4000e-004	0.0000	5.3830	5.3830	1.0100e-003	0.0000	5.4083
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.4000e-004	2.7000e-004	3.2000e-003	1.0000e-005	1.3000e-003	1.0000e-005	1.3100e-003	3.5000e-004	1.0000e-005	3.6000e-004	0.0000	1.1505	1.1505	2.0000e-005	0.0000	1.1511
Total	**8.9000e-004**	**0.0188**	**9.9800e-003**	**6.0000e-005**	**2.3500e-003**	**6.0000e-005**	**2.4100e-003**	**6.4000e-004**	**6.0000e-005**	**7.0000e-004**	**0.0000**	**6.5336**	**6.5336**	**1.0300e-003**	**0.0000**	**6.5594**

3.4 Foundations Concrete Pour - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0214	0.1953	0.2322	3.7000e-004		9.7700e-003	9.7700e-003		9.1000e-003	9.1000e-003	0.0000	31.0096	31.0096	9.0300e-003	0.0000	31.2354
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0214**	**0.1953**	**0.2322**	**3.7000e-004**		**9.7700e-003**	**9.7700e-003**		**9.1000e-003**	**9.1000e-003**	**0.0000**	**31.0096**	**31.0096**	**9.0300e-003**	**0.0000**	**31.2354**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5900e-003	9.8000e-004	0.0115	5.0000e-005	4.6900e-003	3.0000e-005	4.7300e-003	1.2500e-003	3.0000e-005	1.2800e-003	0.0000	4.1419	4.1419	8.0000e-005	0.0000	4.1439
Total	**1.5900e-003**	**9.8000e-004**	**0.0115**	**5.0000e-005**	**4.6900e-003**	**3.0000e-005**	**4.7300e-003**	**1.2500e-003**	**3.0000e-005**	**1.2800e-003**	**0.0000**	**4.1419**	**4.1419**	**8.0000e-005**	**0.0000**	**4.1439**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6900e-003	0.0160	0.2278	3.7000e-004		4.9000e-004	4.9000e-004		4.9000e-004	4.9000e-004	0.0000	31.0095	31.0095	9.0300e-003	0.0000	31.2354
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.6900e-003**	**0.0160**	**0.2278**	**3.7000e-004**		**4.9000e-004**	**4.9000e-004**		**4.9000e-004**	**4.9000e-004**	**0.0000**	**31.0095**	**31.0095**	**9.0300e-003**	**0.0000**	**31.2354**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.5900e-003	9.8000e-004	0.0115	5.0000e-005	4.6900e-003	3.0000e-005	4.7300e-003	1.2500e-003	3.0000e-005	1.2800e-003	0.0000	4.1419	4.1419	8.0000e-005	0.0000	4.1439
Total	**1.5900e-003**	**9.8000e-004**	**0.0115**	**5.0000e-005**	**4.6900e-003**	**3.0000e-005**	**4.7300e-003**	**1.2500e-003**	**3.0000e-005**	**1.2800e-003**	**0.0000**	**4.1419**	**4.1419**	**8.0000e-005**	**0.0000**	**4.1439**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0299	0.3056	0.3111	5.0000e-004		0.0162	0.0162		0.0149	0.0149	0.0000	43.5643	43.5643	0.0141	0.0000	43.9165
Total	**0.0299**	**0.3056**	**0.3111**	**5.0000e-004**		**0.0162**	**0.0162**		**0.0149**	**0.0149**	**0.0000**	**43.5643**	**43.5643**	**0.0141**	**0.0000**	**43.9165**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor	5.0000e-004	0.0189	5.9800e-003	5.0000e-005	1.1400e-003	4.0000e-005	1.1800e-003	3.3000e-004	4.0000e-005	3.7000e-004	0.0000	4.6924	4.6924	6.2000e-004	0.0000	4.7080
Worker	1.2800e-003	7.9000e-004	9.2700e-003	4.0000e-005	3.7800e-003	3.0000e-005	3.8100e-003	1.0100e-003	3.0000e-005	1.0300e-003	0.0000	3.3365	3.3365	6.0000e-005	0.0000	3.3381
Total	**1.7800e-003**	**0.0197**	**0.0153**	**9.0000e-005**	**4.9200e-003**	**7.0000e-005**	**4.9900e-003**	**1.3400e-003**	**7.0000e-005**	**1.4000e-003**	**0.0000**	**8.0290**	**8.0290**	**6.8000e-004**	**0.0000**	**8.0461**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	6.0800e-003	0.0263	0.3361	5.0000e-004		8.1000e-004	8.1000e-004		8.1000e-004	8.1000e-004	0.0000	43.5642	43.5642	0.0141	0.0000	43.9164
Total	**6.0800e-003**	**0.0263**	**0.3361**	**5.0000e-004**		**8.1000e-004**	**8.1000e-004**		**8.1000e-004**	**8.1000e-004**	**0.0000**	**43.5642**	**43.5642**	**0.0141**	**0.0000**	**43.9164**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.0000e-004	0.0189	5.9800e-003	5.0000e-005	1.1400e-003	4.0000e-005	1.1800e-003	3.3000e-004	4.0000e-005	3.7000e-004	0.0000	4.6924	4.6924	6.2000e-004	0.0000	4.7080
Worker	1.2800e-003	7.9000e-004	9.2700e-003	4.0000e-005	3.7800e-003	3.0000e-005	3.8100e-003	1.0100e-003	3.0000e-005	1.0300e-003	0.0000	3.3365	3.3365	6.0000e-005	0.0000	3.3381
Total	**1.7800e-003**	**0.0197**	**0.0153**	**9.0000e-005**	**4.9200e-003**	**7.0000e-005**	**4.9900e-003**	**1.3400e-003**	**7.0000e-005**	**1.4000e-003**	**0.0000**	**8.0290**	**8.0290**	**6.8000e-004**	**0.0000**	**8.0461**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0756	0.7670	0.8481	1.3600e-003		0.0383	0.0383		0.0352	0.0352	0.0000	119.7491	119.7491	0.0387	0.0000	120.7173
Total	**0.0756**	**0.7670**	**0.8481**	**1.3600e-003**		**0.0383**	**0.0383**		**0.0352**	**0.0352**	**0.0000**	**119.7491**	**119.7491**	**0.0387**	**0.0000**	**120.7173**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-003	0.0430	0.0159	1.2000e-004	3.1200e-003	6.0000e-005	3.1900e-003	9.0000e-004	6.0000e-005	9.6000e-004	0.0000	12.5704	12.5704	1.6700e-003	0.0000	12.6122
Worker	3.3400e-003	1.9600e-003	0.0238	1.0000e-004	0.0104	8.0000e-005	0.0105	2.7600e-003	7.0000e-005	2.8300e-003	0.0000	8.8118	8.8118	1.6000e-004	0.0000	8.8158
Total	**4.4400e-003**	**0.0450**	**0.0396**	**2.2000e-004**	**0.0135**	**1.4000e-004**	**0.0137**	**3.6600e-003**	**1.3000e-004**	**3.7900e-003**	**0.0000**	**21.3822**	**21.3822**	**1.8300e-003**	**0.0000**	**21.4280**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0167	0.0723	0.9233	1.3600e-003		2.2300e-003	2.2300e-003		2.2300e-003	2.2300e-003	0.0000	119.7489	119.7489	0.0387	0.0000	120.7172
Total	**0.0167**	**0.0723**	**0.9233**	**1.3600e-003**		**2.2300e-003**	**2.2300e-003**		**2.2300e-003**	**2.2300e-003**	**0.0000**	**119.7489**	**119.7489**	**0.0387**	**0.0000**	**120.7172**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-003	0.0430	0.0159	1.2000e-004	3.1200e-003	6.0000e-005	3.1900e-003	9.0000e-004	6.0000e-005	9.6000e-004	0.0000	12.5704	12.5704	1.6700e-003	0.0000	12.6122
Worker	3.3400e-003	1.9600e-003	0.0238	1.0000e-004	0.0104	8.0000e-005	0.0105	2.7600e-003	7.0000e-005	2.8300e-003	0.0000	8.8118	8.8118	1.6000e-004	0.0000	8.8158
Total	**4.4400e-003**	**0.0450**	**0.0396**	**2.2000e-004**	**0.0135**	**1.4000e-004**	**0.0137**	**3.6600e-003**	**1.3000e-004**	**3.7900e-003**	**0.0000**	**21.3822**	**21.3822**	**1.8300e-003**	**0.0000**	**21.4280**

3.6 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.7000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	4.8000e-004	3.2600e-003	4.5300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6393
Total	**6.5000e-004**	**3.2600e-003**	**4.5300e-003**	**1.0000e-005**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6393**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0335	0.0335	0.0000	0.0000	0.0335
Total	**1.0000e-005**	**1.0000e-005**	**9.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0335**	**0.0335**	**0.0000**	**0.0000**	**0.0335**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.7000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.0000e-005	3.2000e-004	4.5800e-003	1.0000e-005		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6393
Total	**2.4000e-004**	**3.2000e-004**	**4.5800e-003**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6393**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0335	0.0335	0.0000	0.0000	0.0335
Total	**1.0000e-005**	**1.0000e-005**	**9.0000e-005**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0335**	**0.0335**	**0.0000**	**0.0000**	**0.0335**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate	Unmitigated	Mitigated

Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Enclosed Parking with Elevator	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Enclosed Parking with Elevator	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Enclosed Parking with Elevator	0.604697	0.038136	0.192426	0.089922	0.013708	0.005077	0.031210	0.009257	0.004288	0.003553	0.006262	0.000945	0.000519

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			

Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.6400e-003	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.5000e-004	4.5000e-004	0.0000	0.0000	4.8000e-004
Unmitigated	1.6400e-003	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.5000e-004	4.5000e-004	0.0000	0.0000	4.8000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.6200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.5000e-004	4.5000e-004	0.0000	0.0000	4.8000e-004
Total	**1.6400e-003**	**0.0000**	**2.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**4.5000e-004**	**4.5000e-004**	**0.0000**	**0.0000**	**4.8000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.6200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	2.3000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.5000e-004	4.5000e-004	0.0000	0.0000	4.8000e-004
Total	**1.6400e-003**	**0.0000**	**2.3000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**4.5000e-004**	**4.5000e-004**	**0.0000**	**0.0000**	**4.8000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Enclosed Parking with Elevator	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Enclosed Parking with Elevator	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

UCSF CPHP RAB Construction

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Research & Development	270.00	1000sqft	2.50	270,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2026
Utility Company					
CO2 Intensity (lb/MWhr)	605.78	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - UCSF is it own ekectricity provider

Land Use - Adjust acreage to match project site.

Construction Phase - Construction schedule provided by applicant.

Trips and VMT -

Demolition - Includes 145.000 sf for UC Hall and 88,000 sf for School of nursing.

Grading - Excavation volume provided by applicant.

Vehicle Trips - Construction run only

Consumer Products - Construction run only. No operational emissions

Energy Use - Construction run only.

Water And Wastewater - Construction run only.

Solid Waste - Construction run only.

Construction Off-road Equipment Mitigation - Tier 4 final as mitigation

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstEquipMitigation	Tier	No Change	Tier 4 Final
tblConstructionPhase	NumDays	10.00	523.00
tblConstructionPhase	NumDays	220.00	130.00
tblConstructionPhase	NumDays	220.00	675.00
tblConstructionPhase	NumDays	20.00	66.00
tblConstructionPhase	NumDays	6.00	219.00

tblConstructionPhase	NumDays	3.00	66.00
tblConsumerProducts	ROG_EF	2.14E-05	0
tblConsumerProducts	ROG_EF_Degreaser	3.542E-07	0
tblEnergyUse	LightingElect	2.99	0.00
tblEnergyUse	NT24E	3.36	0.00
tblEnergyUse	NT24NG	6.90	0.00
tblEnergyUse	T24E	1.21	0.00
tblEnergyUse	T24NG	17.85	0.00
tblGrading	AcresOfGrading	109.50	3.00
tblGrading	AcresOfGrading	99.00	4.50
tblGrading	MaterialExported	0.00	27,363.00
tblGrading	MaterialExported	0.00	50,104.00
tblLandUse	LotAcreage	6.20	2.50
tblSolidWaste	SolidWasteGenerationRate	20.52	0.00
tblVehicleTrips	ST_TR	1.90	0.00
tblVehicleTrips	SU_TR	1.11	0.00
tblVehicleTrips	WD_TR	8.11	0.00
tblWater	AerobicPercent	87.46	100.00
tblWater	AnaerobicandFacultativeLagoonsPercent	2.21	0.00
tblWater	ElectricityIntensityFactorForWastewaterTreatment	1,911.00	0.00
tblWater	IndoorWaterUseRate	132,757,365.74	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.3331	4.5442	2.5417	8.2300e-003	0.8955	0.1404	1.0359	0.4107	0.1300	0.5407	0.0000	800.1160	800.1160	0.1876	0.0000	804.8070
2023	0.2644	2.3024	2.2398	5.5300e-003	0.1257	0.0812	0.2069	0.0343	0.0778	0.1121	0.0000	495.3826	495.3826	0.0724	0.0000	497.1930
2024	0.9835	2.3637	2.5021	6.0700e-003	0.1443	0.0800	0.2243	0.0393	0.0769	0.1161	0.0000	542.5779	542.5779	0.0742	0.0000	544.4323
2025	0.9625	2.2269	2.4656	5.9900e-003	0.1437	0.0695	0.2132	0.0391	0.0668	0.1059	0.0000	535.6264	535.6264	0.0729	0.0000	537.4497
Maximum	**0.9835**	**4.5442**	**2.5417**	**8.2300e-003**	**0.8955**	**0.1404**	**1.0359**	**0.4107**	**0.1300**	**0.5407**	**0.0000**	**800.1160**	**800.1160**	**0.1876**	**0.0000**	**804.8070**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.0932	1.7037	2.8173	8.2300e-003	0.8955	0.0107	0.9062	0.4107	0.0105	0.4212	0.0000	800.1155	800.1155	0.1876	0.0000	804.8066
2023	0.0845	1.0345	2.3335	5.5300e-003	0.1257	5.9600e-003	0.1317	0.0343	5.8800e-003	0.0402	0.0000	495.3822	495.3822	0.0724	0.0000	497.1927
2024	0.7977	1.0481	2.6145	6.0700e-003	0.1443	6.6200e-003	0.1509	0.0393	6.5200e-003	0.0458	0.0000	542.5776	542.5776	0.0742	0.0000	544.4320
2025	0.7927	1.0303	2.5898	5.9900e-003	0.1437	6.5600e-003	0.1503	0.0391	6.4700e-003	0.0456	0.0000	535.6260	535.6260	0.0729	0.0000	537.4494
Maximum	**0.7977**	**1.7037**	**2.8173**	**8.2300e-003**	**0.8955**	**0.0107**	**0.9062**	**0.4107**	**0.0105**	**0.4212**	**0.0000**	**800.1155**	**800.1155**	**0.1876**	**0.0000**	**804.8066**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**30.49**	**57.89**	**-6.22**	**0.00**	**0.00**	**91.95**	**20.30**	**0.00**	**91.63**	**36.81**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
4	**3-1-2022**	**5-31-2022**	2.8268	1.2026

5	6-1-2022	8-31-2022	0.7625	0.1980
6	9-1-2022	11-30-2022	0.7571	0.1988
7	12-1-2022	2-28-2023	0.9160	0.3554
8	3-1-2023	5-31-2023	0.6478	0.2818
9	6-1-2023	8-31-2023	0.6468	0.2809
10	9-1-2023	11-30-2023	0.6416	0.2797
11	12-1-2023	2-29-2024	0.7671	0.3982
12	3-1-2024	5-31-2024	0.8386	0.4620
13	6-1-2024	8-31-2024	0.8376	0.4610
14	9-1-2024	11-30-2024	0.8305	0.4580
15	12-1-2024	2-28-2025	0.7989	0.4514
16	3-1-2025	5-31-2025	0.8021	0.4581
17	6-1-2025	8-31-2025	0.8011	0.4571
18	9-1-2025	9-30-2025	0.2612	0.1491
		Highest	2.8268	1.2026

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1410	2.0000e-005	2.4700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8200e-003	4.8200e-003	1.0000e-005	0.0000	5.1400e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	**0.1410**	**2.0000e-005**	**2.4700e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.8200e-003**	**4.8200e-003**	**1.0000e-005**	**0.0000**	**5.1400e-003**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1410	2.0000e-005	2.4700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8200e-003	4.8200e-003	1.0000e-005	0.0000	5.1400e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1410**	**2.0000e-005**	**2.4700e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.8200e-003**	**4.8200e-003**	**1.0000e-005**	**0.0000**	**5.1400e-003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	3/1/2022	5/31/2022	5	66	
2	Site Preparation	Site Preparation	3/1/2022	5/31/2022	5	66	
3	Grading	Grading	3/1/2022	12/31/2022	5	219	
4	Draiange/Utilities/Subgrade	Trenching	3/1/2022	5/31/2022	5	66	

5	Foundations/Concrete Pour	Building Construction	12/1/2022	5/31/2023	5	130	
6	Building Construction	Building Construction	6/1/2023	12/31/2025	5	675	
7	Architectural Coating	Architectural Coating	1/1/2024	12/31/2025	5	523	

Acres of Grading (Site Preparation Phase): 4.5

Acres of Grading (Grading Phase): 3

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 405,000; Non-Residential Outdoor: 135,000; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Site Preparation	Graders	1	8.00	187	0.41
Site Preparation	Scrapers	1	8.00	367	0.48
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	2	7.00	97	0.37
Foundations/Concrete Pour	Cranes	1	8.00	231	0.29
Foundations/Concrete Pour	Forklifts	2	7.00	89	0.20
Foundations/Concrete Pour	Generator Sets	1	8.00	84	0.74
Foundations/Concrete Pour	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Foundations/Concrete Pour	Welders	3	8.00	46	0.45
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	2	7.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Building Construction	Welders	3	8.00	46	0.45

Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	1,060.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	4,954.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	3,420.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Draiange/Utilities/Subgrade			0.00	0.00	10.80	7.30				
Foundations/Concrete Pour	8	86.00	44.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	8	86.00	44.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	17.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

3.2 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1242	0.0000	0.1242	0.0188	0.0000	0.0188	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0557	0.5485	0.4607	8.0000e-004		0.0277	0.0277		0.0258	0.0258	0.0000	69.5564	69.5564	0.0177	0.0000	69.9995
Total	**0.0557**	**0.5485**	**0.4607**	**8.0000e-004**	**0.1242**	**0.0277**	**0.1518**	**0.0188**	**0.0258**	**0.0446**	**0.0000**	**69.5564**	**69.5564**	**0.0177**	**0.0000**	**69.9995**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.8300e-003	0.1575	0.0575	4.2000e-004	8.8900e-003	4.3000e-004	9.3200e-003	2.4400e-003	4.1000e-004	2.8500e-003	0.0000	45.6481	45.6481	8.5700e-003	0.0000	45.8625
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1500e-003	7.0000e-004	8.3100e-003	3.0000e-005	3.3900e-003	3.0000e-005	3.4200e-003	9.0000e-004	2.0000e-005	9.3000e-004	0.0000	2.9914	2.9914	6.0000e-005	0.0000	2.9928
Total	**4.9800e-003**	**0.1582**	**0.0658**	**4.5000e-004**	**0.0123**	**4.6000e-004**	**0.0127**	**3.3400e-003**	**4.3000e-004**	**3.7800e-003**	**0.0000**	**48.6395**	**48.6395**	**8.6300e-003**	**0.0000**	**48.8553**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1242	0.0000	0.1242	0.0188	0.0000	0.0188	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.2800e-003	0.0402	0.4857	8.0000e-004		1.2400e-003	1.2400e-003		1.2400e-003	1.2400e-003	0.0000	69.5563	69.5563	0.0177	0.0000	69.9994
Total	**9.2800e-003**	**0.0402**	**0.4857**	**8.0000e-004**	**0.1242**	**1.2400e-003**	**0.1254**	**0.0188**	**1.2400e-003**	**0.0200**	**0.0000**	**69.5563**	**69.5563**	**0.0177**	**0.0000**	**69.9994**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	3.8300e-003	0.1575	0.0575	4.2000e-004	8.8900e-003	4.3000e-004	9.3200e-003	2.4400e-003	4.1000e-004	2.8500e-003	0.0000	45.6481	45.6481	8.5700e-003	0.0000	45.8625
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1500e-003	7.0000e-004	8.3100e-003	3.0000e-005	3.3900e-003	3.0000e-005	3.4200e-003	9.0000e-004	2.0000e-005	9.3000e-004	0.0000	2.9914	2.9914	6.0000e-005	0.0000	2.9928
Total	**4.9800e-003**	**0.1582**	**0.0658**	**4.5000e-004**	**0.0123**	**4.6000e-004**	**0.0127**	**3.3400e-003**	**4.3000e-004**	**3.7800e-003**	**0.0000**	**48.6395**	**48.6395**	**8.6300e-003**	**0.0000**	**48.8553**

3.3 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0455	0.5170	0.3318	8.1000e-004		0.0196	0.0196		0.0181	0.0181	0.0000	71.1053	71.1053	0.0230	0.0000	71.6802
Total	**0.0455**	**0.5170**	**0.3318**	**8.1000e-004**	**2.3900e-003**	**0.0196**	**0.0220**	**2.6000e-004**	**0.0181**	**0.0183**	**0.0000**	**71.1053**	**71.1053**	**0.0230**	**0.0000**	**71.6802**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0179	0.7358	0.2689	1.9700e-003	0.0416	2.0100e-003	0.0436	0.0114	1.9200e-003	0.0133	0.0000	213.3405	213.3405	0.0401	0.0000	214.3422
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Worker	7.1000e-004	4.3000e-004	5.1200e-003	2.0000e-005	2.0900e-003	2.0000e-005	2.1000e-003	5.5000e-004	1.0000e-005	5.7000e-004	0.0000	1.8408	1.8408	4.0000e-005	0.0000	1.8417
Total	**0.0186**	**0.7363**	**0.2740**	**1.9900e-003**	**0.0436**	**2.0300e-003**	**0.0457**	**0.0120**	**1.9300e-003**	**0.0139**	**0.0000**	**215.1813**	**215.1813**	**0.0401**	**0.0000**	**216.1839**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.3900e-003	0.0000	2.3900e-003	2.6000e-004	0.0000	2.6000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.9300e-003	0.0430	0.3914	8.1000e-004		1.3200e-003	1.3200e-003		1.3200e-003	1.3200e-003	0.0000	71.1052	71.1052	0.0230	0.0000	71.6801
Total	**9.9300e-003**	**0.0430**	**0.3914**	**8.1000e-004**	**2.3900e-003**	**1.3200e-003**	**3.7100e-003**	**2.6000e-004**	**1.3200e-003**	**1.5800e-003**	**0.0000**	**71.1052**	**71.1052**	**0.0230**	**0.0000**	**71.6801**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0179	0.7358	0.2689	1.9700e-003	0.0416	2.0100e-003	0.0436	0.0114	1.9200e-003	0.0133	0.0000	213.3405	213.3405	0.0401	0.0000	214.3422
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.1000e-004	4.3000e-004	5.1200e-003	2.0000e-005	2.0900e-003	2.0000e-005	2.1000e-003	5.5000e-004	1.0000e-005	5.7000e-004	0.0000	1.8408	1.8408	4.0000e-005	0.0000	1.8417
Total	**0.0186**	**0.7363**	**0.2740**	**1.9900e-003**	**0.0436**	**2.0300e-003**	**0.0457**	**0.0120**	**1.9300e-003**	**0.0139**	**0.0000**	**215.1813**	**215.1813**	**0.0401**	**0.0000**	**216.1839**

3.4 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.6651	0.0000	0.6651	0.3633	0.0000	0.3633	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1687	1.8597	1.0096	2.2600e-003		0.0813	0.0813		0.0748	0.0748	0.0000	198.2247	198.2247	0.0641	0.0000	199.8275
Total	**0.1687**	**1.8597**	**1.0096**	**2.2600e-003**	**0.6651**	**0.0813**	**0.7463**	**0.3633**	**0.0748**	**0.4380**	**0.0000**	**198.2247**	**198.2247**	**0.0641**	**0.0000**	**199.8275**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0123	0.5080	0.1856	1.3600e-003	0.0287	1.3900e-003	0.0301	7.8700e-003	1.3300e-003	9.2000e-003	0.0000	147.2799	147.2799	0.0277	0.0000	147.9714
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9400e-003	1.8000e-003	0.0212	8.0000e-005	8.6500e-003	6.0000e-005	8.7200e-003	2.3000e-003	6.0000e-005	2.3600e-003	0.0000	7.6353	7.6353	1.5000e-004	0.0000	7.6390
Total	**0.0153**	**0.5098**	**0.2069**	**1.4400e-003**	**0.0373**	**1.4500e-003**	**0.0388**	**0.0102**	**1.3900e-003**	**0.0116**	**0.0000**	**154.9151**	**154.9151**	**0.0278**	**0.0000**	**155.6104**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Fugitive Dust					0.6651	0.0000	0.6651	0.3633	0.0000	0.3633	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0276	0.1196	1.1943	2.2600e-003		3.6800e-003	3.6800e-003		3.6800e-003	3.6800e-003	0.0000	198.2245	198.2245	0.0641	0.0000	199.8272
Total	**0.0276**	**0.1196**	**1.1943**	**2.2600e-003**	**0.6651**	**3.6800e-003**	**0.6687**	**0.3633**	**3.6800e-003**	**0.3669**	**0.0000**	**198.2245**	**198.2245**	**0.0641**	**0.0000**	**199.8272**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0123	0.5080	0.1856	1.3600e-003	0.0287	1.3900e-003	0.0301	7.8700e-003	1.3300e-003	9.2000e-003	0.0000	147.2799	147.2799	0.0277	0.0000	147.9714
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9400e-003	1.8000e-003	0.0212	8.0000e-005	8.6500e-003	6.0000e-005	8.7200e-003	2.3000e-003	6.0000e-005	2.3600e-003	0.0000	7.6353	7.6353	1.5000e-004	0.0000	7.6390
Total	**0.0153**	**0.5098**	**0.2069**	**1.4400e-003**	**0.0373**	**1.4500e-003**	**0.0388**	**0.0102**	**1.3900e-003**	**0.0116**	**0.0000**	**154.9151**	**154.9151**	**0.0278**	**0.0000**	**155.6104**

3.5 Draiange/Utilities/Subgrade - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total					**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Foundations/Concrete Pour - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0204	0.1606	0.1579	2.8000e-004		7.7200e-003	7.7200e-003		7.4000e-003	7.4000e-003	0.0000	22.8448	22.8448	4.4100e-003	0.0000	22.9550
Total	**0.0204**	**0.1606**	**0.1579**	**2.8000e-004**		**7.7200e-003**	**7.7200e-003**		**7.4000e-003**	**7.4000e-003**	**0.0000**	**22.8448**	**22.8448**	**4.4100e-003**	**0.0000**	**22.9550**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3800e-003	0.0525	0.0166	1.3000e-004	3.1600e-003	1.1000e-004	3.2700e-003	9.1000e-004	1.1000e-004	1.0200e-003	0.0000	13.0525	13.0525	1.7300e-003	0.0000	13.0958
Worker	2.5400e-003	1.5500e-003	0.0183	7.0000e-005	7.4800e-003	6.0000e-005	7.5300e-003	1.9900e-003	5.0000e-005	2.0400e-003	0.0000	6.5963	6.5963	1.3000e-004	0.0000	6.5995
Total	**3.9200e-003**	**0.0541**	**0.0350**	**2.0000e-004**	**0.0106**	**1.7000e-004**	**0.0108**	**2.9000e-003**	**1.6000e-004**	**3.0600e-003**	**0.0000**	**19.6489**	**19.6489**	**1.8600e-003**	**0.0000**	**19.6953**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.6300e-003	0.0426	0.1643	2.8000e-004		3.9000e-004	3.9000e-004		3.9000e-004	3.9000e-004	0.0000	22.8448	22.8448	4.4100e-003	0.0000	22.9550
Total	**3.6300e-003**	**0.0426**	**0.1643**	**2.8000e-004**		**3.9000e-004**	**3.9000e-004**		**3.9000e-004**	**3.9000e-004**	**0.0000**	**22.8448**	**22.8448**	**4.4100e-003**	**0.0000**	**22.9550**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3800e-003	0.0525	0.0166	1.3000e-004	3.1600e-003	1.1000e-004	3.2700e-003	9.1000e-004	1.1000e-004	1.0200e-003	0.0000	13.0525	13.0525	1.7300e-003	0.0000	13.0958
Worker	2.5400e-003	1.5500e-003	0.0183	7.0000e-005	7.4800e-003	6.0000e-005	7.5300e-003	1.9900e-003	5.0000e-005	2.0400e-003	0.0000	6.5963	6.5963	1.3000e-004	0.0000	6.5995
Total	**3.9200e-003**	**0.0541**	**0.0350**	**2.0000e-004**	**0.0106**	**1.7000e-004**	**0.0108**	**2.9000e-003**	**1.6000e-004**	**3.0600e-003**	**0.0000**	**19.6489**	**19.6489**	**1.8600e-003**	**0.0000**	**19.6953**

3.6 Foundations/Concrete Pour - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0925	0.7357	0.7676	1.3500e-003		0.0331	0.0331		0.0318	0.0318	0.0000	112.1591	112.1591	0.0212	0.0000	112.6894
Total	**0.0925**	**0.7357**	**0.7676**	**1.3500e-003**		**0.0331**	**0.0331**		**0.0318**	**0.0318**	**0.0000**	**112.1591**	**112.1591**	**0.0212**	**0.0000**	**112.6894**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.4800e-003	0.2138	0.0788	6.0000e-004	0.0155	3.1000e-004	0.0158	4.4900e-003	2.9000e-004	4.7800e-003	0.0000	62.4840	62.4840	8.3100e-003	0.0000	62.6916

Worker	0.0118	6.9100e-003	0.0840	3.4000e-004	0.0367	2.7000e-004	0.0370	9.7600e-003	2.5000e-004	0.0100	0.0000	31.1312	31.1312	5.7000e-004	0.0000	31.1454
Total	**0.0173**	**0.2207**	**0.1628**	**9.4000e-004**	**0.0522**	**5.8000e-004**	**0.0528**	**0.0143**	**5.4000e-004**	**0.0148**	**0.0000**	**93.6152**	**93.6152**	**8.8800e-003**	**0.0000**	**93.8370**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0178	0.2090	0.8065	1.3500e-003		1.9000e-003	1.9000e-003		1.9000e-003	1.9000e-003	0.0000	112.1590	112.1590	0.0212	0.0000	112.6893
Total	**0.0178**	**0.2090**	**0.8065**	**1.3500e-003**		**1.9000e-003**	**1.9000e-003**		**1.9000e-003**	**1.9000e-003**	**0.0000**	**112.1590**	**112.1590**	**0.0212**	**0.0000**	**112.6893**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.4800e-003	0.2138	0.0788	6.0000e-004	0.0155	3.1000e-004	0.0158	4.4900e-003	2.9000e-004	4.7800e-003	0.0000	62.4840	62.4840	8.3100e-003	0.0000	62.6916
Worker	0.0118	6.9100e-003	0.0840	3.4000e-004	0.0367	2.7000e-004	0.0370	9.7600e-003	2.5000e-004	0.0100	0.0000	31.1312	31.1312	5.7000e-004	0.0000	31.1454
Total	**0.0173**	**0.2207**	**0.1628**	**9.4000e-004**	**0.0522**	**5.8000e-004**	**0.0528**	**0.0143**	**5.4000e-004**	**0.0148**	**0.0000**	**93.6152**	**93.6152**	**8.8800e-003**	**0.0000**	**93.8370**

3.7 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1302	1.0354	1.0803	1.9000e-003		0.0466	0.0466		0.0447	0.0447	0.0000	157.8536	157.8536	0.0299	0.0000	158.5999
Total	**0.1302**	**1.0354**	**1.0803**	**1.9000e-003**		**0.0466**	**0.0466**		**0.0447**	**0.0447**	**0.0000**	**157.8536**	**157.8536**	**0.0299**	**0.0000**	**158.5999**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.7100e-003	0.3009	0.1109	8.5000e-004	0.0219	4.3000e-004	0.0223	6.3200e-003	4.1000e-004	6.7300e-003	0.0000	87.9404	87.9404	0.0117	0.0000	88.2326
Worker	0.0166	9.7300e-003	0.1183	4.8000e-004	0.0517	3.8000e-004	0.0520	0.0137	3.5000e-004	0.0141	0.0000	43.8143	43.8143	8.0000e-004	0.0000	43.8342
Total	**0.0243**	**0.3106**	**0.2291**	**1.3300e-003**	**0.0735**	**8.1000e-004**	**0.0743**	**0.0201**	**7.6000e-004**	**0.0208**	**0.0000**	**131.7547**	**131.7547**	**0.0125**	**0.0000**	**132.0668**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Off-Road	0.0251	0.2942	1.1351	1.9000e-003		2.6700e-003	2.6700e-003		2.6700e-003	2.6700e-003	0.0000	157.8534	157.8534	0.0299	0.0000	158.5997
Total	**0.0251**	**0.2942**	**1.1351**	**1.9000e-003**		**2.6700e-003**	**2.6700e-003**		**2.6700e-003**	**2.6700e-003**	**0.0000**	**157.8534**	**157.8534**	**0.0299**	**0.0000**	**158.5997**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.7100e-003	0.3009	0.1109	8.5000e-004	0.0219	4.3000e-004	0.0223	6.3200e-003	4.1000e-004	6.7300e-003	0.0000	87.9404	87.9404	0.0117	0.0000	88.2326
Worker	0.0166	9.7300e-003	0.1183	4.8000e-004	0.0517	3.8000e-004	0.0520	0.0137	3.5000e-004	0.0141	0.0000	43.8143	43.8143	8.0000e-004	0.0000	43.8342
Total	**0.0243**	**0.3106**	**0.2291**	**1.3300e-003**	**0.0735**	**8.1000e-004**	**0.0743**	**0.0201**	**7.6000e-004**	**0.0208**	**0.0000**	**131.7547**	**131.7547**	**0.0125**	**0.0000**	**132.0668**

3.7 Building Construction - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2092	1.6799	1.8471	3.2800e-003		0.0705	0.0705		0.0675	0.0675	0.0000	272.1052	272.1052	0.0507	0.0000	273.3722
Total	**0.2092**	**1.6799**	**1.8471**	**3.2800e-003**		**0.0705**	**0.0705**		**0.0675**	**0.0675**	**0.0000**	**272.1052**	**272.1052**	**0.0507**	**0.0000**	**273.3722**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0127	0.5059	0.1891	1.4400e-003	0.0377	7.1000e-004	0.0384	0.0109	6.8000e-004	0.0116	0.0000	150.1753	150.1753	0.0201	0.0000	150.6783
Worker	0.0272	0.0153	0.1910	8.0000e-004	0.0890	6.5000e-004	0.0897	0.0237	6.0000e-004	0.0243	0.0000	72.5154	72.5154	1.2500e-003	0.0000	72.5465
Total	**0.0399**	**0.5212**	**0.3801**	**2.2400e-003**	**0.1267**	**1.3600e-003**	**0.1281**	**0.0346**	**1.2800e-003**	**0.0359**	**0.0000**	**222.6906**	**222.6906**	**0.0214**	**0.0000**	**223.2248**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0432	0.5070	1.9566	3.2800e-003		4.6100e-003	4.6100e-003		4.6100e-003	4.6100e-003	0.0000	272.1049	272.1049	0.0507	0.0000	273.3719
Total	**0.0432**	**0.5070**	**1.9566**	**3.2800e-003**		**4.6100e-003**	**4.6100e-003**		**4.6100e-003**	**4.6100e-003**	**0.0000**	**272.1049**	**272.1049**	**0.0507**	**0.0000**	**273.3719**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0127	0.5059	0.1891	1.4400e-003	0.0377	7.1000e-004	0.0384	0.0109	6.8000e-004	0.0116	0.0000	150.1753	150.1753	0.0201	0.0000	150.6783
Worker	0.0272	0.0153	0.1910	8.0000e-004	0.0890	6.5000e-004	0.0897	0.0237	6.0000e-004	0.0243	0.0000	72.5154	72.5154	1.2500e-003	0.0000	72.5465
Total	**0.0399**	**0.5212**	**0.3801**	**2.2400e-003**	**0.1267**	**1.3600e-003**	**0.1281**	**0.0346**	**1.2800e-003**	**0.0359**	**0.0000**	**222.6906**	**222.6906**	**0.0214**	**0.0000**	**223.2248**

3.7 Building Construction - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1944	1.5690	1.8279	3.2700e-003		0.0613	0.0613		0.0587	0.0587	0.0000	271.0946	271.0946	0.0497	0.0000	272.3375
Total	**0.1944**	**1.5690**	**1.8279**	**3.2700e-003**		**0.0613**	**0.0613**		**0.0587**	**0.0587**	**0.0000**	**271.0946**	**271.0946**	**0.0497**	**0.0000**	**272.3375**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0122	0.4917	0.1887	1.4200e-003	0.0375	6.8000e-004	0.0382	0.0109	6.5000e-004	0.0115	0.0000	148.2324	148.2324	0.0200	0.0000	148.7334
Worker	0.0259	0.0139	0.1778	7.7000e-004	0.0887	6.4000e-004	0.0893	0.0236	5.9000e-004	0.0242	0.0000	69.2838	69.2838	1.1300e-003	0.0000	69.3121
Total	**0.0381**	**0.5056**	**0.3664**	**2.1900e-003**	**0.1262**	**1.3200e-003**	**0.1275**	**0.0344**	**1.2400e-003**	**0.0357**	**0.0000**	**217.5162**	**217.5162**	**0.0212**	**0.0000**	**218.0456**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0430	0.5051	1.9491	3.2700e-003		4.5900e-003	4.5900e-003		4.5900e-003	4.5900e-003	0.0000	271.0943	271.0943	0.0497	0.0000	272.3372
Total	**0.0430**	**0.5051**	**1.9491**	**3.2700e-003**		**4.5900e-003**	**4.5900e-003**		**4.5900e-003**	**4.5900e-003**	**0.0000**	**271.0943**	**271.0943**	**0.0497**	**0.0000**	**272.3372**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0122	0.4917	0.1887	1.4200e-003	0.0375	6.8000e-004	0.0382	0.0109	6.5000e-004	0.0115	0.0000	148.2324	148.2324	0.0200	0.0000	148.7334
Worker	0.0259	0.0139	0.1778	7.7000e-004	0.0887	6.4000e-004	0.0893	0.0236	5.9000e-004	0.0242	0.0000	69.2838	69.2838	1.1300e-003	0.0000	69.3121

Total	**0.0381**	**0.5056**	**0.3664**	**2.1900e-003**	**0.1262**	**1.3200e-003**	**0.1275**	**0.0344**	**1.2400e-003**	**0.0357**	**0.0000**	**217.5162**	**217.5162**	**0.0212**	**0.0000**	**218.0456**

3.8 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.7053					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0237	0.1597	0.2371	3.9000e-004		7.9800e-003	7.9800e-003		7.9800e-003	7.9800e-003	0.0000	33.4476	33.4476	1.8800e-003	0.0000	33.4947
Total	**0.7290**	**0.1597**	**0.2371**	**3.9000e-004**		**7.9800e-003**	**7.9800e-003**		**7.9800e-003**	**7.9800e-003**	**0.0000**	**33.4476**	**33.4476**	**1.8800e-003**	**0.0000**	**33.4947**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.3800e-003	3.0200e-003	0.0378	1.6000e-004	0.0176	1.3000e-004	0.0177	4.6800e-003	1.2000e-004	4.8000e-003	0.0000	14.3344	14.3344	2.5000e-004	0.0000	14.3406
Total	**5.3800e-003**	**3.0200e-003**	**0.0378**	**1.6000e-004**	**0.0176**	**1.3000e-004**	**0.0177**	**4.6800e-003**	**1.2000e-004**	**4.8000e-003**	**0.0000**	**14.3344**	**14.3344**	**2.5000e-004**	**0.0000**	**14.3406**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.7053					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.8900e-003	0.0169	0.2401	3.9000e-004		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	33.4476	33.4476	1.8800e-003	0.0000	33.4947
Total	**0.7092**	**0.0169**	**0.2401**	**3.9000e-004**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**	**0.0000**	**33.4476**	**33.4476**	**1.8800e-003**	**0.0000**	**33.4947**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.3800e-003	3.0200e-003	0.0378	1.6000e-004	0.0176	1.3000e-004	0.0177	4.6800e-003	1.2000e-004	4.8000e-003	0.0000	14.3344	14.3344	2.5000e-004	0.0000	14.3406
Total	**5.3800e-003**	**3.0200e-003**	**0.0378**	**1.6000e-004**	**0.0176**	**1.3000e-004**	**0.0177**	**4.6800e-003**	**1.2000e-004**	**4.8000e-003**	**0.0000**	**14.3344**	**14.3344**	**2.5000e-004**	**0.0000**	**14.3406**

3.8 Architectural Coating - 2025

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Archit. Coating	0.7026					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0223	0.1495	0.2361	3.9000e-004		6.7200e-003	6.7200e-003		6.7200e-003	6.7200e-003	0.0000	33.3200	33.3200	1.8200e-003	0.0000	33.3654
Total	**0.7249**	**0.1495**	**0.2361**	**3.9000e-004**		**6.7200e-003**	**6.7200e-003**		**6.7200e-003**	**6.7200e-003**	**0.0000**	**33.3200**	**33.3200**	**1.8200e-003**	**0.0000**	**33.3654**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1200e-003	2.7500e-003	0.0351	1.5000e-004	0.0175	1.3000e-004	0.0177	4.6600e-003	1.2000e-004	4.7800e-003	0.0000	13.6956	13.6956	2.2000e-004	0.0000	13.7012
Total	**5.1200e-003**	**2.7500e-003**	**0.0351**	**1.5000e-004**	**0.0175**	**1.3000e-004**	**0.0177**	**4.6600e-003**	**1.2000e-004**	**4.7800e-003**	**0.0000**	**13.6956**	**13.6956**	**2.2000e-004**	**0.0000**	**13.7012**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.7026					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.8800e-003	0.0168	0.2391	3.9000e-004		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	33.3199	33.3199	1.8200e-003	0.0000	33.3654
Total	**0.7065**	**0.0168**	**0.2391**	**3.9000e-004**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**	**0.0000**	**33.3199**	**33.3199**	**1.8200e-003**	**0.0000**	**33.3654**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1200e-003	2.7500e-003	0.0351	1.5000e-004	0.0175	1.3000e-004	0.0177	4.6600e-003	1.2000e-004	4.7800e-003	0.0000	13.6956	13.6956	2.2000e-004	0.0000	13.7012
Total	**5.1200e-003**	**2.7500e-003**	**0.0351**	**1.5000e-004**	**0.0175**	**1.3000e-004**	**0.0177**	**4.6600e-003**	**1.2000e-004**	**4.7800e-003**	**0.0000**	**13.6956**	**13.6956**	**2.2000e-004**	**0.0000**	**13.7012**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Research & Development	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Research & Development	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Research & Development	0.603873	0.037286	0.192865	0.090708	0.013128	0.005155	0.032618	0.009408	0.004276	0.003135	0.006045	0.000953	0.000549

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Research & Development	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Research & Development	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e

Land Use	kWh/yr	MT/yr			
Research & Development	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Research & Development	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Mitigated	0.1410	2.0000e-005	2.4700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8200e-003	4.8200e-003	1.0000e-005	0.0000	5.1400e-003
Unmitigated	0.1410	2.0000e-005	2.4700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8200e-003	4.8200e-003	1.0000e-005	0.0000	5.1400e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1408					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.3000e-004	2.0000e-005	2.4700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8200e-003	4.8200e-003	1.0000e-005	0.0000	5.1400e-003
Total	**0.1410**	**2.0000e-005**	**2.4700e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.8200e-003**	**4.8200e-003**	**1.0000e-005**	**0.0000**	**5.1400e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1408					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.3000e-004	2.0000e-005	2.4700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8200e-003	4.8200e-003	1.0000e-005	0.0000	5.1400e-003

Total	**0.1410**	**2.0000e-005**	**2.4700e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.8200e-003**	**4.8200e-003**	**1.0000e-005**	**0.0000**	**5.1400e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Research & Development	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Research & Development	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Research & Development	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Research & Development	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Land Use	kWh/yr	MT/yr			
Research & Development	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1410	2.0000e-005	2.4700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8200e-003	4.8200e-003	1.0000e-005	0.0000	5.1400e-003
Unmitigated	0.1410	2.0000e-005	2.4700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8200e-003	4.8200e-003	1.0000e-005	0.0000	5.1400e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1408					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.3000e-004	2.0000e-005	2.4700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8200e-003	4.8200e-003	1.0000e-005	0.0000	5.1400e-003
Total	**0.1410**	**2.0000e-005**	**2.4700e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.8200e-003**	**4.8200e-003**	**1.0000e-005**	**0.0000**	**5.1400e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1408					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.3000e-004	2.0000e-005	2.4700e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8200e-003	4.8200e-003	1.0000e-005	0.0000	5.1400e-003
Total	**0.1410**	**2.0000e-005**	**2.4700e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.8200e-003**	**4.8200e-003**	**1.0000e-005**	**0.0000**	**5.1400e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Research & Development	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Research & Development	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Research & Development	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

Research & Development	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Construction Emissions Summary for Initial Phase Projects and the Hospital

Unmitigated Emissions

Year	Average daily emissions (lbs/day)			
	ROG	Nox	PM10	PM2.5
2022	3.95	50.65	1.70	1.58
2023	2.70	24.47	0.95	0.89
2024	9.75	50.80	1.42	1.34
2025	9.90	42.91	1.04	1.00
2026	4.98	50.98	1.01	0.96
2027	2.45	25.15	0.50	0.48
2028	21.74	25.96	0.55	0.53
2029	30.72	25.81	0.56	0.53

Mitigated Emissions (all Projects)

Year	Average daily emissions (lbs/day)			
	ROG	Nox	PM10	PM2.5
2022	1.07	16.82	0.12	0.12
2023	0.83	8.91	0.07	0.06
2024	6.45	18.49	0.08	0.09
2025	7.44	25.59	0.12	0.12
2026	2.66	34.68	0.14	0.14
2027	1.29	17.00	0.07	0.07
2028	22.03	22.18	0.12	0.11
2029	29.42	16.61	0.07	0.07

Mitigated Emissions (RAB and Aldea Only)

Year	Average daily emissions (lbs/year)			
	ROG	Nox	PM10	PM2.5
2021	0.00	0.00	0.00	0.00
2022	1.76	24.71	0.52	0.49
2023	1.32	14.75	0.37	0.34
2024	8.33	40.76	0.86	0.80
2025	8.60	33.74	0.56	0.53
2026	4.98	50.98	1.01	0.96
2027	2.45	25.15	0.50	0.48
2028	23.33	31.31	0.60	0.57
2029	29.42	16.61	0.07	0.07

Calculation of average daily emissions from annual emission output from CalEEMod - ISA

UNMITIGATED EMISSIONS

		Annual Emissions (TPY)				Average Daily Emissions (lb/day)			
Year	Work days	ROG	Nox	PM10	PM2.5	ROG	Nox	PM10	PM2.5
2022	219	0.0994	1.0016	0.0458	0.0427	0.91	9.15	0.42	0.39
2023	239	0.0807	0.8153	0.0386	0.0355	0.68	6.82	0.32	0.30

MITIGATED EMISSIONS

		Annual Emissions (TPY)				Average Daily Emissions (lb/day)			
Year	Work days	ROG	Nox	PM10	PM2.5	ROG	Nox	PM10	PM2.5
2022	219	0.0237	0.1386	2.65E-03	2.63E-03	0.22	1.27	0.02	0.02
2023	239	0.0214	0.1176	2.37E-03	2.36E-03	0.18	0.98	0.02	0.02

Calculation of average daily emissions from annual emission output from CalEEMod - RAB

UNMITIGATED EMISSIONS

		Annual Emissions (TPY)				Average Daily Emissions (lb/day)			
Year	Work days	ROG	Nox	PM10	PM2.5	ROG	Nox	PM10	PM2.5
2022	219	0.3331	4.5442	0.1404	0.13	3.04	41.50	1.28	1.19
2023	261	0.2644	2.3024	0.0812	0.0778	2.03	17.64	0.62	0.60
2024	262	0.9835	2.3637	0.0800	0.0769	7.51	18.04	0.61	0.59
2025	261	0.9625	2.2269	0.0695	0.0668	7.38	17.06	0.53	0.51

MITIGATED EMISSIONS

		Annual Emissions (TPY)				Average Daily Emissions (lb/day)			
Year	Work days	ROG	Nox	PM10	PM2.5	ROG	Nox	PM10	PM2.5
2022	219	0.0932	1.7037	0.0107	0.0105	0.85	15.56	0.10	0.10
2023	261	0.0845	1.0345	5.96E-03	5.88E-03	0.65	7.93	0.05	0.05
2024	262	0.7977	1.0481	6.62E-03	6.52E-03	6.09	8.00	0.05	0.05
2025	261	0.7927	1.0303	6.56E-03	6.47E-03	6.07	7.90	0.05	0.05

Calculation of average daily emissions from annual emission output from CalEEMod - Aldea

		Annual Emissions (TPY)				Average Daily Emissions (lb/day)			
Year	Work days	ROG	Nox	PM10	PM2.5	ROG	Nox	PM10	PM2.5
2028	261	0.352	1.7937	0.0621	0.0591	2.70	13.74	0.48	0.45
2029	8	1.1667	5.26E-03	2.40E-04	2.40E-04	291.68	1.32	0.06	0.06

MITIGATED EMISSIONS

		Annual Emissions (TPY)				Average Daily Emissions (lb/day)			
Year	Work days	ROG	Nox	PM10	PM2.5	ROG	Nox	PM10	PM2.5
2028	261	0.2068	0.6984	5.62E-03	5.50E-03	1.58	5.35	0.04	0.04
2029	8	1.1661	6.90E-04	2.00E-05	2.00E-05	291.53	0.17	0.01	0.01

Calculation of average daily emissions from annual emission output from CalEEMod - New Hospital

UPDATED For No Demolition which was in the 2014 LRDP for LPPI

UNMITIGATED EMISSIONS

		Annual Emissions (TPY)				Average Daily Emissions (lb/day)			
Year	Work days	ROG	Nox	PM10	PM2.5	ROG	Nox	PM10	PM2.5
2024	262	0.2932	4.2909	0.1064	0.0981	2.24	32.75	0.81	0.75
2025	261	0.3301	3.3730	0.0660	0.0631	2.53	25.85	0.51	0.48
2026	261	0.6503	6.6532	0.1317	0.1259	4.98	50.98	1.01	0.96
2027	261	0.3203	3.2825	0.0657	0.0628	2.45	25.15	0.50	0.48
2028	261	2.8376	3.3881	0.0722	0.0693	21.74	25.96	0.55	0.53
2029	261	2.8428	3.3630	0.0723	0.0694	21.78	25.77	0.55	0.53

MITIGATED EMISSIONS

		Annual Emissions (TPY)				Average Daily Emissions (lb/day)			
Year	Work days	ROG	Nox	PM10	PM2.5	ROG	Nox	PM10	PM2.5
2024	262	0.0477	1.3746	0.004256	0.004905	0.36	10.49	0.03	0.04
2025	261	0.1787	2.309	9.30E-03	9.01E-03	1.37	17.69	0.07	0.07
2026	261	0.3475	4.5253	0.0183	0.0177	2.66	34.68	0.14	0.14
2027	261	0.1689	2.2186	8.92E-03	8.65E-03	1.29	17.00	0.07	0.07
2028	261	2.6685	2.196	9.54E-03	9.26E-03	20.45	16.83	0.07	0.07
2029	261	2.673	2.1663	9.32E-03	9.05E-03	20.48	16.60	0.07	0.07

CalEEmod Outputs Existing Operation

CPHP Operational Existing

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Hospital	3,900.00	1000sqft	89.53	3,900,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2019
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - UCSF Net zero GHG electricity starting in 2025

Land Use - Operational Mobile source and area source only

Construction Phase - mobile source run only

Off-road Equipment - Operational Mobile Source Run only

Trips and VMT - Operational Run Only

Vehicle Trips - Trip rates adjusted to match daily VMT estimates of the Transportation Section

Vehicle Emission Factors - EMFAC 2017

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust - CARB Mthod 7.9

Woodstoves -

Consumer Products - SF specific ROG Factor

Energy Use - Net xero electricity. Natural gas separate through CUP

Solid Waste - Adjusted rate to campus-specific wate to landfill in 2018.

Table Name	Column Name	Default Value	New Value
tblConsumerProducts	ROG_EF	2.14E-05	1.51E-05
tblFleetMix	HHD	8.6010e-003	0.02
tblFleetMix	LDA	0.61	0.56
tblFleetMix	LDT1	0.04	0.06
tblFleetMix	LDT2	0.19	0.19
tblFleetMix	LHD1	0.02	0.02
tblFleetMix	LHD2	4.7930e-003	5.5750e-003
tblFleetMix	MCY	7.1780e-003	5.8190e-003
tblFleetMix	MDV	0.09	0.12
tblFleetMix	MH	4.4300e-004	8.1300e-004
tblFleetMix	MHD	0.03	0.02
tblFleetMix	OBUS	4.2620e-003	1.9390e-003
tblFleetMix	SBUS	9.2100e-004	7.5100e-004
tblFleetMix	UBUS	5.3150e-003	1.7020e-003
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblRoadDust	RoadSiltLoading	0.1	0.048
tblSolidWaste	SolidWasteGenerationRate	42,120.00	1,600.00
tblVehicleEF	HHD	0.88	0.03
tblVehicleEF	HHD	0.34	0.05
tblVehicleEF	HHD	0.17	0.00
tblVehicleEF	HHD	2.74	5.02

tblVehicleEF	HHD	1.98	0.89
tblVehicleEF	HHD	5.20	7.4690e-003
tblVehicleEF	HHD	3,291.35	1,047.62
tblVehicleEF	HHD	2,092.61	1,603.18
tblVehicleEF	HHD	13.79	0.11
tblVehicleEF	HHD	26.14	6.11
tblVehicleEF	HHD	6.24	5.16
tblVehicleEF	HHD	19.48	1.47
tblVehicleEF	HHD	0.06	0.02
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.03	0.04
tblVehicleEF	HHD	0.03	0.09
tblVehicleEF	HHD	3.9900e-004	4.0000e-006
tblVehicleEF	HHD	0.05	0.02
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.5420e-003	8.8600e-003
tblVehicleEF	HHD	0.03	0.09
tblVehicleEF	HHD	3.7600e-004	4.0000e-006
tblVehicleEF	HHD	1.7000e-004	7.0000e-006
tblVehicleEF	HHD	0.01	5.1200e-004
tblVehicleEF	HHD	0.64	0.45
tblVehicleEF	HHD	1.0900e-004	4.0000e-006
tblVehicleEF	HHD	0.16	0.22
tblVehicleEF	HHD	2.3370e-003	2.4610e-003
tblVehicleEF	HHD	0.20	2.0000e-006
tblVehicleEF	HHD	0.03	9.7610e-003
tblVehicleEF	HHD	0.02	0.01
tblVehicleEF	HHD	2.2600e-004	1.0000e-006
tblVehicleEF	HHD	1.7000e-004	7.0000e-006
tblVehicleEF	HHD	0.01	5.1200e-004

tblVehicleEF	HHD	0.77	0.51
tblVehicleEF	HHD	1.0900e-004	4.0000e-006
tblVehicleEF	HHD	0.52	0.29
tblVehicleEF	HHD	2.3370e-003	2.4610e-003
tblVehicleEF	HHD	0.22	3.0000e-006
tblVehicleEF	LDA	6.0130e-003	3.7600e-003
tblVehicleEF	LDA	8.5520e-003	0.07
tblVehicleEF	LDA	0.68	0.83
tblVehicleEF	LDA	1.69	2.52
tblVehicleEF	LDA	306.89	276.87
tblVehicleEF	LDA	63.06	58.32
tblVehicleEF	LDA	0.06	0.06
tblVehicleEF	LDA	0.11	0.25
tblVehicleEF	LDA	2.2590e-003	1.7090e-003
tblVehicleEF	LDA	2.3350e-003	2.0840e-003
tblVehicleEF	LDA	2.0830e-003	1.5760e-003
tblVehicleEF	LDA	2.1470e-003	1.9160e-003
tblVehicleEF	LDA	0.03	0.05
tblVehicleEF	LDA	0.12	0.13
tblVehicleEF	LDA	0.03	0.05
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.05	0.26
tblVehicleEF	LDA	0.12	0.34
tblVehicleEF	LDA	3.0730e-003	2.7390e-003
tblVehicleEF	LDA	6.6000e-004	5.7700e-004
tblVehicleEF	LDA	0.03	0.05
tblVehicleEF	LDA	0.12	0.13
tblVehicleEF	LDA	0.03	0.05
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	0.05	0.26

tblVehicleEF	LDA	0.13	0.37
tblVehicleEF	LDT1	0.01	7.8640e-003
tblVehicleEF	LDT1	0.02	0.10
tblVehicleEF	LDT1	1.15	1.52
tblVehicleEF	LDT1	3.13	2.80
tblVehicleEF	LDT1	367.18	327.08
tblVehicleEF	LDT1	75.56	69.98
tblVehicleEF	LDT1	0.11	0.15
tblVehicleEF	LDT1	0.18	0.34
tblVehicleEF	LDT1	2.6500e-003	2.4420e-003
tblVehicleEF	LDT1	3.0170e-003	3.0100e-003
tblVehicleEF	LDT1	2.4400e-003	2.2490e-003
tblVehicleEF	LDT1	2.7750e-003	2.7690e-003
tblVehicleEF	LDT1	0.07	0.12
tblVehicleEF	LDT1	0.23	0.24
tblVehicleEF	LDT1	0.07	0.09
tblVehicleEF	LDT1	0.03	0.04
tblVehicleEF	LDT1	0.17	0.87
tblVehicleEF	LDT1	0.22	0.51
tblVehicleEF	LDT1	3.6840e-003	3.2370e-003
tblVehicleEF	LDT1	8.1100e-004	6.9200e-004
tblVehicleEF	LDT1	0.07	0.12
tblVehicleEF	LDT1	0.23	0.24
tblVehicleEF	LDT1	0.07	0.09
tblVehicleEF	LDT1	0.04	0.05
tblVehicleEF	LDT1	0.17	0.87
tblVehicleEF	LDT1	0.24	0.56
tblVehicleEF	LDT2	7.3050e-003	5.0180e-003
tblVehicleEF	LDT2	9.3230e-003	0.09
tblVehicleEF	LDT2	0.82	1.06

tblVehicleEF	LDT2	1.93	3.23
tblVehicleEF	LDT2	416.26	360.96
tblVehicleEF	LDT2	85.96	77.32
tblVehicleEF	LDT2	0.09	0.11
tblVehicleEF	LDT2	0.17	0.39
tblVehicleEF	LDT2	2.0990e-003	1.6310e-003
tblVehicleEF	LDT2	2.1870e-003	1.9980e-003
tblVehicleEF	LDT2	1.9300e-003	1.5010e-003
tblVehicleEF	LDT2	2.0110e-003	1.8380e-003
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.02	0.02
tblVehicleEF	LDT2	0.07	0.47
tblVehicleEF	LDT2	0.13	0.43
tblVehicleEF	LDT2	4.1680e-003	3.5710e-003
tblVehicleEF	LDT2	8.9200e-004	7.6500e-004
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.11	0.14
tblVehicleEF	LDT2	0.04	0.06
tblVehicleEF	LDT2	0.03	0.03
tblVehicleEF	LDT2	0.07	0.47
tblVehicleEF	LDT2	0.14	0.47
tblVehicleEF	LHD1	7.2340e-003	5.6240e-003
tblVehicleEF	LHD1	0.02	0.01
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	0.17	0.19
tblVehicleEF	LHD1	1.03	1.18
tblVehicleEF	LHD1	3.13	1.25
tblVehicleEF	LHD1	8.69	9.26

tblVehicleEF	LHD1	739.64	843.69
tblVehicleEF	LHD1	40.42	12.62
tblVehicleEF	LHD1	0.06	0.07
tblVehicleEF	LHD1	0.91	1.32
tblVehicleEF	LHD1	1.28	0.37
tblVehicleEF	LHD1	6.4500e-004	8.1400e-004
tblVehicleEF	LHD1	9.5460e-003	9.6580e-003
tblVehicleEF	LHD1	0.01	0.01
tblVehicleEF	LHD1	1.0450e-003	3.2500e-004
tblVehicleEF	LHD1	6.1700e-004	7.7900e-004
tblVehicleEF	LHD1	2.3870e-003	2.4150e-003
tblVehicleEF	LHD1	0.01	0.01
tblVehicleEF	LHD1	9.6100e-004	3.0000e-004
tblVehicleEF	LHD1	2.0950e-003	2.2090e-003
tblVehicleEF	LHD1	0.10	0.09
tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.2880e-003	1.1400e-003
tblVehicleEF	LHD1	0.10	0.12
tblVehicleEF	LHD1	0.29	0.64
tblVehicleEF	LHD1	0.33	0.10
tblVehicleEF	LHD1	8.8000e-005	9.0000e-005
tblVehicleEF	LHD1	7.3010e-003	8.2440e-003
tblVehicleEF	LHD1	4.6400e-004	1.2500e-004
tblVehicleEF	LHD1	2.0950e-003	2.2090e-003
tblVehicleEF	LHD1	0.10	0.09
tblVehicleEF	LHD1	0.03	0.03
tblVehicleEF	LHD1	1.2880e-003	1.1400e-003
tblVehicleEF	LHD1	0.13	0.15
tblVehicleEF	LHD1	0.29	0.64
tblVehicleEF	LHD1	0.36	0.11

tblVehicleEF	LHD2	4.3820e-003	3.7550e-003
tblVehicleEF	LHD2	0.01	9.4180e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.13	0.15
tblVehicleEF	LHD2	0.71	0.84
tblVehicleEF	LHD2	1.77	0.80
tblVehicleEF	LHD2	13.95	14.30
tblVehicleEF	LHD2	737.62	829.16
tblVehicleEF	LHD2	27.42	9.07
tblVehicleEF	LHD2	0.11	0.11
tblVehicleEF	LHD2	0.90	1.46
tblVehicleEF	LHD2	0.63	0.23
tblVehicleEF	LHD2	1.3060e-003	1.3320e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	5.4500e-004	1.6600e-004
tblVehicleEF	LHD2	1.2490e-003	1.2750e-003
tblVehicleEF	LHD2	2.6600e-003	2.6540e-003
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	5.0100e-004	1.5300e-004
tblVehicleEF	LHD2	1.0000e-003	1.2560e-003
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	5.7600e-004	6.4600e-004
tblVehicleEF	LHD2	0.11	0.13
tblVehicleEF	LHD2	0.12	0.38
tblVehicleEF	LHD2	0.15	0.06
tblVehicleEF	LHD2	7.1860e-003	8.0200e-003
tblVehicleEF	LHD2	3.0600e-004	9.0000e-005
tblVehicleEF	LHD2	1.0000e-003	1.2560e-003

tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.02	0.02
tblVehicleEF	LHD2	5.7600e-004	6.4600e-004
tblVehicleEF	LHD2	0.13	0.15
tblVehicleEF	LHD2	0.12	0.38
tblVehicleEF	LHD2	0.17	0.07
tblVehicleEF	MCY	0.53	0.35
tblVehicleEF	MCY	0.17	0.27
tblVehicleEF	MCY	22.71	21.85
tblVehicleEF	MCY	10.09	8.98
tblVehicleEF	MCY	189.81	215.51
tblVehicleEF	MCY	47.84	63.26
tblVehicleEF	MCY	1.19	1.18
tblVehicleEF	MCY	0.32	0.27
tblVehicleEF	MCY	2.3420e-003	1.9050e-003
tblVehicleEF	MCY	5.3290e-003	3.6620e-003
tblVehicleEF	MCY	2.2010e-003	1.7880e-003
tblVehicleEF	MCY	5.0560e-003	3.4660e-003
tblVehicleEF	MCY	0.79	0.84
tblVehicleEF	MCY	0.87	0.78
tblVehicleEF	MCY	0.52	0.50
tblVehicleEF	MCY	2.95	2.45
tblVehicleEF	MCY	0.96	2.55
tblVehicleEF	MCY	2.35	2.05
tblVehicleEF	MCY	2.3560e-003	2.1330e-003
tblVehicleEF	MCY	7.1300e-004	6.2600e-004
tblVehicleEF	MCY	0.79	0.84
tblVehicleEF	MCY	0.87	0.78
tblVehicleEF	MCY	0.52	0.50
tblVehicleEF	MCY	3.58	2.98

tblVehicleEF	MCY	0.96	2.55
tblVehicleEF	MCY	2.56	2.23
tblVehicleEF	MDV	0.01	6.8920e-003
tblVehicleEF	MDV	0.02	0.11
tblVehicleEF	MDV	1.12	1.31
tblVehicleEF	MDV	2.84	3.93
tblVehicleEF	MDV	537.85	437.34
tblVehicleEF	MDV	108.44	93.47
tblVehicleEF	MDV	0.13	0.15
tblVehicleEF	MDV	0.25	0.49
tblVehicleEF	MDV	2.2800e-003	1.8450e-003
tblVehicleEF	MDV	2.3890e-003	2.3280e-003
tblVehicleEF	MDV	2.1030e-003	1.7030e-003
tblVehicleEF	MDV	2.1990e-003	2.1440e-003
tblVehicleEF	MDV	0.04	0.08
tblVehicleEF	MDV	0.13	0.17
tblVehicleEF	MDV	0.04	0.07
tblVehicleEF	MDV	0.03	0.03
tblVehicleEF	MDV	0.09	0.52
tblVehicleEF	MDV	0.22	0.58
tblVehicleEF	MDV	5.3820e-003	4.3240e-003
tblVehicleEF	MDV	1.1340e-003	9.2500e-004
tblVehicleEF	MDV	0.04	0.08
tblVehicleEF	MDV	0.13	0.17
tblVehicleEF	MDV	0.04	0.07
tblVehicleEF	MDV	0.04	0.05
tblVehicleEF	MDV	0.09	0.52
tblVehicleEF	MDV	0.24	0.63
tblVehicleEF	MH	0.05	0.02
tblVehicleEF	MH	0.04	0.03

tblVehicleEF	MH	4.05	2.38
tblVehicleEF	MH	7.99	2.58
tblVehicleEF	MH	1,210.75	1,622.44
tblVehicleEF	MH	62.93	20.92
tblVehicleEF	MH	1.23	1.73
tblVehicleEF	MH	0.92	0.25
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	2.0050e-003	3.8400e-004
tblVehicleEF	MH	3.2170e-003	3.2610e-003
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	1.8630e-003	3.5500e-004
tblVehicleEF	MH	0.76	0.91
tblVehicleEF	MH	0.08	0.08
tblVehicleEF	MH	0.31	0.32
tblVehicleEF	MH	0.16	0.12
tblVehicleEF	MH	0.02	1.94
tblVehicleEF	MH	0.48	0.13
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	7.6900e-004	2.0700e-004
tblVehicleEF	MH	0.76	0.91
tblVehicleEF	MH	0.08	0.08
tblVehicleEF	MH	0.31	0.32
tblVehicleEF	MH	0.21	0.16
tblVehicleEF	MH	0.02	1.94
tblVehicleEF	MH	0.53	0.14
tblVehicleEF	MHD	0.02	3.2750e-003
tblVehicleEF	MHD	0.01	0.02
tblVehicleEF	MHD	0.07	0.01
tblVehicleEF	MHD	0.48	0.37

tblVehicleEF	MHD	0.78	1.07
tblVehicleEF	MHD	7.89	1.29
tblVehicleEF	MHD	143.81	83.12
tblVehicleEF	MHD	1,211.17	1,188.32
tblVehicleEF	MHD	61.55	9.19
tblVehicleEF	MHD	1.03	0.83
tblVehicleEF	MHD	2.73	3.73
tblVehicleEF	MHD	10.79	0.99
tblVehicleEF	MHD	4.2200e-003	3.1980e-003
tblVehicleEF	MHD	0.07	0.11
tblVehicleEF	MHD	1.1080e-003	1.3700e-004
tblVehicleEF	MHD	4.0370e-003	3.0600e-003
tblVehicleEF	MHD	0.06	0.11
tblVehicleEF	MHD	1.0190e-003	1.2700e-004
tblVehicleEF	MHD	1.1130e-003	5.1600e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.04	0.02
tblVehicleEF	MHD	6.3700e-004	2.6500e-004
tblVehicleEF	MHD	0.17	0.28
tblVehicleEF	MHD	0.03	0.14
tblVehicleEF	MHD	0.49	0.06
tblVehicleEF	MHD	1.3850e-003	7.8800e-004
tblVehicleEF	MHD	0.01	0.01
tblVehicleEF	MHD	7.5400e-004	9.1000e-005
tblVehicleEF	MHD	1.1130e-003	5.1600e-004
tblVehicleEF	MHD	0.05	0.02
tblVehicleEF	MHD	0.05	0.03
tblVehicleEF	MHD	6.3700e-004	2.6500e-004
tblVehicleEF	MHD	0.20	0.32
tblVehicleEF	MHD	0.03	0.14

tblVehicleEF	MHD	0.53	0.06
tblVehicleEF	OBUS	0.01	8.4920e-003
tblVehicleEF	OBUS	0.01	0.02
tblVehicleEF	OBUS	0.03	0.02
tblVehicleEF	OBUS	0.30	0.58
tblVehicleEF	OBUS	0.72	1.35
tblVehicleEF	OBUS	6.00	2.35
tblVehicleEF	OBUS	135.90	100.08
tblVehicleEF	OBUS	1,345.54	1,492.82
tblVehicleEF	OBUS	67.08	18.05
tblVehicleEF	OBUS	0.92	0.77
tblVehicleEF	OBUS	2.92	2.84
tblVehicleEF	OBUS	3.50	0.71
tblVehicleEF	OBUS	5.0700e-004	4.2240e-003
tblVehicleEF	OBUS	0.01	0.07
tblVehicleEF	OBUS	6.2900e-004	1.7400e-004
tblVehicleEF	OBUS	4.8500e-004	4.0410e-003
tblVehicleEF	OBUS	0.01	0.06
tblVehicleEF	OBUS	5.8100e-004	1.6000e-004
tblVehicleEF	OBUS	1.0630e-003	1.1730e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.04	0.07
tblVehicleEF	OBUS	5.5500e-004	5.2900e-004
tblVehicleEF	OBUS	0.10	0.20
tblVehicleEF	OBUS	0.03	0.20
tblVehicleEF	OBUS	0.39	0.12
tblVehicleEF	OBUS	1.3080e-003	9.5100e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	7.7700e-004	1.7900e-004
tblVehicleEF	OBUS	1.0630e-003	1.1730e-003

tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.06	0.08
tblVehicleEF	OBUS	5.5500e-004	5.2900e-004
tblVehicleEF	OBUS	0.12	0.24
tblVehicleEF	OBUS	0.03	0.20
tblVehicleEF	OBUS	0.43	0.13
tblVehicleEF	SBUS	0.86	0.04
tblVehicleEF	SBUS	0.01	6.8040e-003
tblVehicleEF	SBUS	0.07	3.4700e-003
tblVehicleEF	SBUS	7.83	1.66
tblVehicleEF	SBUS	0.76	0.57
tblVehicleEF	SBUS	7.67	0.54
tblVehicleEF	SBUS	1,158.79	341.31
tblVehicleEF	SBUS	1,085.89	1,086.71
tblVehicleEF	SBUS	52.61	2.88
tblVehicleEF	SBUS	11.01	3.58
tblVehicleEF	SBUS	5.00	5.19
tblVehicleEF	SBUS	12.72	0.79
tblVehicleEF	SBUS	0.01	4.2240e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	5.3300e-004	3.5000e-005
tblVehicleEF	SBUS	0.01	4.0420e-003
tblVehicleEF	SBUS	2.6600e-003	2.7840e-003
tblVehicleEF	SBUS	0.03	0.03
tblVehicleEF	SBUS	4.9000e-004	3.2000e-005
tblVehicleEF	SBUS	2.0410e-003	3.3100e-004
tblVehicleEF	SBUS	0.02	3.4390e-003
tblVehicleEF	SBUS	0.94	0.18
tblVehicleEF	SBUS	1.0670e-003	1.2700e-004

tblVehicleEF	SBUS	0.11	0.09
tblVehicleEF	SBUS	0.01	0.03
tblVehicleEF	SBUS	0.40	0.02
tblVehicleEF	SBUS	0.01	3.2410e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	6.5900e-004	2.9000e-005
tblVehicleEF	SBUS	2.0410e-003	3.3100e-004
tblVehicleEF	SBUS	0.02	3.4390e-003
tblVehicleEF	SBUS	1.36	0.25
tblVehicleEF	SBUS	1.0670e-003	1.2700e-004
tblVehicleEF	SBUS	0.14	0.11
tblVehicleEF	SBUS	0.01	0.03
tblVehicleEF	SBUS	0.44	0.02
tblVehicleEF	UBUS	0.46	1.11
tblVehicleEF	UBUS	0.07	5.7840e-003
tblVehicleEF	UBUS	14.98	7.85
tblVehicleEF	UBUS	10.33	0.42
tblVehicleEF	UBUS	2,344.36	1,701.27
tblVehicleEF	UBUS	59.82	4.88
tblVehicleEF	UBUS	19.10	1.73
tblVehicleEF	UBUS	18.10	0.05
tblVehicleEF	UBUS	0.72	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.37	5.9870e-003
tblVehicleEF	UBUS	2.5020e-003	2.0000e-005
tblVehicleEF	UBUS	0.31	0.03
tblVehicleEF	UBUS	3.0000e-003	7.8890e-003
tblVehicleEF	UBUS	0.35	5.7270e-003
tblVehicleEF	UBUS	2.3570e-003	1.9000e-005
tblVehicleEF	UBUS	4.7670e-003	1.9700e-004

tblVehicleEF	UBUS	0.15	2.6620e-003
tblVehicleEF	UBUS	2.3580e-003	1.2100e-004
tblVehicleEF	UBUS	1.77	0.02
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	0.91	0.03
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	7.8900e-004	4.8000e-005
tblVehicleEF	UBUS	4.7670e-003	1.9700e-004
tblVehicleEF	UBUS	0.15	2.6620e-003
tblVehicleEF	UBUS	2.3580e-003	1.2100e-004
tblVehicleEF	UBUS	2.35	1.14
tblVehicleEF	UBUS	0.03	0.02
tblVehicleEF	UBUS	0.99	0.03
tblVehicleTrips	ST_TR	10.18	9.00
tblVehicleTrips	SU_TR	8.91	8.55
tblVehicleTrips	WD_TR	13.22	12.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	12.7845	3.4000e-004	0.0362	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0697	0.0697	1.9000e-004	0.0000	0.0744
Energy	2.1175	19.2496	16.1696	0.1155		1.4630	1.4630		1.4630	1.4630	0.0000	20,955.4872	20,955.4872	0.4017	0.3842	21,080.0152

Mobile	23.5013	48.7823	183.5492	0.4662	23.5995	0.8085	24.4080	6.6961	0.7653	7.4614	0.0000	43,266.6230	43,266.6230	2.3219	0.0000	43,324.6693
Waste						0.0000	0.0000		0.0000	0.0000	324.7855	0.0000	324.7855	19.1943	0.0000	804.6424
Water						0.0000	0.0000		0.0000	0.0000	155.2558	0.0000	155.2558	15.9463	0.3765	666.1171
Total	**38.4032**	**68.0322**	**199.7550**	**0.5817**	**23.5995**	**2.2716**	**25.8711**	**6.6961**	**2.2284**	**8.9245**	**480.0414**	**64,222.1799**	**64,702.2213**	**37.8642**	**0.7607**	**65,875.5184**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	12.7845	3.4000e-004	0.0362	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0697	0.0697	1.9000e-004	0.0000	0.0744
Energy	2.1175	19.2496	16.1696	0.1155		1.4630	1.4630		1.4630	1.4630	0.0000	20,955.4872	20,955.4872	0.4017	0.3842	21,080.0152
Mobile	23.5013	48.7823	183.5492	0.4662	23.5995	0.8085	24.4080	6.6961	0.7653	7.4614	0.0000	43,266.6230	43,266.6230	2.3219	0.0000	43,324.6693
Waste						0.0000	0.0000		0.0000	0.0000	324.7855	0.0000	324.7855	19.1943	0.0000	804.6424
Water						0.0000	0.0000		0.0000	0.0000	155.2558	0.0000	155.2558	15.9463	0.3765	666.1171
Total	**38.4032**	**68.0322**	**199.7550**	**0.5817**	**23.5995**	**2.2716**	**25.8711**	**6.6961**	**2.2284**	**8.9245**	**480.0414**	**64,222.1799**	**64,702.2213**	**37.8642**	**0.7607**	**65,875.5184**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description

1	Site Preparation	Site Preparation	12/4/2019	2/25/2020	5	60	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	23.5013	48.7823	183.5492	0.4662	23.5995	0.8085	24.4080	6.6961	0.7653	7.4614	0.0000	43,266.6230	43,266.6230	2.3219	0.0000	43,324.6693
Unmitigated	23.5013	48.7823	183.5492	0.4662	23.5995	0.8085	24.4080	6.6961	0.7653	7.4614	0.0000	43,266.6230	43,266.6230	2.3219	0.0000	43,324.6693

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Hospital	46,800.00	35,100.00	33345.00	108,812,645	108,812,645
Total	46,800.00	35,100.00	33,345.00	108,812,645	108,812,645

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Hospital	9.50	7.30	7.30	64.90	16.10	19.00	73	25	2

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Hospital	0.558355	0.055004	0.187127	0.116886	0.024672	0.005575	0.017164	0.024194	0.001939	0.001702	0.005819	0.000751	0.000813

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	2.1175	19.2496	16.1696	0.1155		1.4630	1.4630		1.4630	1.4630	0.0000	20,955.4872	20,955.4872	0.4017	0.3842	21,080.0152
NaturalGas Unmitigated	2.1175	19.2496	16.1696	0.1155		1.4630	1.4630		1.4630	1.4630	0.0000	20,955.4872	20,955.4872	0.4017	0.3842	21,080.0152

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					

Hospital	3.92691e+008	2.1175	19.2496	16.1696	0.1155		1.4630	1.4630		1.4630	1.4630	0.0000	20,955.4872	20,955.4872	0.4017	0.3842	21,080.0152
Total		**2.1175**	**19.2496**	**16.1696**	**0.1155**		**1.4630**	**1.4630**		**1.4630**	**1.4630**	**0.0000**	**20,955.4872**	**20,955.4872**	**0.4017**	**0.3842**	**21,080.0152**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Hospital	3.92691e+008	2.1175	19.2496	16.1696	0.1155		1.4630	1.4630		1.4630	1.4630	0.0000	20,955.4872	20,955.4872	0.4017	0.3842	21,080.0152
Total		**2.1175**	**19.2496**	**16.1696**	**0.1155**		**1.4630**	**1.4630**		**1.4630**	**1.4630**	**0.0000**	**20,955.4872**	**20,955.4872**	**0.4017**	**0.3842**	**21,080.0152**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Hospital	6.3258e+007	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Hospital	6.3258e+007	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	12.7845	3.4000e-004	0.0362	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0697	0.0697	1.9000e-004	0.0000	0.0744
Unmitigated	12.7845	3.4000e-004	0.0362	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0697	0.0697	1.9000e-004	0.0000	0.0744

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.0336					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	10.7474					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.4300e-003	3.4000e-004	0.0362	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0697	0.0697	1.9000e-004	0.0000	0.0744
Total	**12.7845**	**3.4000e-004**	**0.0362**	**0.0000**		**1.3000e-004**	**1.3000e-004**		**1.3000e-004**	**1.3000e-004**	**0.0000**	**0.0697**	**0.0697**	**1.9000e-004**	**0.0000**	**0.0744**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.0336					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	10.7474					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.4300e-003	3.4000e-004	0.0362	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0697	0.0697	1.9000e-004	0.0000	0.0744
Total	**12.7845**	**3.4000e-004**	**0.0362**	**0.0000**		**1.3000e-004**	**1.3000e-004**		**1.3000e-004**	**1.3000e-004**	**0.0000**	**0.0697**	**0.0697**	**1.9000e-004**	**0.0000**	**0.0744**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	155.2558	15.9463	0.3765	666.1171
Unmitigated	155.2558	15.9463	0.3765	666.1171

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Hospital	489.374 / 93.2141	155.2558	15.9463	0.3765	666.1171
Total		**155.2558**	**15.9463**	**0.3765**	**666.1171**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e

Land Use	Mgal	MT/yr			
Hospital	489.374 / 93.2141	155.2558	15.9463	0.3765	666.1171
Total		**155.2558**	**15.9463**	**0.3765**	**666.1171**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	324.7855	19.1943	0.0000	804.6424
Unmitigated	324.7855	19.1943	0.0000	804.6424

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

Hospital	1600	324.7855	19.1943	0.0000	804.6424
Total		**324.7855**	**19.1943**	**0.0000**	**804.6424**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Hospital	1600	324.7855	19.1943	0.0000	804.6424
Total		**324.7855**	**19.1943**	**0.0000**	**804.6424**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Calculation of Daily Emissions from CalEEMod Annual Output

Mobile Sources:

Pollutants:	ROG	NOx	PM10	PM2.5	CO	SO2	PM10 ex	PM10 FD	PM2.5 ex	PM2.5 FD
Annual (TPY) frm CalEEMod =	23.5013	48.7823	24.4080	7.4614	183.5492	0.4662	0.8085	23.5995	0.7653	6.6961
Daily PPD =	128.774247	267.300274	133.742466	40.88438356	1005.749	2.554521	4.430137	129.3123	4.193425	36.69096

1 ton = 2000 pounds
1 Year = 365 days

Area Sources:

Pollutants:	ROG	NOx	PM10	PM2.5
Annual (TPY) frm CalEEMod =	12.7845	3.4000e-004	1.3000e-004	1.3000e-004
Daily PPD =	70.0520548	0.001863014	0.00071233	0.000712329

1 ton = 2000 pounds
1 Year = 365 days

Architectural Coatings:	ROG	NOx	PM10	PM2.5
Pollutants:				
Annual (TPY) frm CalEEMod =	2.0336	NA	NA	NA
Daily PPD =	11.14	NA	NA	NA

Consumer Products:	ROG	NOx	PM10	PM2.5
Annual (TPY) frm CalEEMod =	10.7474	NA	NA	NA
Daily PPD =	58.89	NA	NA	NA

Landscaping:

	ROG	NOx	PM10	PM2.5	CO	SO2
Annual (TPY) frm CalEEMod =	3.4300e-003	3.4000e-004	1.3000e-004	1.3000e-004	0.0362	0.0000
Daily PPD =	0.01879452	0.001863014	0.00071233	0.000712329	0.198356	0

Natural Gas (non-CUP):

Existing non-CUP gas demand =	125792	Therms	From Spreadsheet: TCR 2018 Summary, State and Parn Utilities tab (cell B11)		
Conversion>	1	therm	=	100,000	Btu
Existing non-CUP gas demand =	12579200000	Btu			
	12579.2	MMBtu			

U.S. EPA AP-42 Appendix A

Emission Factors (non-residential from CalEEMod Apx D):		ROG	NOx	PM10	PM2.5	CO	SO2
Pounds/MMBtu =		0.01078431	0.09803922	0.00745098	0.00745098	0.082353	0.000588
2019 Natural Gas Emissions pounds per year =		135.66	1233.25	93.73	93.73	1035.93	7.40
2019 Natural Gas Emissions pounds per day =		0.372	3.379	0.257	0.257	2.838	0.020
2050 increase in square footage =	61%						
2050 Natural Gas Emissions (PPD) =		0.598	5.440	0.413	0.413	4.569	0.033
Incremental Increase from 2019 to 2050 =		0.227	2.061	0.157	0.157	1.731	0.012

Area and Energy Emissions from Existing Aldea Residences to be Demolished

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Mid Rise	42.00	Dwelling Unit	1.11	42,000.00	120

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2019
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	605.78	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - UCSF specific CO2 EF prior to 2025 net zero

Land Use -

Construction Phase - Operational Run only for energy and area source emissions

Off-road Equipment - Operational Run only for energy and area source emissions

Grading - Operational Run only for energy and area source emissions

Trips and VMT - Operational Run only for energy and area source emissions

Vehicle Trips - Operational Run only for energy and area source emissions

Woodstoves - No Hearths at Aldea

Consumer Products - SF-Specific ROG factor

Energy Use -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	2.00	1.00
tblConstructionPhase	PhaseEndDate	1/10/2020	1/9/2020
tblConsumerProducts	ROG_EF	2.14E-05	1.5E-05
tblFireplaces	NumberGas	6.30	0.00
tblFireplaces	NumberNoFireplace	1.68	42.00
tblFireplaces	NumberWood	7.14	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	0	605.78
tblVehicleTrips	ST_TR	6.39	0.00
tblVehicleTrips	SU_TR	5.86	0.00
tblVehicleTrips	WD_TR	6.65	0.00
tblWoodstoves	NumberCatalytic	0.84	0.00
tblWoodstoves	NumberNoncatalytic	0.84	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1541	3.6300e-003	0.3134	2.0000e-005		1.7200e-003	1.7200e-003		1.7200e-003	1.7200e-003	0.0000	0.5094	0.5094	5.0000e-004	0.0000	0.5219
Energy	1.9800e-003	0.0169	7.1900e-003	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	68.2918	68.2918	3.8000e-004	3.6000e-004	68.4081
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Waste						0.0000	0.0000		0.0000	0.0000	3.9218	0.0000	3.9218	0.2318	0.0000	9.7161
Water						0.0000	0.0000		0.0000	0.0000	0.8682	5.7278	6.5959	0.0892	2.1100e-003	9.4525
Total	**0.1561**	**0.0205**	**0.3206**	**1.3000e-004**	**0.0000**	**3.0900e-003**	**3.0900e-003**	**0.0000**	**3.0900e-003**	**3.0900e-003**	**4.7900**	**74.5290**	**79.3189**	**0.3218**	**2.4700e-003**	**88.0986**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.1541	3.6300e-003	0.3134	2.0000e-005		1.7200e-003	1.7200e-003		1.7200e-003	1.7200e-003	0.0000	0.5094	0.5094	5.0000e-004	0.0000	0.5219
Energy	1.9800e-003	0.0169	7.1900e-003	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	68.2918	68.2918	3.8000e-004	3.6000e-004	68.4081
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	3.9218	0.0000	3.9218	0.2318	0.0000	9.7161
Water						0.0000	0.0000		0.0000	0.0000	0.8682	5.7278	6.5959	0.0892	2.1100e-003	9.4525
Total	**0.1561**	**0.0205**	**0.3206**	**1.3000e-004**	**0.0000**	**3.0900e-003**	**3.0900e-003**	**0.0000**	**3.0900e-003**	**3.0900e-003**	**4.7900**	**74.5290**	**79.3189**	**0.3218**	**2.4700e-003**	**88.0986**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/9/2020	1/9/2020	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	0	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	0	7.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.607141	0.042057	0.190386	0.086590	0.015934	0.004793	0.026379	0.008601	0.004262	0.005315	0.007178	0.000921	0.000443

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	48.7245	48.7245	0.0000	0.0000	48.7245
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	48.7245	48.7245	0.0000	0.0000	48.7245
NaturalGas Mitigated	1.9800e-003	0.0169	7.1900e-003	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	19.5673	19.5673	3.8000e-004	3.6000e-004	19.6836
NaturalGas Unmitigated	1.9800e-003	0.0169	7.1900e-003	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	19.5673	19.5673	3.8000e-004	3.6000e-004	19.6836

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	366678	1.9800e-003	0.0169	7.1900e-003	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	19.5673	19.5673	3.8000e-004	3.6000e-004	19.6836
Total		**1.9800e-003**	**0.0169**	**7.1900e-003**	**1.1000e-004**		**1.3700e-003**	**1.3700e-003**		**1.3700e-003**	**1.3700e-003**	**0.0000**	**19.5673**	**19.5673**	**3.8000e-004**	**3.6000e-004**	**19.6836**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	366678	1.9800e-003	0.0169	7.1900e-003	1.1000e-004		1.3700e-003	1.3700e-003		1.3700e-003	1.3700e-003	0.0000	19.5673	19.5673	3.8000e-004	3.6000e-004	19.6836
Total		**1.9800e-003**	**0.0169**	**7.1900e-003**	**1.1000e-004**		**1.3700e-003**	**1.3700e-003**		**1.3700e-003**	**1.3700e-003**	**0.0000**	**19.5673**	**19.5673**	**3.8000e-004**	**3.6000e-004**	**19.6836**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	177324	48.7245	0.0000	0.0000	48.7245
Total		**48.7245**	**0.0000**	**0.0000**	**48.7245**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	177324	48.7245	0.0000	0.0000	48.7245
Total		**48.7245**	**0.0000**	**0.0000**	**48.7245**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1541	3.6300e-003	0.3134	2.0000e-005		1.7200e-003	1.7200e-003		1.7200e-003	1.7200e-003	0.0000	0.5094	0.5094	5.0000e-004	0.0000	0.5219
Unmitigated	0.1541	3.6300e-003	0.3134	2.0000e-005		1.7200e-003	1.7200e-003		1.7200e-003	1.7200e-003	0.0000	0.5094	0.5094	5.0000e-004	0.0000	0.5219

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0296					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1150					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	9.5900e-003	3.6300e-003	0.3134	2.0000e-005		1.7200e-003	1.7200e-003		1.7200e-003	1.7200e-003	0.0000	0.5094	0.5094	5.0000e-004	0.0000	0.5219
Total	**0.1541**	**3.6300e-003**	**0.3134**	**2.0000e-005**		**1.7200e-003**	**1.7200e-003**		**1.7200e-003**	**1.7200e-003**	**0.0000**	**0.5094**	**0.5094**	**5.0000e-004**	**0.0000**	**0.5219**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0296					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1150					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	9.5900e-003	3.6300e-003	0.3134	2.0000e-005		1.7200e-003	1.7200e-003		1.7200e-003	1.7200e-003	0.0000	0.5094	0.5094	5.0000e-004	0.0000	0.5219
Total	**0.1541**	**3.6300e-003**	**0.3134**	**2.0000e-005**		**1.7200e-003**	**1.7200e-003**		**1.7200e-003**	**1.7200e-003**	**0.0000**	**0.5094**	**0.5094**	**5.0000e-004**	**0.0000**	**0.5219**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	6.5959	0.0892	2.1100e-003	9.4525
Unmitigated	6.5959	0.0892	2.1100e-003	9.4525

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	2.73647 / 1.72517	6.5959	0.0892	2.1100e-003	9.4525
Total		**6.5959**	**0.0892**	**2.1100e-003**	**9.4525**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			

Apartments Mid Rise	2.73647 / 1.72517	6.5959	0.0892	2.1100e-003	9.4525
Total		**6.5959**	**0.0892**	**2.1100e-003**	**9.4525**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	3.9218	0.2318	0.0000	9.7161
Unmitigated	3.9218	0.2318	0.0000	9.7161

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	19.32	3.9218	0.2318	0.0000	9.7161
Total		**3.9218**	**0.2318**	**0.0000**	**9.7161**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	19.32	3.9218	0.2318	0.0000	9.7161
Total		**3.9218**	**0.2318**	**0.0000**	**9.7161**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Existing Emissions School of Nursing Demolition

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Research & Development	88.00	1000sqft	2.02	88,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2000
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	605.78	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - UCSF Specific emission rate assuming purchased

Land Use -

Construction Phase -

Off-road Equipment - Operational Run Only

Trips and VMT - Operational run only

Vehicle Trips - Operational Energy Run Only for Building to be demolished. Traffic emissions calculated separately as net new for RAB

Consumer Products -

Area Coating -

Landscape Equipment -

Energy Use -

Water And Wastewater -

Solid Waste -

Grading -

Woodstoves -

Table Name	Column Name	Default Value	New Value
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	0	605.78
tblTripsAndVMT	WorkerTripNumber	6.00	0.00
tblVehicleTrips	ST_TR	1.90	0.00
tblVehicleTrips	SU_TR	1.11	0.00
tblVehicleTrips	WD_TR	8.11	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.4589	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.4589**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.4589	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.4589**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.4459	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	1.5700e-003	1.5700e-003	1.0000e-005	0.0000	1.8400e-003
Energy	0.0117	0.1068	0.0897	6.4000e-004		8.1100e-003	8.1100e-003		8.1100e-003	8.1100e-003	0.0000	299.0301	299.0301	2.2300e-003	2.1300e-003	299.7208
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	1.3580	0.0000	1.3580	0.0803	0.0000	3.3644
Water						0.0000	0.0000		0.0000	0.0000	13.7273	64.3333	78.0606	1.4099	0.0333	123.2295
Total	**0.4576**	**0.1068**	**0.0911**	**6.4000e-004**	**0.0000**	**8.1200e-003**	**8.1200e-003**	**0.0000**	**8.1200e-003**	**8.1200e-003**	**15.0853**	**363.3650**	**378.4503**	**1.4924**	**0.0354**	**426.3165**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.4459	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	1.5700e-003	1.5700e-003	1.0000e-005	0.0000	1.8400e-003
Energy	0.0117	0.1068	0.0897	6.4000e-004		8.1100e-003	8.1100e-003		8.1100e-003	8.1100e-003	0.0000	299.0301	299.0301	2.2300e-003	2.1300e-003	299.7208
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	1.3580	0.0000	1.3580	0.0803	0.0000	3.3644
Water						0.0000	0.0000		0.0000	0.0000	13.7273	64.3333	78.0606	1.4099	0.0333	123.2295
Total	**0.4576**	**0.1068**	**0.0911**	**6.4000e-004**	**0.0000**	**8.1200e-003**	**8.1200e-003**	**0.0000**	**8.1200e-003**	**8.1200e-003**	**15.0853**	**363.3650**	**378.4503**	**1.4924**	**0.0354**	**426.3165**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Architectural Coating	Architectural Coating	10/30/2019	11/12/2019	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 132,000; Non-Residential Outdoor: 44,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	0	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4589					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.4589**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Architectural Coating - 2019

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4589					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.4589**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Research & Development	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Research & Development	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Research & Development	0.652644	0.082781	0.134797	0.044790	0.019744	0.004790	0.031976	0.008157	0.002961	0.010838	0.005393	0.000624	0.000504

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	182.8038	182.8038	0.0000	0.0000	182.8038
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	182.8038	182.8038	0.0000	0.0000	182.8038
NaturalGas Mitigated	0.0117	0.1068	0.0897	6.4000e-004		8.1100e-003	8.1100e-003		8.1100e-003	8.1100e-003	0.0000	116.2264	116.2264	2.2300e-003	2.1300e-003	116.9171
NaturalGas Unmitigated	0.0117	0.1068	0.0897	6.4000e-004		8.1100e-003	8.1100e-003		8.1100e-003	8.1100e-003	0.0000	116.2264	116.2264	2.2300e-003	2.1300e-003	116.9171

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Research & Development	2.178e+006	0.0117	0.1068	0.0897	6.4000e-004		8.1100e-003	8.1100e-003		8.1100e-003	8.1100e-003	0.0000	116.2264	116.2264	2.2300e-003	2.1300e-003	116.9171
Total		**0.0117**	**0.1068**	**0.0897**	**6.4000e-004**		**8.1100e-003**	**8.1100e-003**		**8.1100e-003**	**8.1100e-003**	**0.0000**	**116.2264**	**116.2264**	**2.2300e-003**	**2.1300e-003**	**116.9171**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Research & Development	2.178e+006	0.0117	0.1068	0.0897	6.4000e-004		8.1100e-003	8.1100e-003		8.1100e-003	8.1100e-003	0.0000	116.2264	116.2264	2.2300e-003	2.1300e-003	116.9171
Total		**0.0117**	**0.1068**	**0.0897**	**6.4000e-004**		**8.1100e-003**	**8.1100e-003**		**8.1100e-003**	**8.1100e-003**	**0.0000**	**116.2264**	**116.2264**	**2.2300e-003**	**2.1300e-003**	**116.9171**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Research & Development	665280	182.8038	0.0000	0.0000	182.8038
Total		**182.8038**	**0.0000**	**0.0000**	**182.8038**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Research & Development	665280	182.8038	0.0000	0.0000	182.8038
Total		**182.8038**	**0.0000**	**0.0000**	**182.8038**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.4459	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	1.5700e-003	1.5700e-003	1.0000e-005	0.0000	1.8400e-003
Unmitigated	0.4459	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	1.5700e-003	1.5700e-003	1.0000e-005	0.0000	1.8400e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1020					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3437					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-004	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	1.5700e-003	1.5700e-003	1.0000e-005	0.0000	1.8400e-003
Total	**0.4459**	**1.0000e-005**	**1.4300e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.5700e-003**	**1.5700e-003**	**1.0000e-005**	**0.0000**	**1.8400e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1020					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3437					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-004	1.0000e-005	1.4300e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	1.5700e-003	1.5700e-003	1.0000e-005	0.0000	1.8400e-003
Total	**0.4459**	**1.0000e-005**	**1.4300e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.5700e-003**	**1.5700e-003**	**1.0000e-005**	**0.0000**	**1.8400e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	78.0606	1.4099	0.0333	123.2295
Unmitigated	78.0606	1.4099	0.0333	123.2295

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Research & Development	43.2691 / 0	78.0606	1.4099	0.0333	123.2295
Total		**78.0606**	**1.4099**	**0.0333**	**123.2295**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Research & Development	43.2691 / 0	78.0606	1.4099	0.0333	123.2295
Total		**78.0606**	**1.4099**	**0.0333**	**123.2295**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.3580	0.0803	0.0000	3.3644
Unmitigated	1.3580	0.0803	0.0000	3.3644

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Research & Development	6.69	1.3580	0.0803	0.0000	3.3644
Total		**1.3580**	**0.0803**	**0.0000**	**3.3644**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Research & Development	6.69	1.3580	0.0803	0.0000	3.3644
Total		**1.3580**	**0.0803**	**0.0000**	**3.3644**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Existing Emissions Aldea Housing Initial Phase Demolition

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Research & Development	145.00	1000sqft	3.33	145,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2000
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	605.78	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - UCSF Specific emission rate assuming purchased

Land Use -

Construction Phase -

Off-road Equipment - Operational Run Only

Trips and VMT - Operational run only

Vehicle Trips - Operational Energy Run Only for Building to be demolished. Traffic emissions calculated separately as net new for RAB

Consumer Products -

Area Coating -

Landscape Equipment -

Energy Use -

Water And Wastewater -

Solid Waste -

Table Name	Column Name	Default Value	New Value
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	0	605.78
tblTripsAndVMT	WorkerTripNumber	9.00	0.00
tblVehicleTrips	ST_TR	1.90	0.00
tblVehicleTrips	SU_TR	1.11	0.00
tblVehicleTrips	WD_TR	8.11	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.7561	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.7561**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	tons/yr										MT/yr					
2019	0.7561	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.7561**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7347	2.0000e-005	2.3600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.5900e-003	2.5900e-003	2.0000e-005	0.0000	3.0300e-003
Energy	0.0194	0.1759	0.1478	1.0600e-003		0.0134	0.0134		0.0134	0.0134	0.0000	492.7201	492.7201	3.6700e-003	3.5100e-003	493.8582
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	2.2370	0.0000	2.2370	0.1322	0.0000	5.5420
Water						0.0000	0.0000		0.0000	0.0000	22.6188	106.0037	128.6225	2.3232	0.0549	203.0486
Total	**0.7540**	**0.1759**	**0.1501**	**1.0600e-003**	**0.0000**	**0.0134**	**0.0134**	**0.0000**	**0.0134**	**0.0134**	**24.8558**	**598.7264**	**623.5822**	**2.4591**	**0.0584**	**702.4517**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.7347	2.0000e-005	2.3600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.5900e-003	2.5900e-003	2.0000e-005	0.0000	3.0300e-003
Energy	0.0194	0.1759	0.1478	1.0600e-003		0.0134	0.0134		0.0134	0.0134	0.0000	492.7201	492.7201	3.6700e-003	3.5100e-003	493.8582
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	2.2370	0.0000	2.2370	0.1322	0.0000	5.5420
Water						0.0000	0.0000		0.0000	0.0000	22.6188	106.0037	128.6225	2.3232	0.0549	203.0486
Total	**0.7540**	**0.1759**	**0.1501**	**1.0600e-003**	**0.0000**	**0.0134**	**0.0134**	**0.0000**	**0.0134**	**0.0134**	**24.8558**	**598.7264**	**623.5822**	**2.4591**	**0.0584**	**702.4517**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Architectural Coating	Architectural Coating	10/30/2019	11/22/2019	5	18	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 217,500; Non-Residential Outdoor: 72,500; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	0	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.7561					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.7561**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.7561					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.7561**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Research & Development	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Research & Development	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Research & Development	0.652644	0.082781	0.134797	0.044790	0.019744	0.004790	0.031976	0.008157	0.002961	0.010838	0.005393	0.000624	0.000504

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	301.2108	301.2108	0.0000	0.0000	301.2108
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	301.2108	301.2108	0.0000	0.0000	301.2108
NaturalGas Mitigated	0.0194	0.1759	0.1478	1.0600e-003		0.0134	0.0134		0.0134	0.0134	0.0000	191.5094	191.5094	3.6700e-003	3.5100e-003	192.6474
NaturalGas Unmitigated	0.0194	0.1759	0.1478	1.0600e-003		0.0134	0.0134		0.0134	0.0134	0.0000	191.5094	191.5094	3.6700e-003	3.5100e-003	192.6474

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Research & Development	3.58875e+006	0.0194	0.1759	0.1478	1.0600e-003		0.0134	0.0134		0.0134	0.0134	0.0000	191.5094	191.5094	3.6700e-003	3.5100e-003	192.6474
Total		**0.0194**	**0.1759**	**0.1478**	**1.0600e-003**		**0.0134**	**0.0134**		**0.0134**	**0.0134**	**0.0000**	**191.5094**	**191.5094**	**3.6700e-003**	**3.5100e-003**	**192.6474**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Research & Development	3.58875e+006	0.0194	0.1759	0.1478	1.0600e-003		0.0134	0.0134		0.0134	0.0134	0.0000	191.5094	191.5094	3.6700e-003	3.5100e-003	192.6474
Total		**0.0194**	**0.1759**	**0.1478**	**1.0600e-003**		**0.0134**	**0.0134**		**0.0134**	**0.0134**	**0.0000**	**191.5094**	**191.5094**	**3.6700e-003**	**3.5100e-003**	**192.6474**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Research & Development	1.0962e+006	301.2108	0.0000	0.0000	301.2108
Total		**301.2108**	**0.0000**	**0.0000**	**301.2108**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Research & Development	1.0962e+006	301.2108	0.0000	0.0000	301.2108

Total		**301.2108**	**0.0000**	**0.0000**	**301.2108**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.7347	2.0000e-005	2.3600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.5900e-003	2.5900e-003	2.0000e-005	0.0000	3.0300e-003
Unmitigated	0.7347	2.0000e-005	2.3600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.5900e-003	2.5900e-003	2.0000e-005	0.0000	3.0300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1680					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5663					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.3000e-004	2.0000e-005	2.3600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.5900e-003	2.5900e-003	2.0000e-005	0.0000	3.0300e-003

Total	**0.7347**	**2.0000e-005**	**2.3600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**2.5900e-003**	**2.5900e-003**	**2.0000e-005**	**0.0000**	**3.0300e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1680					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.5663					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.3000e-004	2.0000e-005	2.3600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	2.5900e-003	2.5900e-003	2.0000e-005	0.0000	3.0300e-003
Total	**0.7347**	**2.0000e-005**	**2.3600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**2.5900e-003**	**2.5900e-003**	**2.0000e-005**	**0.0000**	**3.0300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	128.6225	2.3232	0.0549	203.0486
Unmitigated	128.6225	2.3232	0.0549	203.0486

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Research & Development	71.2956 / 0	128.6225	2.3232	0.0549	203.0486
Total		**128.6225**	**2.3232**	**0.0549**	**203.0486**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Research & Development	71.2956 / 0	128.6225	2.3232	0.0549	203.0486
Total		**128.6225**	**2.3232**	**0.0549**	**203.0486**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	2.2370	0.1322	0.0000	5.5420
Unmitigated	2.2370	0.1322	0.0000	5.5420

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Research & Development	11.02	2.2370	0.1322	0.0000	5.5420
Total		**2.2370**	**0.1322**	**0.0000**	**5.5420**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Research & Development	11.02	2.2370	0.1322	0.0000	5.5420

Total		2.2370	0.1322	0.0000	5.5420

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CalEEmod Outputs Project Operation

CPHP Operational CPHP Campus Wide 2050

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Hospital	6,000.00	1000sqft	137.74	6,000,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2050
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - UCSF Net zero GHG electricity starting in 2025

Land Use - Full campus SF to calculate area sources

Construction Phase - mobile source run only

Off-road Equipment - Operational Mobile Source Run only

Trips and VMT - Mobile and area source run only

Vehicle Trips - Adjust trip rates to match daily VMT of the transportation analysis.

Road Dust - CARB Method 7.9

Consumer Products - SF Specific ROG Factor

Energy Use - Net xero electricity. Natural gas separate through CUP

Solid Waste - Adjust waste rates to reflect Utilities analysis data existing and with CPHP

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	120.00	1.00
tblConsumerProducts	ROG_EF	2.14E-05	1.5E-05
tblEnergyUse	LightingElect	4.23	0.00
tblEnergyUse	NT24E	5.52	0.00
tblEnergyUse	NT24NG	15.80	0.00
tblEnergyUse	T24E	6.47	0.00
tblEnergyUse	T24NG	84.89	0.00
tblFleetMix	HHD	0.01	0.03
tblFleetMix	LDA	0.59	0.57
tblFleetMix	LDT1	0.04	0.06
tblFleetMix	LDT2	0.19	0.17
tblFleetMix	LHD1	0.01	0.02
tblFleetMix	LHD2	5.4090e-003	6.1250e-003
tblFleetMix	MCY	5.4800e-003	5.3500e-003
tblFleetMix	MDV	0.09	0.11
tblFleetMix	MH	6.8300e-004	7.6200e-004
tblFleetMix	MHD	0.04	0.02
tblFleetMix	OBUS	4.9020e-003	1.6650e-003
tblFleetMix	SBUS	9.2300e-004	1.0690e-003
tblFleetMix	UBUS	1.6050e-003	1.3540e-003
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblRoadDust	RoadSiltLoading	0.1	0.048
tblSolidWaste	SolidWasteGenerationRate	64,800.00	2,228.00
tblVehicleEF	HHD	0.28	0.02
tblVehicleEF	HHD	0.42	0.04

tblVehicleEF	HHD	0.05	0.00
tblVehicleEF	HHD	0.97	6.50
tblVehicleEF	HHD	2.63	0.40
tblVehicleEF	HHD	7.01	6.2370e-003
tblVehicleEF	HHD	2,799.48	828.78
tblVehicleEF	HHD	1,647.12	1,033.18
tblVehicleEF	HHD	20.36	0.05
tblVehicleEF	HHD	8.04	5.21
tblVehicleEF	HHD	1.34	2.43
tblVehicleEF	HHD	18.05	2.33
tblVehicleEF	HHD	9.7100e-004	1.8790e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.03	0.04
tblVehicleEF	HHD	4.8370e-003	0.02
tblVehicleEF	HHD	2.5500e-004	1.0000e-006
tblVehicleEF	HHD	9.2900e-004	1.7980e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.5490e-003	8.9000e-003
tblVehicleEF	HHD	4.6270e-003	0.02
tblVehicleEF	HHD	2.3400e-004	1.0000e-006
tblVehicleEF	HHD	1.6300e-004	2.0000e-006
tblVehicleEF	HHD	8.4180e-003	7.8000e-005
tblVehicleEF	HHD	0.22	0.43
tblVehicleEF	HHD	1.2700e-004	1.0000e-006
tblVehicleEF	HHD	0.08	0.02
tblVehicleEF	HHD	1.3420e-003	4.0400e-004
tblVehicleEF	HHD	0.12	0.00
tblVehicleEF	HHD	0.02	7.7220e-003
tblVehicleEF	HHD	0.01	9.4730e-003
tblVehicleEF	HHD	3.1700e-004	1.0000e-006

tblVehicleEF	HHD	1.6300e-004	2.0000e-006
tblVehicleEF	HHD	8.4180e-003	7.8000e-005
tblVehicleEF	HHD	0.28	0.50
tblVehicleEF	HHD	1.2700e-004	1.0000e-006
tblVehicleEF	HHD	0.51	0.06
tblVehicleEF	HHD	1.3420e-003	4.0400e-004
tblVehicleEF	HHD	0.13	0.00
tblVehicleEF	LDA	1.4270e-003	5.4400e-004
tblVehicleEF	LDA	4.8300e-004	0.02
tblVehicleEF	LDA	0.25	0.34
tblVehicleEF	LDA	0.31	1.35
tblVehicleEF	LDA	175.93	177.82
tblVehicleEF	LDA	34.59	35.86
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	9.7730e-003	0.11
tblVehicleEF	LDA	7.0000e-004	4.6800e-004
tblVehicleEF	LDA	7.8800e-004	6.0800e-004
tblVehicleEF	LDA	6.4400e-004	4.3100e-004
tblVehicleEF	LDA	7.2400e-004	5.5900e-004
tblVehicleEF	LDA	5.9710e-003	0.01
tblVehicleEF	LDA	0.03	0.03
tblVehicleEF	LDA	6.4660e-003	0.01
tblVehicleEF	LDA	3.6030e-003	1.5350e-003
tblVehicleEF	LDA	0.03	0.14
tblVehicleEF	LDA	6.5160e-003	0.06
tblVehicleEF	LDA	3.5000e-004	3.5500e-004
tblVehicleEF	LDA	5.9710e-003	0.01
tblVehicleEF	LDA	0.03	0.03
tblVehicleEF	LDA	6.4660e-003	0.01
tblVehicleEF	LDA	5.2320e-003	2.2240e-003

tblVehicleEF	LDA	0.03	0.14
tblVehicleEF	LDA	7.1350e-003	0.07
tblVehicleEF	LDT1	1.8690e-003	5.8000e-004
tblVehicleEF	LDT1	6.5000e-004	0.02
tblVehicleEF	LDT1	0.31	0.35
tblVehicleEF	LDT1	0.39	1.42
tblVehicleEF	LDT1	220.87	209.99
tblVehicleEF	LDT1	44.08	42.89
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	0.01	0.13
tblVehicleEF	LDT1	8.4300e-004	4.9300e-004
tblVehicleEF	LDT1	9.6700e-004	6.5500e-004
tblVehicleEF	LDT1	7.7500e-004	4.5400e-004
tblVehicleEF	LDT1	8.8900e-004	6.0200e-004
tblVehicleEF	LDT1	0.01	0.02
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.01	0.02
tblVehicleEF	LDT1	4.6360e-003	1.6150e-003
tblVehicleEF	LDT1	0.04	0.17
tblVehicleEF	LDT1	8.7710e-003	0.06
tblVehicleEF	LDT1	2.2100e-003	2.0780e-003
tblVehicleEF	LDT1	4.4600e-004	4.2400e-004
tblVehicleEF	LDT1	0.01	0.02
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.01	0.02
tblVehicleEF	LDT1	6.7610e-003	2.3560e-003
tblVehicleEF	LDT1	0.04	0.17
tblVehicleEF	LDT1	9.6030e-003	0.07
tblVehicleEF	LDT2	2.1570e-003	7.6000e-004
tblVehicleEF	LDT2	9.4900e-004	0.02

tblVehicleEF	LDT2	0.38	0.40
tblVehicleEF	LDT2	0.47	1.82
tblVehicleEF	LDT2	257.62	210.22
tblVehicleEF	LDT2	51.21	42.99
tblVehicleEF	LDT2	0.03	0.02
tblVehicleEF	LDT2	0.02	0.12
tblVehicleEF	LDT2	8.4100e-004	5.2900e-004
tblVehicleEF	LDT2	9.4700e-004	6.3500e-004
tblVehicleEF	LDT2	7.7400e-004	4.8800e-004
tblVehicleEF	LDT2	8.7100e-004	5.8400e-004
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	5.3850e-003	2.3170e-003
tblVehicleEF	LDT2	0.04	0.17
tblVehicleEF	LDT2	0.01	0.09
tblVehicleEF	LDT2	2.5780e-003	2.0790e-003
tblVehicleEF	LDT2	5.1900e-004	4.2500e-004
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	7.8410e-003	3.3370e-003
tblVehicleEF	LDT2	0.04	0.17
tblVehicleEF	LDT2	0.01	0.09
tblVehicleEF	LHD1	2.4170e-003	3.1500e-003
tblVehicleEF	LHD1	4.6940e-003	3.8390e-003
tblVehicleEF	LHD1	2.6090e-003	4.6680e-003
tblVehicleEF	LHD1	0.12	0.17
tblVehicleEF	LHD1	0.45	0.37
tblVehicleEF	LHD1	0.95	0.74

tblVehicleEF	LHD1	8.76	7.32
tblVehicleEF	LHD1	603.63	618.17
tblVehicleEF	LHD1	20.98	8.26
tblVehicleEF	LHD1	0.04	0.03
tblVehicleEF	LHD1	0.07	0.11
tblVehicleEF	LHD1	0.25	0.17
tblVehicleEF	LHD1	5.8800e-004	1.0160e-003
tblVehicleEF	LHD1	0.01	0.01
tblVehicleEF	LHD1	5.5980e-003	4.6190e-003
tblVehicleEF	LHD1	4.2800e-004	1.7500e-004
tblVehicleEF	LHD1	5.6200e-004	9.7200e-004
tblVehicleEF	LHD1	2.6620e-003	2.5020e-003
tblVehicleEF	LHD1	5.3290e-003	4.3780e-003
tblVehicleEF	LHD1	3.9400e-004	1.6100e-004
tblVehicleEF	LHD1	6.1100e-004	8.1200e-004
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	0.01	0.01
tblVehicleEF	LHD1	4.8100e-004	5.7000e-004
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	0.06	0.15
tblVehicleEF	LHD1	0.04	0.02
tblVehicleEF	LHD1	8.6000e-005	7.1000e-005
tblVehicleEF	LHD1	5.8780e-003	6.0210e-003
tblVehicleEF	LHD1	2.2500e-004	8.2000e-005
tblVehicleEF	LHD1	6.1100e-004	8.1200e-004
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	4.8100e-004	5.7000e-004
tblVehicleEF	LHD1	0.10	0.08
tblVehicleEF	LHD1	0.06	0.15

tblVehicleEF	LHD1	0.04	0.02
tblVehicleEF	LHD2	2.0490e-003	1.9500e-003
tblVehicleEF	LHD2	4.7590e-003	4.7410e-003
tblVehicleEF	LHD2	1.8250e-003	2.6000e-003
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.44	0.47
tblVehicleEF	LHD2	0.82	0.42
tblVehicleEF	LHD2	13.26	11.61
tblVehicleEF	LHD2	661.14	607.64
tblVehicleEF	LHD2	20.88	5.33
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.06	0.12
tblVehicleEF	LHD2	0.17	0.10
tblVehicleEF	LHD2	8.2400e-004	1.5230e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	6.9970e-003	0.01
tblVehicleEF	LHD2	3.8600e-004	1.0100e-004
tblVehicleEF	LHD2	7.8800e-004	1.4570e-003
tblVehicleEF	LHD2	2.7120e-003	2.7230e-003
tblVehicleEF	LHD2	6.6700e-003	0.01
tblVehicleEF	LHD2	3.5500e-004	9.2000e-005
tblVehicleEF	LHD2	3.8200e-004	4.5600e-004
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	2.9300e-004	3.2000e-004
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.03	0.08
tblVehicleEF	LHD2	0.02	0.01
tblVehicleEF	LHD2	1.2900e-004	1.1100e-004
tblVehicleEF	LHD2	6.4220e-003	5.8570e-003

tblVehicleEF	LHD2	2.2200e-004	5.3000e-005
tblVehicleEF	LHD2	3.8200e-004	4.5600e-004
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	2.9300e-004	3.2000e-004
tblVehicleEF	LHD2	0.10	0.11
tblVehicleEF	LHD2	0.03	0.08
tblVehicleEF	LHD2	0.03	0.01
tblVehicleEF	MCY	0.58	0.32
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	18.41	17.47
tblVehicleEF	MCY	10.55	9.47
tblVehicleEF	MCY	196.41	213.30
tblVehicleEF	MCY	40.90	57.57
tblVehicleEF	MCY	1.18	1.15
tblVehicleEF	MCY	0.32	0.27
tblVehicleEF	MCY	2.8720e-003	2.3340e-003
tblVehicleEF	MCY	3.2940e-003	3.0160e-003
tblVehicleEF	MCY	2.6770e-003	2.1750e-003
tblVehicleEF	MCY	3.0700e-003	2.8110e-003
tblVehicleEF	MCY	0.74	0.82
tblVehicleEF	MCY	0.60	0.61
tblVehicleEF	MCY	0.45	0.46
tblVehicleEF	MCY	2.66	2.17
tblVehicleEF	MCY	0.47	1.26
tblVehicleEF	MCY	2.08	1.84
tblVehicleEF	MCY	2.3470e-003	2.1110e-003
tblVehicleEF	MCY	6.4200e-004	5.7000e-004
tblVehicleEF	MCY	0.74	0.82
tblVehicleEF	MCY	0.60	0.61

tblVehicleEF	MCY	0.45	0.46
tblVehicleEF	MCY	3.34	2.72
tblVehicleEF	MCY	0.47	1.26
tblVehicleEF	MCY	2.26	2.01
tblVehicleEF	MDV	2.3630e-003	7.4800e-004
tblVehicleEF	MDV	1.1280e-003	0.02
tblVehicleEF	MDV	0.42	0.39
tblVehicleEF	MDV	0.53	1.77
tblVehicleEF	MDV	333.42	253.73
tblVehicleEF	MDV	65.10	50.42
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.02	0.12
tblVehicleEF	MDV	8.7100e-004	5.0000e-004
tblVehicleEF	MDV	9.8600e-004	6.1900e-004
tblVehicleEF	MDV	8.0200e-004	4.6100e-004
tblVehicleEF	MDV	9.0700e-004	5.6900e-004
tblVehicleEF	MDV	0.03	0.04
tblVehicleEF	MDV	0.07	0.06
tblVehicleEF	MDV	0.03	0.04
tblVehicleEF	MDV	6.0450e-003	2.3020e-003
tblVehicleEF	MDV	0.05	0.17
tblVehicleEF	MDV	0.02	0.08
tblVehicleEF	MDV	3.3310e-003	2.5070e-003
tblVehicleEF	MDV	6.5900e-004	4.9900e-004
tblVehicleEF	MDV	0.03	0.04
tblVehicleEF	MDV	0.07	0.06
tblVehicleEF	MDV	0.03	0.04
tblVehicleEF	MDV	8.7490e-003	3.3090e-003
tblVehicleEF	MDV	0.05	0.17
tblVehicleEF	MDV	0.02	0.09

tblVehicleEF	MH	4.0570e-003	2.8260e-003
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	0.17	0.17
tblVehicleEF	MH	3.07	1.16
tblVehicleEF	MH	1,164.20	1,211.74
tblVehicleEF	MH	55.49	12.75
tblVehicleEF	MH	0.61	0.89
tblVehicleEF	MH	0.52	0.18
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	4.5150e-003	6.0970e-003
tblVehicleEF	MH	9.0600e-004	2.1500e-004
tblVehicleEF	MH	3.2190e-003	3.3060e-003
tblVehicleEF	MH	4.2780e-003	5.7970e-003
tblVehicleEF	MH	8.3300e-004	1.9800e-004
tblVehicleEF	MH	0.23	0.20
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	0.13	0.11
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	3.0800e-003	0.17
tblVehicleEF	MH	0.18	0.06
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.0800e-004	1.2600e-004
tblVehicleEF	MH	0.23	0.20
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	0.13	0.11
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	3.0800e-003	0.17
tblVehicleEF	MH	0.20	0.07
tblVehicleEF	MHD	0.02	3.4300e-003
tblVehicleEF	MHD	2.0360e-003	6.2800e-004

tblVehicleEF	MHD	0.03	6.7270e-003
tblVehicleEF	MHD	0.23	0.41
tblVehicleEF	MHD	0.22	0.12
tblVehicleEF	MHD	1.61	0.53
tblVehicleEF	MHD	184.96	59.04
tblVehicleEF	MHD	1,146.81	853.31
tblVehicleEF	MHD	32.83	6.43
tblVehicleEF	MHD	0.49	0.32
tblVehicleEF	MHD	0.99	1.39
tblVehicleEF	MHD	14.70	1.83
tblVehicleEF	MHD	3.8000e-005	8.0000e-005
tblVehicleEF	MHD	2.8650e-003	6.7220e-003
tblVehicleEF	MHD	4.7900e-004	1.0000e-004
tblVehicleEF	MHD	3.6000e-005	7.6000e-005
tblVehicleEF	MHD	2.7390e-003	6.4250e-003
tblVehicleEF	MHD	4.4000e-004	9.2000e-005
tblVehicleEF	MHD	3.1400e-004	2.3500e-004
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	2.4400e-004	1.6400e-004
tblVehicleEF	MHD	0.04	9.5590e-003
tblVehicleEF	MHD	6.6150e-003	0.06
tblVehicleEF	MHD	0.11	0.03
tblVehicleEF	MHD	1.7710e-003	5.6000e-004
tblVehicleEF	MHD	0.01	8.1290e-003
tblVehicleEF	MHD	3.5700e-004	6.4000e-005
tblVehicleEF	MHD	3.1400e-004	2.3500e-004
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	2.4400e-004	1.6400e-004

tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	6.6150e-003	0.06
tblVehicleEF	MHD	0.12	0.04
tblVehicleEF	OBUS	0.01	7.1740e-003
tblVehicleEF	OBUS	2.9690e-003	9.9400e-004
tblVehicleEF	OBUS	0.02	0.01
tblVehicleEF	OBUS	0.24	0.69
tblVehicleEF	OBUS	0.28	0.15
tblVehicleEF	OBUS	3.15	0.96
tblVehicleEF	OBUS	191.67	92.21
tblVehicleEF	OBUS	1,273.32	1,079.52
tblVehicleEF	OBUS	56.79	10.79
tblVehicleEF	OBUS	0.47	0.47
tblVehicleEF	OBUS	1.03	1.55
tblVehicleEF	OBUS	4.74	1.23
tblVehicleEF	OBUS	4.3000e-005	1.5700e-004
tblVehicleEF	OBUS	3.2390e-003	8.2570e-003
tblVehicleEF	OBUS	8.9800e-004	1.6500e-004
tblVehicleEF	OBUS	4.1000e-005	1.5000e-004
tblVehicleEF	OBUS	3.0870e-003	7.8860e-003
tblVehicleEF	OBUS	8.2600e-004	1.5200e-004
tblVehicleEF	OBUS	1.0340e-003	9.3800e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	0.04	0.05
tblVehicleEF	OBUS	5.9200e-004	4.8900e-004
tblVehicleEF	OBUS	0.05	0.01
tblVehicleEF	OBUS	0.03	0.16
tblVehicleEF	OBUS	0.21	0.06
tblVehicleEF	OBUS	1.8390e-003	8.7500e-004
tblVehicleEF	OBUS	0.01	0.01

tblVehicleEF	OBUS	6.2300e-004	1.0700e-004
tblVehicleEF	OBUS	1.0340e-003	9.3800e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	0.05	0.07
tblVehicleEF	OBUS	5.9200e-004	4.8900e-004
tblVehicleEF	OBUS	0.05	0.01
tblVehicleEF	OBUS	0.03	0.16
tblVehicleEF	OBUS	0.23	0.06
tblVehicleEF	SBUS	0.83	0.08
tblVehicleEF	SBUS	3.4400e-003	1.0470e-003
tblVehicleEF	SBUS	0.05	6.3860e-003
tblVehicleEF	SBUS	7.98	3.37
tblVehicleEF	SBUS	0.27	0.13
tblVehicleEF	SBUS	5.78	0.74
tblVehicleEF	SBUS	1,016.91	266.29
tblVehicleEF	SBUS	1,017.35	760.31
tblVehicleEF	SBUS	54.67	4.58
tblVehicleEF	SBUS	2.15	1.21
tblVehicleEF	SBUS	0.91	1.00
tblVehicleEF	SBUS	11.65	1.94
tblVehicleEF	SBUS	1.5800e-004	2.9400e-004
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	2.6290e-003	5.6440e-003
tblVehicleEF	SBUS	1.2280e-003	9.0000e-005
tblVehicleEF	SBUS	1.5200e-004	2.8100e-004
tblVehicleEF	SBUS	2.6410e-003	2.6620e-003
tblVehicleEF	SBUS	2.4930e-003	5.3800e-003
tblVehicleEF	SBUS	1.1290e-003	8.3000e-005
tblVehicleEF	SBUS	3.3160e-003	1.1020e-003
tblVehicleEF	SBUS	0.03	0.01

tblVehicleEF	SBUS	0.97	0.35
tblVehicleEF	SBUS	1.9100e-003	5.7700e-004
tblVehicleEF	SBUS	0.04	9.3010e-003
tblVehicleEF	SBUS	0.02	0.07
tblVehicleEF	SBUS	0.33	0.04
tblVehicleEF	SBUS	9.9840e-003	2.5440e-003
tblVehicleEF	SBUS	9.8070e-003	7.2870e-003
tblVehicleEF	SBUS	6.4700e-004	4.5000e-005
tblVehicleEF	SBUS	3.3160e-003	1.1020e-003
tblVehicleEF	SBUS	0.03	0.01
tblVehicleEF	SBUS	1.41	0.50
tblVehicleEF	SBUS	1.9100e-003	5.7700e-004
tblVehicleEF	SBUS	0.05	0.01
tblVehicleEF	SBUS	0.02	0.07
tblVehicleEF	SBUS	0.36	0.04
tblVehicleEF	UBUS	0.23	1.76
tblVehicleEF	UBUS	0.06	5.6880e-003
tblVehicleEF	UBUS	2.03	13.30
tblVehicleEF	UBUS	8.07	0.42
tblVehicleEF	UBUS	1,833.90	1,626.43
tblVehicleEF	UBUS	143.86	3.85
tblVehicleEF	UBUS	0.96	0.68
tblVehicleEF	UBUS	11.91	0.04
tblVehicleEF	UBUS	0.49	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	5.1640e-003	4.9490e-003
tblVehicleEF	UBUS	1.7000e-003	5.0000e-005
tblVehicleEF	UBUS	0.21	0.03
tblVehicleEF	UBUS	3.0000e-003	7.8890e-003
tblVehicleEF	UBUS	4.8970e-003	4.7310e-003

tblVehicleEF	UBUS	1.5630e-003	4.6000e-005
tblVehicleEF	UBUS	3.0320e-003	2.1200e-004
tblVehicleEF	UBUS	0.05	2.9750e-003
tblVehicleEF	UBUS	2.2660e-003	1.3000e-004
tblVehicleEF	UBUS	0.02	0.03
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	0.78	0.03
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	1.5880e-003	3.8000e-005
tblVehicleEF	UBUS	3.0320e-003	2.1200e-004
tblVehicleEF	UBUS	0.05	2.9750e-003
tblVehicleEF	UBUS	2.2660e-003	1.3000e-004
tblVehicleEF	UBUS	0.26	1.79
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	0.85	0.03
tblVehicleTrips	ST_TR	10.18	12.00
tblVehicleTrips	SU_TR	8.91	10.91
tblVehicleTrips	WD_TR	13.22	15.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	**Start Date**	**End Date**	**Maximum Unmitigated ROG + NOX (tons/quarter)**	**Maximum Mitigated ROG + NOX (tons/quarter)**
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	19.5586	4.9000e-004	0.0548	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	0.1072	0.1072	2.8000e-004	0.0000	0.1141

Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	14.3044	43.9280	163.3997	0.5895	46.0200	0.3702	46.3902	13.0759	0.3495	13.4254	0.0000	54,991.3314	54,991.3314	1.8725	0.0000	55,038.1432
Waste						0.0000	0.0000		0.0000	0.0000	452.2639	0.0000	452.2639	26.7280	0.0000	1,120.4646
Water						0.0000	0.0000		0.0000	0.0000	238.8551	0.0000	238.8551	24.5327	0.5793	1,024.7955
Total	**33.8631**	**43.9285**	**163.4545**	**0.5895**	**46.0200**	**0.3704**	**46.3904**	**13.0759**	**0.3497**	**13.4255**	**691.1190**	**54,991.4386**	**55,682.5576**	**53.1335**	**0.5793**	**57,183.5174**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	19.5586	4.9000e-004	0.0548	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	0.1072	0.1072	2.8000e-004	0.0000	0.1141
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	14.3044	43.9280	163.3997	0.5895	46.0200	0.3702	46.3902	13.0759	0.3495	13.4254	0.0000	54,991.3314	54,991.3314	1.8725	0.0000	55,038.1432
Waste						0.0000	0.0000		0.0000	0.0000	452.2639	0.0000	452.2639	26.7280	0.0000	1,120.4646
Water						0.0000	0.0000		0.0000	0.0000	238.8551	0.0000	238.8551	24.5327	0.5793	1,024.7955
Total	**33.8631**	**43.9285**	**163.4545**	**0.5895**	**46.0200**	**0.3704**	**46.3904**	**13.0759**	**0.3497**	**13.4255**	**691.1190**	**54,991.4386**	**55,682.5576**	**53.1335**	**0.5793**	**57,183.5174**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	12/4/2019	12/4/2019	5	1	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	14.3044	43.9280	163.3997	0.5895	46.0200	0.3702	46.3902	13.0759	0.3495	13.4254	0.0000	54,991.3314	54,991.3314	1.8725	0.0000	55,038.1432
Unmitigated	14.3044	43.9280	163.3997	0.5895	46.0200	0.3702	46.3902	13.0759	0.3495	13.4254	0.0000	54,991.3314	54,991.3314	1.8725	0.0000	55,038.1432

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Hospital	90,000.00	72,000.00	65460.00	211,354,384	211,354,384
Total	90,000.00	72,000.00	65,460.00	211,354,384	211,354,384

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Hospital	9.50	7.30	7.30	64.90	16.10	19.00	73	25	2

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Hospital	0.566162	0.056935	0.174451	0.112896	0.022384	0.006125	0.020280	0.030566	0.001665	0.001354	0.005350	0.001069	0.000762

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Hospital	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Hospital	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e

Land Use	kWh/yr	MT/yr			
Hospital	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Hospital	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Mitigated	19.5586	4.9000e-004	0.0548	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	0.1072	0.1072	2.8000e-004	0.0000	0.1141
Unmitigated	19.5586	4.9000e-004	0.0548	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	0.1072	0.1072	2.8000e-004	0.0000	0.1141

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.1286					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	16.4250					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0100e-003	4.9000e-004	0.0548	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	0.1072	0.1072	2.8000e-004	0.0000	0.1141
Total	**19.5586**	**4.9000e-004**	**0.0548**	**0.0000**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**	**0.0000**	**0.1072**	**0.1072**	**2.8000e-004**	**0.0000**	**0.1141**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.1286					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	16.4250					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	5.0100e-003	4.9000e-004	0.0548	0.0000		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004	0.0000	0.1072	0.1072	2.8000e-004	0.0000	0.1141

Total	**19.5586**	**4.9000e-004**	**0.0548**	**0.0000**		**1.9000e-004**	**1.9000e-004**		**1.9000e-004**	**1.9000e-004**	**0.0000**	**0.1072**	**0.1072**	**2.8000e-004**	**0.0000**	**0.1141**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	238.8551	24.5327	0.5793	1,024.7955
Unmitigated	238.8551	24.5327	0.5793	1,024.7955

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Hospital	752.883 / 143.406	238.8551	24.5327	0.5793	1,024.7955
Total		**238.8551**	**24.5327**	**0.5793**	**1,024.7955**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Hospital	752.883 / 143.406	238.8551	24.5327	0.5793	1,024.7955
Total		**238.8551**	**24.5327**	**0.5793**	**1,024.7955**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	452.2639	26.7280	0.0000	1,120.4646
Unmitigated	452.2639	26.7280	0.0000	1,120.4646

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Hospital	2228	452.2639	26.7280	0.0000	1,120.4646
Total		**452.2639**	**26.7280**	**0.0000**	**1,120.4646**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Hospital	2228	452.2639	26.7280	0.0000	1,120.4646
Total		**452.2639**	**26.7280**	**0.0000**	**1,120.4646**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Calculation of Daily Emissions from CalEEMod Annual Output

Mobile Sources:

Pollutants:	ROG	NOx	PM10	PM2.5	CO	SO2	PM10 FD	PM10 EX	PM2.5 FD	PM2.5 EX
Annual (TPY) frm CalEEMod =	14.3044	43.9280	46.3902	13.4254	163.3997	0.5895	46.0200	0.3702	13.0759	13.4254
Daily PPD =	78.380	240.701	254.193	73.564	895.341	3.230	252.164	2.028	71.649	73.564

1 ton = 2000 pounds
1 Year = 365 days

Area Sources:

Pollutants:	ROG	NOx	PM10	PM2.5
Annual (TPY) frm CalEEMod =	19.5586	4.9000e-004	1.9000e-004	1.9000e-004
Daily PPD =	107.1704	0.0027	0.0010	0.0010

Architectural Coatings:	ROG	NOx	PM10	PM2.5	CO	SO2	ROG Difference from 2019
Pollutants:							
Annual (TPY) frm CalEEMod =	3.1286	NA					
Daily PPD =	17.1430137						15.11

Consumer Products:	ROG	NOx	PM10	PM2.5	CO	SO2	
Annual (TPY) frm CalEEMod =	16.4250						
Daily PPD =	90.00						5.68

Landscaping:	ROG	NOx	PM10	PM2.5	CO	SO2
Annual (TPY) frm CalEEMod =	5.0100e-003	4.9000e-004	1.9000e-004	1.9000e-004	0.0548	0.0000
Daily PPD =	2.75E-02	2.68E-03	1.04E-03	1.04E-03	0.300274	0

UCSF Initial Phase Projects Operational - San Francisco County, Annual

UCSF Initial Phase Projects Operational

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Research & Development	270.00	1000sqft	2.50	270,000.00	0
Apartments High Rise	142.00	Dwelling Unit	2.29	142,000.00	406

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2030
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Operational Run Only

UCSF Net zero electricity by 2025

Land Use - Project specific acreage

Construction Phase - operational run only

Off-road Equipment - operational run only. Construction in separate run.

Trips and VMT - operational run only.

Vehicle Trips - Rate changes to match Adavant VMT

Vehicle Emission Factors - EMFAC 2017

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust - CARB Method 7.9

Woodstoves - No hearths

Energy Use - UCSF Net zweo electricity by 2030

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	741.44	0.00
tblEnergyUse	LightingElect	2.99	0.00
tblEnergyUse	NT24E	3,054.10	0.00
tblEnergyUse	NT24E	3.36	0.00
tblEnergyUse	T24E	426.45	0.00
tblEnergyUse	T24E	1.21	0.00
tblFireplaces	NumberGas	21.30	0.00
tblFireplaces	NumberNoFireplace	5.68	142.00
tblFireplaces	NumberWood	24.14	0.00
tblFleetMix	HHD	9.6790e-003	0.03
tblFleetMix	HHD	9.6790e-003	0.03
tblFleetMix	LDA	0.60	0.57
tblFleetMix	LDA	0.60	0.57
tblFleetMix	LDT1	0.04	0.06
tblFleetMix	LDT1	0.04	0.06
tblFleetMix	LDT2	0.19	0.18
tblFleetMix	LDT2	0.19	0.18
tblFleetMix	LHD1	0.01	0.02
tblFleetMix	LHD1	0.01	0.02
tblFleetMix	LHD2	5.2680e-003	5.9030e-003
tblFleetMix	LHD2	5.2680e-003	5.9030e-003
tblFleetMix	MCY	5.7550e-003	5.4650e-003
tblFleetMix	MCY	5.7550e-003	5.4650e-003
tblFleetMix	MDV	0.09	0.11

tblFleetMix	MDV	0.09	0.11
tblFleetMix	MH	5.9500e-004	7.5700e-004
tblFleetMix	MH	5.9500e-004	7.5700e-004
tblFleetMix	MHD	0.03	0.02
tblFleetMix	MHD	0.03	0.02
tblFleetMix	OBUS	4.2840e-003	1.6410e-003
tblFleetMix	OBUS	4.2840e-003	1.6410e-003
tblFleetMix	SBUS	9.5800e-004	9.3700e-004
tblFleetMix	SBUS	9.5800e-004	9.3700e-004
tblFleetMix	UBUS	2.3520e-003	1.5500e-003
tblFleetMix	UBUS	2.3520e-003	1.5500e-003
tblLandUse	LotAcreage	6.20	2.50
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblRoadDust	RoadSiltLoading	0.1	0.048
tblVehicleEF	HHD	0.37	0.02
tblVehicleEF	HHD	0.41	0.05
tblVehicleEF	HHD	0.05	0.00
tblVehicleEF	HHD	1.35	6.22
tblVehicleEF	HHD	2.54	0.41
tblVehicleEF	HHD	5.94	6.5970e-003
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tblVehicleEF	HHD	1,772.68	1,226.16
tblVehicleEF	HHD	18.00	0.06
tblVehicleEF	HHD	13.06	5.15
tblVehicleEF	HHD	2.21	2.51
tblVehicleEF	HHD	18.39	2.35
tblVehicleEF	HHD	0.01	2.1390e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.03	0.04

tblVehicleEF	HHD	6.7380e-003	0.02
tblVehicleEF	HHD	2.0500e-004	1.0000e-006
tblVehicleEF	HHD	0.01	2.0460e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.5330e-003	8.8850e-003
tblVehicleEF	HHD	6.4450e-003	0.02
tblVehicleEF	HHD	1.8800e-004	0.00
tblVehicleEF	HHD	1.1400e-004	1.0000e-006
tblVehicleEF	HHD	5.8060e-003	7.1000e-005
tblVehicleEF	HHD	0.30	0.42
tblVehicleEF	HHD	8.6000e-005	1.0000e-006
tblVehicleEF	HHD	0.09	0.02
tblVehicleEF	HHD	9.6700e-004	3.6600e-004
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tblVehicleEF	HHD	0.01	0.01
tblVehicleEF	HHD	2.7600e-004	1.0000e-006
tblVehicleEF	HHD	1.1400e-004	1.0000e-006
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tblVehicleEF	HHD	8.6000e-005	1.0000e-006
tblVehicleEF	HHD	0.51	0.07
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tblVehicleEF	LDA	42.27	42.52

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tblVehicleEF	LDA	0.03	0.13
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tblVehicleEF	LDA	1.6800e-003	1.1830e-003
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tblVehicleEF	LDA	0.06	0.07
tblVehicleEF	LDA	0.02	0.02
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tblVehicleEF	LDA	0.06	0.07
tblVehicleEF	LDA	0.02	0.02
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tblVehicleEF	LDA	0.04	0.17
tblVehicleEF	LDA	0.03	0.14
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tblVehicleEF	LDT1	1.05	1.86
tblVehicleEF	LDT1	257.11	244.39
tblVehicleEF	LDT1	54.94	51.84
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tblVehicleEF	LDT1	0.05	0.16
tblVehicleEF	LDT1	1.7140e-003	1.0830e-003
tblVehicleEF	LDT1	2.1190e-003	1.4820e-003

tblVehicleEF	LDT1	1.5770e-003	9.9600e-004
tblVehicleEF	LDT1	1.9490e-003	1.3630e-003
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tblVehicleEF	LDT1	0.10	0.10
tblVehicleEF	LDT1	0.03	0.04
tblVehicleEF	LDT1	8.6320e-003	6.4090e-003
tblVehicleEF	LDT1	0.09	0.38
tblVehicleEF	LDT1	0.05	0.16
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tblVehicleEF	LDT1	5.6700e-004	5.1300e-004
tblVehicleEF	LDT1	0.03	0.04
tblVehicleEF	LDT1	0.10	0.10
tblVehicleEF	LDT1	0.03	0.04
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tblVehicleEF	LDT1	0.06	0.18
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tblVehicleEF	LDT2	0.50	0.53
tblVehicleEF	LDT2	0.87	2.28
tblVehicleEF	LDT2	291.96	251.38
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tblVehicleEF	LDT2	0.05	0.17
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tblVehicleEF	LDT2	0.06	0.09

tblVehicleEF	LDT2	0.03	0.05
tblVehicleEF	LDT2	8.4410e-003	6.2060e-003
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tblVehicleEF	LDT2	6.2500e-004	5.3100e-004
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tblVehicleEF	LDT2	0.06	0.09
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tblVehicleEF	LDT2	0.01	9.0140e-003
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tblVehicleEF	LDT2	0.04	0.20
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tblVehicleEF	LHD1	0.06	0.05
tblVehicleEF	LHD1	0.34	0.37
tblVehicleEF	LHD1	0.73	0.23
tblVehicleEF	LHD1	7.0700e-004	9.2900e-004
tblVehicleEF	LHD1	0.01	9.9180e-003
tblVehicleEF	LHD1	8.4250e-003	7.8050e-003
tblVehicleEF	LHD1	6.1200e-004	2.1000e-004
tblVehicleEF	LHD1	6.7600e-004	8.8900e-004
tblVehicleEF	LHD1	2.5800e-003	2.4790e-003

tblVehicleEF	LHD1	8.0280e-003	7.4230e-003
tblVehicleEF	LHD1	5.6300e-004	1.9300e-004
tblVehicleEF	LHD1	1.4480e-003	1.3190e-003
tblVehicleEF	LHD1	0.07	0.06
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	1.0100e-003	7.7900e-004
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tblVehicleEF	LHD1	0.24	0.46
tblVehicleEF	LHD1	0.14	0.04
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tblVehicleEF	LHD1	0.02	0.02
tblVehicleEF	LHD1	1.0100e-003	7.7900e-004
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tblVehicleEF	LHD1	0.24	0.46
tblVehicleEF	LHD1	0.16	0.05
tblVehicleEF	LHD2	2.5500e-003	2.5800e-003
tblVehicleEF	LHD2	5.2880e-003	5.3930e-003
tblVehicleEF	LHD2	3.1530e-003	5.0230e-003
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.45	0.50
tblVehicleEF	LHD2	0.90	0.49
tblVehicleEF	LHD2	13.59	13.05
tblVehicleEF	LHD2	675.88	686.39
tblVehicleEF	LHD2	21.97	6.59
tblVehicleEF	LHD2	0.07	0.08
tblVehicleEF	LHD2	0.18	0.42

tblVehicleEF	LHD2	0.26	0.13
tblVehicleEF	LHD2	1.0400e-003	1.4850e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	9.0950e-003	0.01
tblVehicleEF	LHD2	3.7200e-004	1.0500e-004
tblVehicleEF	LHD2	9.9500e-004	1.4200e-003
tblVehicleEF	LHD2	2.7070e-003	2.7080e-003
tblVehicleEF	LHD2	8.6790e-003	0.01
tblVehicleEF	LHD2	3.4200e-004	9.6000e-005
tblVehicleEF	LHD2	4.2200e-004	6.0600e-004
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	3.0400e-004	3.8500e-004
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tblVehicleEF	LHD2	0.04	0.15
tblVehicleEF	LHD2	0.04	0.02
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tblVehicleEF	LHD2	4.2200e-004	6.0600e-004
tblVehicleEF	LHD2	0.02	0.03
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	3.0400e-004	3.8500e-004
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tblVehicleEF	LHD2	0.04	0.15
tblVehicleEF	LHD2	0.05	0.03
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tblVehicleEF	MCY	0.16	0.25
tblVehicleEF	MCY	19.33	18.37
tblVehicleEF	MCY	10.34	9.28

tblVehicleEF	MCY	194.99	213.76
tblVehicleEF	MCY	43.81	59.74
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tblVehicleEF	MCY	0.32	0.27
tblVehicleEF	MCY	2.6910e-003	2.2080e-003
tblVehicleEF	MCY	3.2940e-003	2.8780e-003
tblVehicleEF	MCY	2.5100e-003	2.0600e-003
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tblVehicleEF	MCY	0.76	0.81
tblVehicleEF	MCY	0.68	0.64
tblVehicleEF	MCY	0.47	0.46
tblVehicleEF	MCY	2.71	2.22
tblVehicleEF	MCY	0.60	1.55
tblVehicleEF	MCY	2.17	1.91
tblVehicleEF	MCY	2.3490e-003	2.1150e-003
tblVehicleEF	MCY	6.7100e-004	5.9100e-004
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tblVehicleEF	MCY	0.68	0.64
tblVehicleEF	MCY	0.47	0.46
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tblVehicleEF	MDV	5.0390e-003	0.04
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tblVehicleEF	MDV	1.20	2.33
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tblVehicleEF	MDV	79.93	63.72
tblVehicleEF	MDV	0.05	0.03
tblVehicleEF	MDV	0.08	0.18

tblVehicleEF	MDV	1.7260e-003	1.0420e-003
tblVehicleEF	MDV	2.0190e-003	1.3490e-003
tblVehicleEF	MDV	1.5890e-003	9.6000e-004
tblVehicleEF	MDV	1.8570e-003	1.2400e-003
tblVehicleEF	MDV	0.04	0.05
tblVehicleEF	MDV	0.10	0.10
tblVehicleEF	MDV	0.04	0.06
tblVehicleEF	MDV	0.01	6.7610e-003
tblVehicleEF	MDV	0.09	0.34
tblVehicleEF	MDV	0.07	0.20
tblVehicleEF	MDV	3.8830e-003	3.0040e-003
tblVehicleEF	MDV	8.1900e-004	6.3100e-004
tblVehicleEF	MDV	0.04	0.05
tblVehicleEF	MDV	0.10	0.10
tblVehicleEF	MDV	0.04	0.06
tblVehicleEF	MDV	0.02	9.7950e-003
tblVehicleEF	MDV	0.09	0.34
tblVehicleEF	MDV	0.07	0.22
tblVehicleEF	MH	5.3570e-003	5.0570e-003
tblVehicleEF	MH	0.01	0.02
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tblVehicleEF	MH	3.30	1.63
tblVehicleEF	MH	1,173.64	1,351.69
tblVehicleEF	MH	55.96	15.45
tblVehicleEF	MH	0.66	1.09
tblVehicleEF	MH	0.53	0.24
tblVehicleEF	MH	0.01	0.01
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tblVehicleEF	MH	8.7800e-004	2.0900e-004
tblVehicleEF	MH	3.2210e-003	3.3000e-003

tblVehicleEF	MH	5.9410e-003	0.02
tblVehicleEF	MH	8.0700e-004	1.9300e-004
tblVehicleEF	MH	0.22	0.31
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	0.11	0.13
tblVehicleEF	MH	0.03	0.04
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tblVehicleEF	MH	0.19	0.07
tblVehicleEF	MH	0.01	0.01
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tblVehicleEF	MH	0.22	0.31
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	0.11	0.13
tblVehicleEF	MH	0.03	0.05
tblVehicleEF	MH	5.2010e-003	0.51
tblVehicleEF	MH	0.21	0.08
tblVehicleEF	MHD	0.02	3.2270e-003
tblVehicleEF	MHD	2.3960e-003	9.3800e-004
tblVehicleEF	MHD	0.03	7.0270e-003
tblVehicleEF	MHD	0.27	0.40
tblVehicleEF	MHD	0.24	0.15
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tblVehicleEF	MHD	13.41	1.78
tblVehicleEF	MHD	7.3000e-005	1.6900e-004
tblVehicleEF	MHD	3.0120e-003	6.9630e-003

tblVehicleEF	MHD	5.2800e-004	9.0000e-005
tblVehicleEF	MHD	6.9000e-005	1.6100e-004
tblVehicleEF	MHD	2.8790e-003	6.6560e-003
tblVehicleEF	MHD	4.8600e-004	8.3000e-005
tblVehicleEF	MHD	4.9900e-004	2.2800e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	3.6000e-004	1.4600e-004
tblVehicleEF	MHD	0.04	0.01
tblVehicleEF	MHD	0.01	0.06
tblVehicleEF	MHD	0.18	0.03
tblVehicleEF	MHD	1.6440e-003	6.6800e-004
tblVehicleEF	MHD	0.01	9.2240e-003
tblVehicleEF	MHD	4.6500e-004	7.0000e-005
tblVehicleEF	MHD	4.9900e-004	2.2800e-004
tblVehicleEF	MHD	0.03	0.01
tblVehicleEF	MHD	0.03	0.02
tblVehicleEF	MHD	3.6000e-004	1.4600e-004
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	0.01	0.06
tblVehicleEF	MHD	0.19	0.04
tblVehicleEF	OBUS	0.01	7.3320e-003
tblVehicleEF	OBUS	3.7320e-003	2.4610e-003
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.24	0.69
tblVehicleEF	OBUS	0.33	0.29
tblVehicleEF	OBUS	3.91	1.68
tblVehicleEF	OBUS	177.72	102.80
tblVehicleEF	OBUS	1,291.13	1,219.51
tblVehicleEF	OBUS	60.36	14.05

tblVehicleEF	OBUS	0.42	0.46
tblVehicleEF	OBUS	1.09	1.41
tblVehicleEF	OBUS	4.24	1.11
tblVehicleEF	OBUS	3.8000e-005	1.5300e-004
tblVehicleEF	OBUS	3.2850e-003	8.0870e-003
tblVehicleEF	OBUS	7.7100e-004	1.5700e-004
tblVehicleEF	OBUS	3.7000e-005	1.4600e-004
tblVehicleEF	OBUS	3.1300e-003	7.7230e-003
tblVehicleEF	OBUS	7.0800e-004	1.4500e-004
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.03	0.05
tblVehicleEF	OBUS	6.1100e-004	5.3900e-004
tblVehicleEF	OBUS	0.05	0.02
tblVehicleEF	OBUS	0.03	0.21
tblVehicleEF	OBUS	0.25	0.08
tblVehicleEF	OBUS	1.7060e-003	9.7600e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.7200e-004	1.3900e-004
tblVehicleEF	OBUS	0.02	0.02
tblVehicleEF	OBUS	0.05	0.07
tblVehicleEF	OBUS	6.1100e-004	5.3900e-004
tblVehicleEF	OBUS	0.06	0.02
tblVehicleEF	OBUS	0.03	0.21
tblVehicleEF	OBUS	0.28	0.09
tblVehicleEF	SBUS	0.80	0.06
tblVehicleEF	SBUS	5.4460e-003	3.4080e-003
tblVehicleEF	SBUS	0.05	4.8910e-003
tblVehicleEF	SBUS	8.40	2.56
tblVehicleEF	SBUS	0.36	0.29
tblVehicleEF	SBUS	6.39	0.68

tblVehicleEF	SBUS	1,047.94	316.42
tblVehicleEF	SBUS	1,034.23	936.84
tblVehicleEF	SBUS	59.56	3.97
tblVehicleEF	SBUS	4.56	2.32
tblVehicleEF	SBUS	1.78	2.57
tblVehicleEF	SBUS	11.19	1.41
tblVehicleEF	SBUS	2.2950e-003	1.5510e-003
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	8.8570e-003	0.02
tblVehicleEF	SBUS	8.6200e-004	5.9000e-005
tblVehicleEF	SBUS	2.1950e-003	1.4840e-003
tblVehicleEF	SBUS	2.6250e-003	2.7130e-003
tblVehicleEF	SBUS	8.4590e-003	0.02
tblVehicleEF	SBUS	7.9200e-004	5.4000e-005
tblVehicleEF	SBUS	3.4880e-003	5.4600e-004
tblVehicleEF	SBUS	0.04	5.4730e-003
tblVehicleEF	SBUS	0.99	0.26
tblVehicleEF	SBUS	2.0090e-003	2.7600e-004
tblVehicleEF	SBUS	0.06	0.05
tblVehicleEF	SBUS	0.02	0.04
tblVehicleEF	SBUS	0.36	0.03
tblVehicleEF	SBUS	0.01	3.0130e-003
tblVehicleEF	SBUS	9.9770e-003	8.9520e-003
tblVehicleEF	SBUS	7.0600e-004	3.9000e-005
tblVehicleEF	SBUS	3.4880e-003	5.4600e-004
tblVehicleEF	SBUS	0.04	5.4730e-003
tblVehicleEF	SBUS	1.44	0.38
tblVehicleEF	SBUS	2.0090e-003	2.7600e-004
tblVehicleEF	SBUS	0.07	0.06
tblVehicleEF	SBUS	0.02	0.04

tblVehicleEF	SBUS	0.39	0.03
tblVehicleEF	UBUS	0.26	1.76
tblVehicleEF	UBUS	0.04	4.9700e-003
tblVehicleEF	UBUS	4.60	13.30
tblVehicleEF	UBUS	6.49	0.42
tblVehicleEF	UBUS	2,090.87	1,631.09
tblVehicleEF	UBUS	92.50	4.00
tblVehicleEF	UBUS	9.35	0.68
tblVehicleEF	UBUS	15.33	0.04
tblVehicleEF	UBUS	0.62	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	0.18	4.9500e-003
tblVehicleEF	UBUS	1.0140e-003	5.0000e-005
tblVehicleEF	UBUS	0.27	0.03
tblVehicleEF	UBUS	3.0000e-003	7.8890e-003
tblVehicleEF	UBUS	0.17	4.7320e-003
tblVehicleEF	UBUS	9.3200e-004	4.6000e-005
tblVehicleEF	UBUS	1.9840e-003	1.4800e-004
tblVehicleEF	UBUS	0.04	1.8210e-003
tblVehicleEF	UBUS	1.3390e-003	8.8000e-005
tblVehicleEF	UBUS	0.56	0.03
tblVehicleEF	UBUS	0.01	9.4860e-003
tblVehicleEF	UBUS	0.55	0.02
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	1.0430e-003	4.0000e-005
tblVehicleEF	UBUS	1.9840e-003	1.4800e-004
tblVehicleEF	UBUS	0.04	1.8210e-003
tblVehicleEF	UBUS	1.3390e-003	8.8000e-005
tblVehicleEF	UBUS	0.87	1.79
tblVehicleEF	UBUS	0.01	9.4860e-003

tblVehicleEF	UBUS	0.60	0.02
tblVehicleTrips	CC_TL	7.30	23.80
tblVehicleTrips	CNW_TL	7.30	14.00
tblVehicleTrips	CW_TL	9.50	17.00
tblVehicleTrips	DV_TP	11.00	0.00
tblVehicleTrips	DV_TP	15.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	86.00	100.00
tblVehicleTrips	PR_TP	82.00	100.00
tblVehicleTrips	ST_TR	4.98	1.04
tblVehicleTrips	ST_TR	1.90	9.58
tblVehicleTrips	SU_TR	3.65	1.04
tblVehicleTrips	SU_TR	1.11	9.58
tblVehicleTrips	WD_TR	4.20	1.04
tblVehicleTrips	WD_TR	8.11	9.58
tblWoodstoves	NumberCatalytic	2.84	0.00
tblWoodstoves	NumberNoncatalytic	2.84	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.8815	0.0121	1.0541	6.0000e-005		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003	0.0000	1.7271	1.7271	1.6500e-003	0.0000	1.7685

Energy	0.0427	0.3847	0.2995	2.3300e-003		0.0295	0.0295		0.0295	0.0295	0.0000	422.7599	422.7599	8.1000e-003	7.7500e-003	425.2721
Mobile	1.0039	3.3954	13.9250	0.0590	4.1129	0.0431	4.1560	1.1678	0.0404	1.2082	0.0000	5,499.5411	5,499.5411	0.1688	0.0000	5,503.7601
Waste						0.0000	0.0000		0.0000	0.0000	17.4247	0.0000	17.4247	1.0298	0.0000	43.1691
Water						0.0000	0.0000		0.0000	0.0000	45.0530	0.0000	45.0530	4.6274	0.1093	193.2975
Total	**2.9282**	**3.7923**	**15.2786**	**0.0614**	**4.1129**	**0.0784**	**4.1913**	**1.1678**	**0.0758**	**1.2436**	**62.4777**	**5,924.0281**	**5,986.5059**	**5.8357**	**0.1170**	**6,167.2673**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.8815	0.0121	1.0541	6.0000e-005		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003	0.0000	1.7271	1.7271	1.6500e-003	0.0000	1.7685
Energy	0.0427	0.3847	0.2995	2.3300e-003		0.0295	0.0295		0.0295	0.0295	0.0000	422.7599	422.7599	8.1000e-003	7.7500e-003	425.2721
Mobile	1.0039	3.3954	13.9250	0.0590	4.1129	0.0431	4.1560	1.1678	0.0404	1.2082	0.0000	5,499.5411	5,499.5411	0.1688	0.0000	5,503.7601
Waste						0.0000	0.0000		0.0000	0.0000	17.4247	0.0000	17.4247	1.0298	0.0000	43.1691
Water						0.0000	0.0000		0.0000	0.0000	45.0530	0.0000	45.0530	4.6274	0.1093	193.2975
Total	**2.9282**	**3.7923**	**15.2786**	**0.0614**	**4.1129**	**0.0784**	**4.1913**	**1.1678**	**0.0758**	**1.2436**	**62.4777**	**5,924.0281**	**5,986.5059**	**5.8357**	**0.1170**	**6,167.2673**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	12/10/2019	12/16/2019	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.0039	3.3954	13.9250	0.0590	4.1129	0.0431	4.1560	1.1678	0.0404	1.2082	0.0000	5,499.5411	5,499.5411	0.1688	0.0000	5,503.7601
Unmitigated	1.0039	3.3954	13.9250	0.0590	4.1129	0.0431	4.1560	1.1678	0.0404	1.2082	0.0000	5,499.5411	5,499.5411	0.1688	0.0000	5,503.7601

4.2 Trip Summary Information

	Average Daily Trip Rate	Unmitigated	Mitigated

Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments High Rise	147.68	147.68	147.68	384,137	384,137
Research & Development	2,586.60	2,586.60	2586.60	18,542,342	18,542,342
Total	2,734.28	2,734.28	2,734.28	18,926,479	18,926,479

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments High Rise	10.80	4.80	5.70	31.00	15.00	54.00	100	0	0
Research & Development	17.00	23.80	14.00	33.00	48.00	19.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments High Rise	0.567441	0.056499	0.177800	0.113094	0.022543	0.005903	0.019048	0.027325	0.001641	0.001550	0.005465	0.000937	0.000757
Research & Development	0.567441	0.056499	0.177800	0.113094	0.022543	0.005903	0.019048	0.027325	0.001641	0.001550	0.005465	0.000937	0.000757

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0427	0.3847	0.2995	2.3300e-003		0.0295	0.0295		0.0295	0.0295	0.0000	422.7599	422.7599	8.1000e-003	7.7500e-003	425.2721

NaturalGas Unmitigated	0.0427	0.3847	0.2995	2.3300e-003		0.0295	0.0295		0.0295	0.0295	0.0000	422.7599	422.7599	8.1000e-003	7.7500e-003	425.2721	

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments High Rise	1.23972e+006	6.6800e-003	0.0571	0.0243	3.6000e-004		4.6200e-003	4.6200e-003		4.6200e-003	4.6200e-003	0.0000	66.1562	66.1562	1.2700e-003	1.2100e-003	66.5494
Research & Development	6.6825e+006	0.0360	0.3276	0.2752	1.9700e-003		0.0249	0.0249		0.0249	0.0249	0.0000	356.6037	356.6037	6.8300e-003	6.5400e-003	358.7228
Total		**0.0427**	**0.3847**	**0.2995**	**2.3300e-003**		**0.0295**	**0.0295**		**0.0295**	**0.0295**	**0.0000**	**422.7599**	**422.7599**	**8.1000e-003**	**7.7500e-003**	**425.2721**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments High Rise	1.23972e+006	6.6800e-003	0.0571	0.0243	3.6000e-004		4.6200e-003	4.6200e-003		4.6200e-003	4.6200e-003	0.0000	66.1562	66.1562	1.2700e-003	1.2100e-003	66.5494
Research & Development	6.6825e+006	0.0360	0.3276	0.2752	1.9700e-003		0.0249	0.0249		0.0249	0.0249	0.0000	356.6037	356.6037	6.8300e-003	6.5400e-003	358.7228
Total		**0.0427**	**0.3847**	**0.2995**	**2.3300e-003**		**0.0295**	**0.0295**		**0.0295**	**0.0295**	**0.0000**	**422.7599**	**422.7599**	**8.1000e-003**	**7.7500e-003**	**425.2721**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	0	0.0000	0.0000	0.0000	0.0000
Research & Development	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	0	0.0000	0.0000	0.0000	0.0000
Research & Development	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Mitigated	1.8815	0.0121	1.0541	6.0000e-005		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003	0.0000	1.7271	1.7271	1.6500e-003	0.0000	1.7685
Unmitigated	1.8815	0.0121	1.0541	6.0000e-005		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003	0.0000	1.7271	1.7271	1.6500e-003	0.0000	1.7685

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2408					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.6091					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0317	0.0121	1.0541	6.0000e-005		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003	0.0000	1.7271	1.7271	1.6500e-003	0.0000	1.7685
Total	**1.8815**	**0.0121**	**1.0541**	**6.0000e-005**		**5.8600e-003**	**5.8600e-003**		**5.8600e-003**	**5.8600e-003**	**0.0000**	**1.7271**	**1.7271**	**1.6500e-003**	**0.0000**	**1.7685**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2408					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Consumer Products	1.6091					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0317	0.0121	1.0541	6.0000e-005		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003	0.0000	1.7271	1.7271	1.6500e-003	0.0000	1.7685
Total	**1.8815**	**0.0121**	**1.0541**	**6.0000e-005**		**5.8600e-003**	**5.8600e-003**		**5.8600e-003**	**5.8600e-003**	**0.0000**	**1.7271**	**1.7271**	**1.6500e-003**	**0.0000**	**1.7685**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	45.0530	4.6274	0.1093	193.2975
Unmitigated	45.0530	4.6274	0.1093	193.2975

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	9.25187 / 5.8327	2.9352	0.3015	7.1200e-003	12.5933

Research & Development	132.757 / 0	42.1178	4.3259	0.1021	180.7042
Total		**45.0530**	**4.6274**	**0.1093**	**193.2975**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	9.25187 / 5.8327	2.9352	0.3015	7.1200e-003	12.5933
Research & Development	132.757 / 0	42.1178	4.3259	0.1021	180.7042
Total		**45.0530**	**4.6274**	**0.1093**	**193.2975**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	17.4247	1.0298	0.0000	43.1691
Unmitigated	17.4247	1.0298	0.0000	43.1691

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	65.32	13.2594	0.7836	0.0000	32.8495
Research & Development	20.52	4.1654	0.2462	0.0000	10.3195
Total		**17.4247**	**1.0298**	**0.0000**	**43.1691**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	65.32	13.2594	0.7836	0.0000	32.8495
Research & Development	20.52	4.1654	0.2462	0.0000	10.3195
Total		**17.4247**	**1.0298**	**0.0000**	**43.1691**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Initial Phase Aldea Energy Only - San Francisco County, Annual

Initial Phase Aldea Energy Only

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments High Rise	184.00	Dwelling Unit	2.97	184,000.00	526

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2031
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	605.78	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - UCSF Specific CO2 factor

Land Use -

Construction Phase -

Off-road Equipment - Operational energy run only

Trips and VMT - Operational energy run only

Vehicle Trips - Operational energy run only

Woodstoves - No hearths in student apartments

Energy Use -

Table Name	Column Name	Default Value	New Value

tblFireplaces	NumberGas	27.60	0.00
tblFireplaces	NumberWood	31.28	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	0	605.78
tblTripsAndVMT	WorkerTripNumber	26.00	0.00
tblVehicleTrips	ST_TR	4.98	0.00
tblVehicleTrips	SU_TR	3.65	0.00
tblVehicleTrips	WD_TR	4.20	0.00
tblWoodstoves	NumberCatalytic	3.68	0.00
tblWoodstoves	NumberNoncatalytic	3.68	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	1.2953	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**1.2953**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	tons/yr										MT/yr					
2020	1.2953	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**1.2953**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8889	0.0157	1.3626	7.0000e-005		7.5800e-003	7.5800e-003		7.5800e-003	7.5800e-003	0.0000	2.2317	2.2317	2.1300e-003	0.0000	2.2849
Energy	8.6600e-003	0.0740	0.0315	4.7000e-004		5.9800e-003	5.9800e-003		5.9800e-003	5.9800e-003	0.0000	299.1832	299.1832	1.6400e-003	1.5700e-003	299.6926
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	17.1812	0.0000	17.1812	1.0154	0.0000	42.5656
Water						0.0000	0.0000		0.0000	0.0000	3.8034	25.0931	28.8964	0.3906	9.2200e-003	41.4111
Total	**0.8976**	**0.0897**	**1.3941**	**5.4000e-004**	**0.0000**	**0.0136**	**0.0136**	**0.0000**	**0.0136**	**0.0136**	**20.9845**	**326.5079**	**347.4924**	**1.4098**	**0.0108**	**385.9541**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8889	0.0157	1.3626	7.0000e-005		7.5800e-003	7.5800e-003		7.5800e-003	7.5800e-003	0.0000	2.2317	2.2317	2.1300e-003	0.0000	2.2849
Energy	8.6600e-003	0.0740	0.0315	4.7000e-004		5.9800e-003	5.9800e-003		5.9800e-003	5.9800e-003	0.0000	299.1832	299.1832	1.6400e-003	1.5700e-003	299.6926
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	17.1812	0.0000	17.1812	1.0154	0.0000	42.5656
Water						0.0000	0.0000		0.0000	0.0000	3.8034	25.0931	28.8964	0.3906	9.2200e-003	41.4111
Total	**0.8976**	**0.0897**	**1.3941**	**5.4000e-004**	**0.0000**	**0.0136**	**0.0136**	**0.0000**	**0.0136**	**0.0136**	**20.9845**	**326.5079**	**347.4924**	**1.4098**	**0.0108**	**385.9541**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Architectural Coating	Architectural Coating	10/28/2020	11/10/2020	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 372,600; Residential Outdoor: 124,200; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	0	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.2953					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.2953**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.2953					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.2953**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments High Rise	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-...	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments High Rise	10.80	4.80	5.70	31.00	15.00	54.00	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments High Rise	0.601973	0.036168	0.193150	0.092307	0.012222	0.005292	0.035273	0.009746	0.004298	0.002300	0.005708	0.000958	0.000606

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	213.4596	213.4596	0.0000	0.0000	213.4596
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	213.4596	213.4596	0.0000	0.0000	213.4596
NaturalGas Mitigated	8.6600e-003	0.0740	0.0315	4.7000e-004		5.9800e-003	5.9800e-003		5.9800e-003	5.9800e-003	0.0000	85.7236	85.7236	1.6400e-003	1.5700e-003	86.2330
NaturalGas Unmitigated	8.6600e-003	0.0740	0.0315	4.7000e-004		5.9800e-003	5.9800e-003		5.9800e-003	5.9800e-003	0.0000	85.7236	85.7236	1.6400e-003	1.5700e-003	86.2330

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments High Rise	1.6064e+006	8.6600e-003	0.0740	0.0315	4.7000e-004		5.9800e-003	5.9800e-003		5.9800e-003	5.9800e-003	0.0000	85.7236	85.7236	1.6400e-003	1.5700e-003	86.2330
Total		**8.6600e-003**	**0.0740**	**0.0315**	**4.7000e-004**		**5.9800e-003**	**5.9800e-003**		**5.9800e-003**	**5.9800e-003**	**0.0000**	**85.7236**	**85.7236**	**1.6400e-003**	**1.5700e-003**	**86.2330**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments High Rise	1.6064e+006	8.6600e-003	0.0740	0.0315	4.7000e-004		5.9800e-003	5.9800e-003		5.9800e-003	5.9800e-003	0.0000	85.7236	85.7236	1.6400e-003	1.5700e-003	86.2330
Total		**8.6600e-003**	**0.0740**	**0.0315**	**4.7000e-004**		**5.9800e-003**	**5.9800e-003**		**5.9800e-003**	**5.9800e-003**	**0.0000**	**85.7236**	**85.7236**	**1.6400e-003**	**1.5700e-003**	**86.2330**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	776846	213.4596	0.0000	0.0000	213.4596
Total		**213.4596**	**0.0000**	**0.0000**	**213.4596**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments High Rise	776846	213.4596	0.0000	0.0000	213.4596

Total		**213.4596**	**0.0000**	**0.0000**	**213.4596**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.8889	0.0157	1.3626	7.0000e-005		7.5800e-003	7.5800e-003		7.5800e-003	7.5800e-003	0.0000	2.2317	2.2317	2.1300e-003	0.0000	2.2849
Unmitigated	0.8889	0.0157	1.3626	7.0000e-005		7.5800e-003	7.5800e-003		7.5800e-003	7.5800e-003	0.0000	2.2317	2.2317	2.1300e-003	0.0000	2.2849

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1295					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7186					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Landscaping	0.0408	0.0157	1.3626	7.0000e-005		7.5800e-003	7.5800e-003		7.5800e-003	7.5800e-003	0.0000	2.2317	2.2317	2.1300e-003	0.0000	2.2849
Total	**0.8889**	**0.0157**	**1.3626**	**7.0000e-005**		**7.5800e-003**	**7.5800e-003**		**7.5800e-003**	**7.5800e-003**	**0.0000**	**2.2317**	**2.2317**	**2.1300e-003**	**0.0000**	**2.2849**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1295					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7186					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0408	0.0157	1.3626	7.0000e-005		7.5800e-003	7.5800e-003		7.5800e-003	7.5800e-003	0.0000	2.2317	2.2317	2.1300e-003	0.0000	2.2849
Total	**0.8889**	**0.0157**	**1.3626**	**7.0000e-005**		**7.5800e-003**	**7.5800e-003**		**7.5800e-003**	**7.5800e-003**	**0.0000**	**2.2317**	**2.2317**	**2.1300e-003**	**0.0000**	**2.2849**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	28.8964	0.3906	9.2200e-003	41.4111
Unmitigated	28.8964	0.3906	9.2200e-003	41.4111

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	11.9883 / 7.55787	28.8964	0.3906	9.2200e-003	41.4111
Total		**28.8964**	**0.3906**	**9.2200e-003**	**41.4111**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments High Rise	11.9883 / 7.55787	28.8964	0.3906	9.2200e-003	41.4111
Total		**28.8964**	**0.3906**	**9.2200e-003**	**41.4111**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	17.1812	1.0154	0.0000	42.5656
Unmitigated	17.1812	1.0154	0.0000	42.5656

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments High Rise	84.64	17.1812	1.0154	0.0000	42.5656
Total		**17.1812**	**1.0154**	**0.0000**	**42.5656**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

Apartments High Rise	84.64	17.1812	1.0154	0.0000	42.5656
Total		**17.1812**	**1.0154**	**0.0000**	**42.5656**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

RAB Energy Emissions Only - San Francisco County, Annual

RAB Energy Emissions Only

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Research & Development	271.00	1000sqft	6.22	271,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2026
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	605.78	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - UCSF-specific CO2 factor. N/A due to net zero by 2025 Policy

Land Use -

Construction Phase -

Off-road Equipment - operational only

Trips and VMT - operational run only

Vehicle Trips - Operational Energy run only for RAB. Mobile emission separate run with other initial phase projects

Energy Use - UCSF to meet 20% reduction over Title 24. ADjuste T24 demand 20%.

Table Name	Column Name	Default Value	New Value
tblEnergyUse	T24E	1.21	0.97

tblEnergyUse	T24NG	17.85	14.28
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	0	605.78
tblTripsAndVMT	WorkerTripNumber	17.00	0.00
tblVehicleTrips	ST_TR	1.90	0.00
tblVehicleTrips	SU_TR	1.11	0.00
tblVehicleTrips	WD_TR	8.11	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.4239	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2021	0.9892	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.9892**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.4239	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

2021	0.9892	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.9892**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
5	**10-31-2020**	**1-30-2021**	1.4131	1.4131
		Highest	1.4131	1.4131

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1999	2.0000e-005	2.4800e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8400e-003	4.8400e-003	1.0000e-005	0.0000	5.1600e-003
Energy	0.0310	0.2814	0.2363	1.6900e-003		0.0214	0.0214		0.0214	0.0214	0.0000	851.2286	851.2286	5.8700e-003	5.6200e-003	853.0488
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	4.1796	0.0000	4.1796	0.2470	0.0000	10.3547
Water						0.0000	0.0000		0.0000	0.0000	42.2738	198.1173	240.3911	4.3419	0.1025	379.4907
Total	**1.2309**	**0.2814**	**0.2388**	**1.6900e-003**	**0.0000**	**0.0214**	**0.0214**	**0.0000**	**0.0214**	**0.0214**	**46.4534**	**1,049.3507**	**1,095.8041**	**4.5948**	**0.1081**	**1,242.8994**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.1999	2.0000e-005	2.4800e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8400e-003	4.8400e-003	1.0000e-005	0.0000	5.1600e-003
Energy	0.0310	0.2814	0.2363	1.6900e-003		0.0214	0.0214		0.0214	0.0214	0.0000	851.2286	851.2286	5.8700e-003	5.6200e-003	853.0488
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	4.1796	0.0000	4.1796	0.2470	0.0000	10.3547
Water						0.0000	0.0000		0.0000	0.0000	42.2738	198.1173	240.3911	4.3419	0.1025	379.4907
Total	**1.2309**	**0.2814**	**0.2388**	**1.6900e-003**	**0.0000**	**0.0214**	**0.0214**	**0.0000**	**0.0214**	**0.0214**	**46.4534**	**1,049.3507**	**1,095.8041**	**4.5948**	**0.1081**	**1,242.8994**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Architectural Coating	Architectural Coating	12/24/2020	1/20/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 406,500; Non-Residential Outdoor: 135,500; Striped Parking Area:

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	0	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4239					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.4239**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4239					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.4239**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9892					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.9892**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Archit. Coating	0.9892					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.9892**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Research & Development	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Research & Development	9.50	7.30	7.30	33.00	48.00	19.00	82	15	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Research & Development	0.603873	0.037286	0.192865	0.090708	0.013128	0.005155	0.032618	0.009408	0.004276	0.003135	0.006045	0.000953	0.000549

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	544.9321	544.9321	0.0000	0.0000	544.9321

Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	544.9321	544.9321	0.0000	0.0000	544.9321
NaturalGas Mitigated	0.0310	0.2814	0.2363	1.6900e-003		0.0214	0.0214		0.0214	0.0214	0.0000	306.2965	306.2965	5.8700e-003	5.6200e-003	308.1167
NaturalGas Unmitigated	0.0310	0.2814	0.2363	1.6900e-003		0.0214	0.0214		0.0214	0.0214	0.0000	306.2965	306.2965	5.8700e-003	5.6200e-003	308.1167

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Research & Development	5.74E+06	0.0310	0.2814	0.2363	1.6900e-003		0.0214	0.0214		0.0214	0.0214	0.0000	306.2965	306.2965	5.8700e-003	5.6200e-003	308.1167
Total		**0.0310**	**0.2814**	**0.2363**	**1.6900e-003**		**0.0214**	**0.0214**		**0.0214**	**0.0214**	**0.0000**	**306.2965**	**306.2965**	**5.8700e-003**	**5.6200e-003**	**308.1167**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Research & Development	5.73978e+006	0.0310	0.2814	0.2363	1.6900e-003		0.0214	0.0214		0.0214	0.0214	0.0000	306.2965	306.2965	5.8700e-003	5.6200e-003	308.1167
Total		**0.0310**	**0.2814**	**0.2363**	**1.6900e-003**		**0.0214**	**0.0214**		**0.0214**	**0.0214**	**0.0000**	**306.2965**	**306.2965**	**5.8700e-003**	**5.6200e-003**	**308.1167**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Research & Development	1.98318e+006	544.9321	0.0000	0.0000	544.9321
Total		**544.9321**	**0.0000**	**0.0000**	**544.9321**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Research & Development	1.98318e+006	544.9321	0.0000	0.0000	544.9321
Total		**544.9321**	**0.0000**	**0.0000**	**544.9321**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.1999	2.0000e-005	2.4800e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8400e-003	4.8400e-003	1.0000e-005	0.0000	5.1600e-003
Unmitigated	1.1999	2.0000e-005	2.4800e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8400e-003	4.8400e-003	1.0000e-005	0.0000	5.1600e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1413					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0584					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.3000e-004	2.0000e-005	2.4800e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8400e-003	4.8400e-003	1.0000e-005	0.0000	5.1600e-003
Total	**1.1999**	**2.0000e-005**	**2.4800e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.8400e-003**	**4.8400e-003**	**1.0000e-005**	**0.0000**	**5.1600e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.1413					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0584					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Landscaping	2.3000e-004	2.0000e-005	2.4800e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	4.8400e-003	4.8400e-003	1.0000e-005	0.0000	5.1600e-003
Total	**1.1999**	**2.0000e-005**	**2.4800e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**4.8400e-003**	**4.8400e-003**	**1.0000e-005**	**0.0000**	**5.1600e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	240.3911	4.3419	0.1025	379.4907
Unmitigated	240.3911	4.3419	0.1025	379.4907

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Research & Development	133.249 / 0	240.3911	4.3419	0.1025	379.4907
Total		**240.3911**	**4.3419**	**0.1025**	**379.4907**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Research & Development	133.249 / 0	240.3911	4.3419	0.1025	379.4907
Total		**240.3911**	**4.3419**	**0.1025**	**379.4907**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	4.1796	0.2470	0.0000	10.3547
Unmitigated	4.1796	0.2470	0.0000	10.3547

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Research & Development	20.59	4.1796	0.2470	0.0000	10.3547
Total		**4.1796**	**0.2470**	**0.0000**	**10.3547**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Research & Development	20.59	4.1796	0.2470	0.0000	10.3547
Total		**4.1796**	**0.2470**	**0.0000**	**10.3547**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

CPHP Operational 2050 No Project

San Francisco County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Hospital	3,900.00	1000sqft	89.53	3,900,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	4.6	**Precipitation Freq (Days)**	64
Climate Zone	5			**Operational Year**	2050
Utility Company	User Defined				
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics - UCSF Net zero GHG electricity starting in 2025

Land Use - Operational Mobile source and area source only

Construction Phase - mobile source run only

Off-road Equipment - Operational Mobile Source Run only

Trips and VMT - Operational Run Only

Vehicle Trips - Trip rates adjusted to match daily VMT estimates of the Transportation Section

Vehicle Emission Factors - EMFAC 2017

Vehicle Emission Factors -

Vehicle Emission Factors -

Road Dust - CARB Method 7.9

Woodstoves -

Consumer Products - SF specific ROG Factor

Energy Use - Net xero electricity. Natural gas separate through CUP

Solid Waste - Adjusted rate to campus-specific wate to landfill in 2018.

Table Name	Column Name	Default Value	New Value
tblConsumerProducts	ROG_EF	2.14E-05	1.51E-05
tblEnergyUse	LightingElect	4.23	0.00
tblEnergyUse	NT24E	5.52	0.00
tblEnergyUse	NT24NG	15.80	0.00
tblEnergyUse	T24E	6.47	0.00
tblEnergyUse	T24NG	84.89	0.00
tblFleetMix	HHD	0.01	0.03
tblFleetMix	LDA	0.59	0.57
tblFleetMix	LDT1	0.04	0.06
tblFleetMix	LDT2	0.19	0.17
tblFleetMix	LHD1	0.01	0.02
tblFleetMix	LHD2	5.4090e-003	6.1250e-003
tblFleetMix	MCY	5.4800e-003	5.3500e-003
tblFleetMix	MDV	0.09	0.11
tblFleetMix	MH	6.8300e-004	7.6200e-004
tblFleetMix	MHD	0.04	0.02
tblFleetMix	OBUS	4.9020e-003	1.6650e-003
tblFleetMix	SBUS	9.2300e-004	1.0690e-003
tblFleetMix	UBUS	1.6050e-003	1.3540e-003
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblRoadDust	RoadSiltLoading	0.1	0.048
tblSolidWaste	SolidWasteGenerationRate	42,120.00	1,600.00

tblVehicleEF	HHD	0.28	0.02
tblVehicleEF	HHD	0.42	0.04
tblVehicleEF	HHD	0.05	0.00
tblVehicleEF	HHD	0.97	6.50
tblVehicleEF	HHD	2.63	0.40
tblVehicleEF	HHD	7.01	6.2370e-003
tblVehicleEF	HHD	2,799.48	828.78
tblVehicleEF	HHD	1,647.12	1,033.18
tblVehicleEF	HHD	20.36	0.05
tblVehicleEF	HHD	8.04	5.21
tblVehicleEF	HHD	1.34	2.43
tblVehicleEF	HHD	18.05	2.33
tblVehicleEF	HHD	9.7100e-004	1.8790e-003
tblVehicleEF	HHD	0.06	0.06
tblVehicleEF	HHD	0.03	0.04
tblVehicleEF	HHD	4.8370e-003	0.02
tblVehicleEF	HHD	2.5500e-004	1.0000e-006
tblVehicleEF	HHD	9.2900e-004	1.7980e-003
tblVehicleEF	HHD	0.03	0.03
tblVehicleEF	HHD	8.5490e-003	8.9000e-003
tblVehicleEF	HHD	4.6270e-003	0.02
tblVehicleEF	HHD	2.3400e-004	1.0000e-006
tblVehicleEF	HHD	1.6300e-004	2.0000e-006
tblVehicleEF	HHD	8.4180e-003	7.8000e-005
tblVehicleEF	HHD	0.22	0.43
tblVehicleEF	HHD	1.2700e-004	1.0000e-006
tblVehicleEF	HHD	0.08	0.02
tblVehicleEF	HHD	1.3420e-003	4.0400e-004
tblVehicleEF	HHD	0.12	0.00
tblVehicleEF	HHD	0.02	7.7220e-003

tblVehicleEF	HHD	0.01	9.4730e-003
tblVehicleEF	HHD	3.1700e-004	1.0000e-006
tblVehicleEF	HHD	1.6300e-004	2.0000e-006
tblVehicleEF	HHD	8.4180e-003	7.8000e-005
tblVehicleEF	HHD	0.28	0.50
tblVehicleEF	HHD	1.2700e-004	1.0000e-006
tblVehicleEF	HHD	0.51	0.06
tblVehicleEF	HHD	1.3420e-003	4.0400e-004
tblVehicleEF	HHD	0.13	0.00
tblVehicleEF	LDA	1.4270e-003	5.4400e-004
tblVehicleEF	LDA	4.8300e-004	0.02
tblVehicleEF	LDA	0.25	0.34
tblVehicleEF	LDA	0.31	1.35
tblVehicleEF	LDA	175.93	177.82
tblVehicleEF	LDA	34.59	35.86
tblVehicleEF	LDA	0.02	0.02
tblVehicleEF	LDA	9.7730e-003	0.11
tblVehicleEF	LDA	7.0000e-004	4.6800e-004
tblVehicleEF	LDA	7.8800e-004	6.0800e-004
tblVehicleEF	LDA	6.4400e-004	4.3100e-004
tblVehicleEF	LDA	7.2400e-004	5.5900e-004
tblVehicleEF	LDA	5.9710e-003	0.01
tblVehicleEF	LDA	0.03	0.03
tblVehicleEF	LDA	6.4660e-003	0.01
tblVehicleEF	LDA	3.6030e-003	1.5350e-003
tblVehicleEF	LDA	0.03	0.14
tblVehicleEF	LDA	6.5160e-003	0.06
tblVehicleEF	LDA	3.5000e-004	3.5500e-004
tblVehicleEF	LDA	5.9710e-003	0.01
tblVehicleEF	LDA	0.03	0.03

tblVehicleEF	LDA	6.4660e-003	0.01
tblVehicleEF	LDA	5.2320e-003	2.2240e-003
tblVehicleEF	LDA	0.03	0.14
tblVehicleEF	LDA	7.1350e-003	0.07
tblVehicleEF	LDT1	1.8690e-003	5.8000e-004
tblVehicleEF	LDT1	6.5000e-004	0.02
tblVehicleEF	LDT1	0.31	0.35
tblVehicleEF	LDT1	0.39	1.42
tblVehicleEF	LDT1	220.87	209.99
tblVehicleEF	LDT1	44.08	42.89
tblVehicleEF	LDT1	0.02	0.02
tblVehicleEF	LDT1	0.01	0.13
tblVehicleEF	LDT1	8.4300e-004	4.9300e-004
tblVehicleEF	LDT1	9.6700e-004	6.5500e-004
tblVehicleEF	LDT1	7.7500e-004	4.5400e-004
tblVehicleEF	LDT1	8.8900e-004	6.0200e-004
tblVehicleEF	LDT1	0.01	0.02
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.01	0.02
tblVehicleEF	LDT1	4.6360e-003	1.6150e-003
tblVehicleEF	LDT1	0.04	0.17
tblVehicleEF	LDT1	8.7710e-003	0.06
tblVehicleEF	LDT1	2.2100e-003	2.0780e-003
tblVehicleEF	LDT1	4.4600e-004	4.2400e-004
tblVehicleEF	LDT1	0.01	0.02
tblVehicleEF	LDT1	0.04	0.04
tblVehicleEF	LDT1	0.01	0.02
tblVehicleEF	LDT1	6.7610e-003	2.3560e-003
tblVehicleEF	LDT1	0.04	0.17
tblVehicleEF	LDT1	9.6030e-003	0.07

tblVehicleEF	LDT2	2.1570e-003	7.6000e-004
tblVehicleEF	LDT2	9.4900e-004	0.02
tblVehicleEF	LDT2	0.38	0.40
tblVehicleEF	LDT2	0.47	1.82
tblVehicleEF	LDT2	257.62	210.22
tblVehicleEF	LDT2	51.21	42.99
tblVehicleEF	LDT2	0.03	0.02
tblVehicleEF	LDT2	0.02	0.12
tblVehicleEF	LDT2	8.4100e-004	5.2900e-004
tblVehicleEF	LDT2	9.4700e-004	6.3500e-004
tblVehicleEF	LDT2	7.7400e-004	4.8800e-004
tblVehicleEF	LDT2	8.7100e-004	5.8400e-004
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	5.3850e-003	2.3170e-003
tblVehicleEF	LDT2	0.04	0.17
tblVehicleEF	LDT2	0.01	0.09
tblVehicleEF	LDT2	2.5780e-003	2.0790e-003
tblVehicleEF	LDT2	5.1900e-004	4.2500e-004
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	0.03	0.04
tblVehicleEF	LDT2	0.01	0.02
tblVehicleEF	LDT2	7.8410e-003	3.3370e-003
tblVehicleEF	LDT2	0.04	0.17
tblVehicleEF	LDT2	0.01	0.09
tblVehicleEF	LHD1	2.4170e-003	3.1500e-003
tblVehicleEF	LHD1	4.6940e-003	3.8390e-003
tblVehicleEF	LHD1	2.6090e-003	4.6680e-003
tblVehicleEF	LHD1	0.12	0.17

tblVehicleEF	LHD1	0.45	0.37
tblVehicleEF	LHD1	0.95	0.74
tblVehicleEF	LHD1	8.76	7.32
tblVehicleEF	LHD1	603.63	618.17
tblVehicleEF	LHD1	20.98	8.26
tblVehicleEF	LHD1	0.04	0.03
tblVehicleEF	LHD1	0.07	0.11
tblVehicleEF	LHD1	0.25	0.17
tblVehicleEF	LHD1	5.8800e-004	1.0160e-003
tblVehicleEF	LHD1	0.01	0.01
tblVehicleEF	LHD1	5.5980e-003	4.6190e-003
tblVehicleEF	LHD1	4.2800e-004	1.7500e-004
tblVehicleEF	LHD1	5.6200e-004	9.7200e-004
tblVehicleEF	LHD1	2.6620e-003	2.5020e-003
tblVehicleEF	LHD1	5.3290e-003	4.3780e-003
tblVehicleEF	LHD1	3.9400e-004	1.6100e-004
tblVehicleEF	LHD1	6.1100e-004	8.1200e-004
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	0.01	0.01
tblVehicleEF	LHD1	4.8100e-004	5.7000e-004
tblVehicleEF	LHD1	0.09	0.07
tblVehicleEF	LHD1	0.06	0.15
tblVehicleEF	LHD1	0.04	0.02
tblVehicleEF	LHD1	8.6000e-005	7.1000e-005
tblVehicleEF	LHD1	5.8780e-003	6.0210e-003
tblVehicleEF	LHD1	2.2500e-004	8.2000e-005
tblVehicleEF	LHD1	6.1100e-004	8.1200e-004
tblVehicleEF	LHD1	0.02	0.03
tblVehicleEF	LHD1	0.01	0.02
tblVehicleEF	LHD1	4.8100e-004	5.7000e-004

tblVehicleEF	LHD1	0.10	0.08
tblVehicleEF	LHD1	0.06	0.15
tblVehicleEF	LHD1	0.04	0.02
tblVehicleEF	LHD2	2.0490e-003	1.9500e-003
tblVehicleEF	LHD2	4.7590e-003	4.7410e-003
tblVehicleEF	LHD2	1.8250e-003	2.6000e-003
tblVehicleEF	LHD2	0.12	0.13
tblVehicleEF	LHD2	0.44	0.47
tblVehicleEF	LHD2	0.82	0.42
tblVehicleEF	LHD2	13.26	11.61
tblVehicleEF	LHD2	661.14	607.64
tblVehicleEF	LHD2	20.88	5.33
tblVehicleEF	LHD2	0.04	0.05
tblVehicleEF	LHD2	0.06	0.12
tblVehicleEF	LHD2	0.17	0.10
tblVehicleEF	LHD2	8.2400e-004	1.5230e-003
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	6.9970e-003	0.01
tblVehicleEF	LHD2	3.8600e-004	1.0100e-004
tblVehicleEF	LHD2	7.8800e-004	1.4570e-003
tblVehicleEF	LHD2	2.7120e-003	2.7230e-003
tblVehicleEF	LHD2	6.6700e-003	0.01
tblVehicleEF	LHD2	3.5500e-004	9.2000e-005
tblVehicleEF	LHD2	3.8200e-004	4.5600e-004
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	2.9300e-004	3.2000e-004
tblVehicleEF	LHD2	0.09	0.09
tblVehicleEF	LHD2	0.03	0.08
tblVehicleEF	LHD2	0.02	0.01

tblVehicleEF	LHD2	1.2900e-004	1.1100e-004
tblVehicleEF	LHD2	6.4220e-003	5.8570e-003
tblVehicleEF	LHD2	2.2200e-004	5.3000e-005
tblVehicleEF	LHD2	3.8200e-004	4.5600e-004
tblVehicleEF	LHD2	0.01	0.02
tblVehicleEF	LHD2	0.01	0.01
tblVehicleEF	LHD2	2.9300e-004	3.2000e-004
tblVehicleEF	LHD2	0.10	0.11
tblVehicleEF	LHD2	0.03	0.08
tblVehicleEF	LHD2	0.03	0.01
tblVehicleEF	MCY	0.58	0.32
tblVehicleEF	MCY	0.15	0.24
tblVehicleEF	MCY	18.41	17.47
tblVehicleEF	MCY	10.55	9.47
tblVehicleEF	MCY	196.41	213.30
tblVehicleEF	MCY	40.90	57.57
tblVehicleEF	MCY	1.18	1.15
tblVehicleEF	MCY	0.32	0.27
tblVehicleEF	MCY	2.8720e-003	2.3340e-003
tblVehicleEF	MCY	3.2940e-003	3.0160e-003
tblVehicleEF	MCY	2.6770e-003	2.1750e-003
tblVehicleEF	MCY	3.0700e-003	2.8110e-003
tblVehicleEF	MCY	0.74	0.82
tblVehicleEF	MCY	0.60	0.61
tblVehicleEF	MCY	0.45	0.46
tblVehicleEF	MCY	2.66	2.17
tblVehicleEF	MCY	0.47	1.26
tblVehicleEF	MCY	2.08	1.84
tblVehicleEF	MCY	2.3470e-003	2.1110e-003
tblVehicleEF	MCY	6.4200e-004	5.7000e-004

tblVehicleEF	MCY	0.74	0.82
tblVehicleEF	MCY	0.60	0.61
tblVehicleEF	MCY	0.45	0.46
tblVehicleEF	MCY	3.34	2.72
tblVehicleEF	MCY	0.47	1.26
tblVehicleEF	MCY	2.26	2.01
tblVehicleEF	MDV	2.3630e-003	7.4800e-004
tblVehicleEF	MDV	1.1280e-003	0.02
tblVehicleEF	MDV	0.42	0.39
tblVehicleEF	MDV	0.53	1.77
tblVehicleEF	MDV	333.42	253.73
tblVehicleEF	MDV	65.10	50.42
tblVehicleEF	MDV	0.03	0.02
tblVehicleEF	MDV	0.02	0.12
tblVehicleEF	MDV	8.7100e-004	5.0000e-004
tblVehicleEF	MDV	9.8600e-004	6.1900e-004
tblVehicleEF	MDV	8.0200e-004	4.6100e-004
tblVehicleEF	MDV	9.0700e-004	5.6900e-004
tblVehicleEF	MDV	0.03	0.04
tblVehicleEF	MDV	0.07	0.06
tblVehicleEF	MDV	0.03	0.04
tblVehicleEF	MDV	6.0450e-003	2.3020e-003
tblVehicleEF	MDV	0.05	0.17
tblVehicleEF	MDV	0.02	0.08
tblVehicleEF	MDV	3.3310e-003	2.5070e-003
tblVehicleEF	MDV	6.5900e-004	4.9900e-004
tblVehicleEF	MDV	0.03	0.04
tblVehicleEF	MDV	0.07	0.06
tblVehicleEF	MDV	0.03	0.04
tblVehicleEF	MDV	8.7490e-003	3.3090e-003

tblVehicleEF	MDV	0.05	0.17
tblVehicleEF	MDV	0.02	0.09
tblVehicleEF	MH	4.0570e-003	2.8260e-003
tblVehicleEF	MH	0.01	0.02
tblVehicleEF	MH	0.17	0.17
tblVehicleEF	MH	3.07	1.16
tblVehicleEF	MH	1,164.20	1,211.74
tblVehicleEF	MH	55.49	12.75
tblVehicleEF	MH	0.61	0.89
tblVehicleEF	MH	0.52	0.18
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	4.5150e-003	6.0970e-003
tblVehicleEF	MH	9.0600e-004	2.1500e-004
tblVehicleEF	MH	3.2190e-003	3.3060e-003
tblVehicleEF	MH	4.2780e-003	5.7970e-003
tblVehicleEF	MH	8.3300e-004	1.9800e-004
tblVehicleEF	MH	0.23	0.20
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	0.13	0.11
tblVehicleEF	MH	0.02	0.03
tblVehicleEF	MH	3.0800e-003	0.17
tblVehicleEF	MH	0.18	0.06
tblVehicleEF	MH	0.01	0.01
tblVehicleEF	MH	6.0800e-004	1.2600e-004
tblVehicleEF	MH	0.23	0.20
tblVehicleEF	MH	0.02	0.01
tblVehicleEF	MH	0.13	0.11
tblVehicleEF	MH	0.03	0.03
tblVehicleEF	MH	3.0800e-003	0.17
tblVehicleEF	MH	0.20	0.07

tblVehicleEF	MHD	0.02	3.4300e-003
tblVehicleEF	MHD	2.0360e-003	6.2800e-004
tblVehicleEF	MHD	0.03	6.7270e-003
tblVehicleEF	MHD	0.23	0.41
tblVehicleEF	MHD	0.22	0.12
tblVehicleEF	MHD	1.61	0.53
tblVehicleEF	MHD	184.96	59.04
tblVehicleEF	MHD	1,146.81	853.31
tblVehicleEF	MHD	32.83	6.43
tblVehicleEF	MHD	0.49	0.32
tblVehicleEF	MHD	0.99	1.39
tblVehicleEF	MHD	14.70	1.83
tblVehicleEF	MHD	3.8000e-005	8.0000e-005
tblVehicleEF	MHD	2.8650e-003	6.7220e-003
tblVehicleEF	MHD	4.7900e-004	1.0000e-004
tblVehicleEF	MHD	3.6000e-005	7.6000e-005
tblVehicleEF	MHD	2.7390e-003	6.4250e-003
tblVehicleEF	MHD	4.4000e-004	9.2000e-005
tblVehicleEF	MHD	3.1400e-004	2.3500e-004
tblVehicleEF	MHD	0.02	0.01
tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	2.4400e-004	1.6400e-004
tblVehicleEF	MHD	0.04	9.5590e-003
tblVehicleEF	MHD	6.6150e-003	0.06
tblVehicleEF	MHD	0.11	0.03
tblVehicleEF	MHD	1.7710e-003	5.6000e-004
tblVehicleEF	MHD	0.01	8.1290e-003
tblVehicleEF	MHD	3.5700e-004	6.4000e-005
tblVehicleEF	MHD	3.1400e-004	2.3500e-004
tblVehicleEF	MHD	0.02	0.01

tblVehicleEF	MHD	0.02	0.02
tblVehicleEF	MHD	2.4400e-004	1.6400e-004
tblVehicleEF	MHD	0.05	0.01
tblVehicleEF	MHD	6.6150e-003	0.06
tblVehicleEF	MHD	0.12	0.04
tblVehicleEF	OBUS	0.01	7.1740e-003
tblVehicleEF	OBUS	2.9690e-003	9.9400e-004
tblVehicleEF	OBUS	0.02	0.01
tblVehicleEF	OBUS	0.24	0.69
tblVehicleEF	OBUS	0.28	0.15
tblVehicleEF	OBUS	3.15	0.96
tblVehicleEF	OBUS	191.67	92.21
tblVehicleEF	OBUS	1,273.32	1,079.52
tblVehicleEF	OBUS	56.79	10.79
tblVehicleEF	OBUS	0.47	0.47
tblVehicleEF	OBUS	1.03	1.55
tblVehicleEF	OBUS	4.74	1.23
tblVehicleEF	OBUS	4.3000e-005	1.5700e-004
tblVehicleEF	OBUS	3.2390e-003	8.2570e-003
tblVehicleEF	OBUS	8.9800e-004	1.6500e-004
tblVehicleEF	OBUS	4.1000e-005	1.5000e-004
tblVehicleEF	OBUS	3.0870e-003	7.8860e-003
tblVehicleEF	OBUS	8.2600e-004	1.5200e-004
tblVehicleEF	OBUS	1.0340e-003	9.3800e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	0.04	0.05
tblVehicleEF	OBUS	5.9200e-004	4.8900e-004
tblVehicleEF	OBUS	0.05	0.01
tblVehicleEF	OBUS	0.03	0.16
tblVehicleEF	OBUS	0.21	0.06

tblVehicleEF	OBUS	1.8390e-003	8.7500e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	6.2300e-004	1.0700e-004
tblVehicleEF	OBUS	1.0340e-003	9.3800e-004
tblVehicleEF	OBUS	0.01	0.01
tblVehicleEF	OBUS	0.05	0.07
tblVehicleEF	OBUS	5.9200e-004	4.8900e-004
tblVehicleEF	OBUS	0.05	0.01
tblVehicleEF	OBUS	0.03	0.16
tblVehicleEF	OBUS	0.23	0.06
tblVehicleEF	SBUS	0.83	0.08
tblVehicleEF	SBUS	3.4400e-003	1.0470e-003
tblVehicleEF	SBUS	0.05	6.3860e-003
tblVehicleEF	SBUS	7.98	3.37
tblVehicleEF	SBUS	0.27	0.13
tblVehicleEF	SBUS	5.78	0.74
tblVehicleEF	SBUS	1,016.91	266.29
tblVehicleEF	SBUS	1,017.35	760.31
tblVehicleEF	SBUS	54.67	4.58
tblVehicleEF	SBUS	2.15	1.21
tblVehicleEF	SBUS	0.91	1.00
tblVehicleEF	SBUS	11.65	1.94
tblVehicleEF	SBUS	1.5800e-004	2.9400e-004
tblVehicleEF	SBUS	0.01	0.01
tblVehicleEF	SBUS	2.6290e-003	5.6440e-003
tblVehicleEF	SBUS	1.2280e-003	9.0000e-005
tblVehicleEF	SBUS	1.5200e-004	2.8100e-004
tblVehicleEF	SBUS	2.6410e-003	2.6620e-003
tblVehicleEF	SBUS	2.4930e-003	5.3800e-003
tblVehicleEF	SBUS	1.1290e-003	8.3000e-005

tblVehicleEF	SBUS	3.3160e-003	1.1020e-003
tblVehicleEF	SBUS	0.03	0.01
tblVehicleEF	SBUS	0.97	0.35
tblVehicleEF	SBUS	1.9100e-003	5.7700e-004
tblVehicleEF	SBUS	0.04	9.3010e-003
tblVehicleEF	SBUS	0.02	0.07
tblVehicleEF	SBUS	0.33	0.04
tblVehicleEF	SBUS	9.9840e-003	2.5440e-003
tblVehicleEF	SBUS	9.8070e-003	7.2870e-003
tblVehicleEF	SBUS	6.4700e-004	4.5000e-005
tblVehicleEF	SBUS	3.3160e-003	1.1020e-003
tblVehicleEF	SBUS	0.03	0.01
tblVehicleEF	SBUS	1.41	0.50
tblVehicleEF	SBUS	1.9100e-003	5.7700e-004
tblVehicleEF	SBUS	0.05	0.01
tblVehicleEF	SBUS	0.02	0.07
tblVehicleEF	SBUS	0.36	0.04
tblVehicleEF	UBUS	0.23	1.76
tblVehicleEF	UBUS	0.06	5.6880e-003
tblVehicleEF	UBUS	2.03	13.30
tblVehicleEF	UBUS	8.07	0.42
tblVehicleEF	UBUS	1,833.90	1,626.43
tblVehicleEF	UBUS	143.86	3.85
tblVehicleEF	UBUS	0.96	0.68
tblVehicleEF	UBUS	11.91	0.04
tblVehicleEF	UBUS	0.49	0.07
tblVehicleEF	UBUS	0.01	0.03
tblVehicleEF	UBUS	5.1640e-003	4.9490e-003
tblVehicleEF	UBUS	1.7000e-003	5.0000e-005
tblVehicleEF	UBUS	0.21	0.03

tblVehicleEF	UBUS	3.0000e-003	7.8890e-003
tblVehicleEF	UBUS	4.8970e-003	4.7310e-003
tblVehicleEF	UBUS	1.5630e-003	4.6000e-005
tblVehicleEF	UBUS	3.0320e-003	2.1200e-004
tblVehicleEF	UBUS	0.05	2.9750e-003
tblVehicleEF	UBUS	2.2660e-003	1.3000e-004
tblVehicleEF	UBUS	0.02	0.03
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	0.78	0.03
tblVehicleEF	UBUS	0.02	0.01
tblVehicleEF	UBUS	1.5880e-003	3.8000e-005
tblVehicleEF	UBUS	3.0320e-003	2.1200e-004
tblVehicleEF	UBUS	0.05	2.9750e-003
tblVehicleEF	UBUS	2.2660e-003	1.3000e-004
tblVehicleEF	UBUS	0.26	1.79
tblVehicleEF	UBUS	0.02	0.02
tblVehicleEF	UBUS	0.85	0.03
tblVehicleTrips	ST_TR	10.18	9.00
tblVehicleTrips	SU_TR	8.91	8.55
tblVehicleTrips	WD_TR	13.22	12.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					

2019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2020	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Maximum	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Area	12.7843	3.2000e-004	0.0356	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0697	0.0697	1.8000e-004	0.0000	0.0742
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	7.3644	22.6157	84.1239	0.3035	23.6927	0.1906	23.8833	6.7319	0.1799	6.9118	0.0000	28,311.4650	28,311.4650	0.9640	0.0000	28,335.5654
Waste						0.0000	0.0000		0.0000	0.0000	324.7855	0.0000	324.7855	19.1943	0.0000	804.6424
Water						0.0000	0.0000		0.0000	0.0000	155.2558	0.0000	155.2558	15.9463	0.3765	666.1171
Total	**20.1487**	**22.6160**	**84.1595**	**0.3035**	**23.6927**	**0.1907**	**23.8834**	**6.7319**	**0.1801**	**6.9120**	**480.0414**	**28,311.5347**	**28,791.5760**	**36.1047**	**0.3765**	**29,806.3990**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	12.7843	3.2000e-004	0.0356	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0697	0.0697	1.8000e-004	0.0000	0.0742
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	7.3644	22.6157	84.1239	0.3035	23.6927	0.1906	23.8833	6.7319	0.1799	6.9118	0.0000	28,311.4650	28,311.4650	0.9640	0.0000	28,335.5654
Waste						0.0000	0.0000		0.0000	0.0000	324.7855	0.0000	324.7855	19.1943	0.0000	804.6424
Water						0.0000	0.0000		0.0000	0.0000	155.2558	0.0000	155.2558	15.9463	0.3765	666.1171
Total	**20.1487**	**22.6160**	**84.1595**	**0.3035**	**23.6927**	**0.1907**	**23.8834**	**6.7319**	**0.1801**	**6.9120**	**480.0414**	**28,311.5347**	**28,791.5760**	**36.1047**	**0.3765**	**29,806.3990**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	12/4/2019	2/25/2020	5	60	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	7.3644	22.6157	84.1239	0.3035	23.6927	0.1906	23.8833	6.7319	0.1799	6.9118	0.0000	28,311.4650	28,311.4650	0.9640	0.0000	28,335.5654
Unmitigated	7.3644	22.6157	84.1239	0.3035	23.6927	0.1906	23.8833	6.7319	0.1799	6.9118	0.0000	28,311.4650	28,311.4650	0.9640	0.0000	28,335.5654

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Hospital	46,800.00	35,100.00	33345.00	108,812,645	108,812,645
Total	46,800.00	35,100.00	33,345.00	108,812,645	108,812,645

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Hospital	9.50	7.30	7.30	64.90	16.10	19.00	73	25	2

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Hospital	0.566162	0.056935	0.174451	0.112896	0.022384	0.006125	0.020280	0.030566	0.001665	0.001354	0.005350	0.001069	0.000762

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					

Hospital	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Hospital	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Hospital	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Hospital	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	12.7843	3.2000e-004	0.0356	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0697	0.0697	1.8000e-004	0.0000	0.0742
Unmitigated	12.7843	3.2000e-004	0.0356	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0697	0.0697	1.8000e-004	0.0000	0.0742

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.0336					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	10.7474					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.2600e-003	3.2000e-004	0.0356	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0697	0.0697	1.8000e-004	0.0000	0.0742
Total	**12.7843**	**3.2000e-004**	**0.0356**	**0.0000**		**1.3000e-004**	**1.3000e-004**		**1.3000e-004**	**1.3000e-004**	**0.0000**	**0.0697**	**0.0697**	**1.8000e-004**	**0.0000**	**0.0742**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.0336					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	10.7474					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.2600e-003	3.2000e-004	0.0356	0.0000		1.3000e-004	1.3000e-004		1.3000e-004	1.3000e-004	0.0000	0.0697	0.0697	1.8000e-004	0.0000	0.0742
Total	**12.7843**	**3.2000e-004**	**0.0356**	**0.0000**		**1.3000e-004**	**1.3000e-004**		**1.3000e-004**	**1.3000e-004**	**0.0000**	**0.0697**	**0.0697**	**1.8000e-004**	**0.0000**	**0.0742**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	155.2558	15.9463	0.3765	666.1171
Unmitigated	155.2558	15.9463	0.3765	666.1171

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Hospital	489.374 / 93.2141	155.2558	15.9463	0.3765	666.1171
Total		**155.2558**	**15.9463**	**0.3765**	**666.1171**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Hospital	489.374 / 93.2141	155.2558	15.9463	0.3765	666.1171
Total		**155.2558**	**15.9463**	**0.3765**	**666.1171**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	324.7855	19.1943	0.0000	804.6424
Unmitigated	324.7855	19.1943	0.0000	804.6424

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Hospital	1600	324.7855	19.1943	0.0000	804.6424
Total		**324.7855**	**19.1943**	**0.0000**	**804.6424**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Hospital	1600	324.7855	19.1943	0.0000	804.6424
Total		**324.7855**	**19.1943**	**0.0000**	**804.6424**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

UCSF – PCUP Emissions Future Phase

AIR HRA Methods and Approach
AIR Construction Idling Calculations
AIR Operational Calculations (Initial Phase – for HRA)
AIR AERMOD Model Inputs (Summary Tables)
AIR Construction HRA Calculations (Unmitigated)
AIR Construction HRA Calculations (Mitigated)
AIR Operational HRA Calculations

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

PCUP Emissions Estimates, change (increase) from existing only

Based on BAAQMD Annual Reporting

List of Assumptions/References/Notes

Increase is directly related to increase in square footage. Advancements in building energy efficiencies are not considered as to provided a conservative estimate.

Only the square footage from UC Hall/Nursing Building were considered negative. LPPI demolition was previously approved under 2014 LRDP

Aldea Housing does not use steam or energy generated by the PCUP

Existing square footage from ARUP 2019. UCSF Parnassus Heights Utility Master Plan. October 1, 2019

Assume increase in PCUP operations applied evenly to each unit i.e. the % increase in squarefootage is applied directly to each unit

PCUP (existing) Emission Factors are from 2019 BAAQMD Compliance Reporting

Emissions considered are from NG combustion only. Diesel fuel is for emergency backup only.

Turbine emissions are turbine + DB

Calculations

Square Footage

Existing, total campus	3,900,000	ft^2
Existing, connected to PCUP	2,844,131	ft^2
Final, total campus	6,000,000	ft^2
Net increase Aldea	378,000	ft^2
Future Phase Increase	2,100,000	ft^2
Future Phase Increase, no Aldea	1,722,000	
% increase	61%	ft^2

Utility Budget Projection Model 2018-10-01, Utilities Commodity Summary

Budget 2018-19	10,184,566.16	therms
	1,018,213.20	mmbtu
	998.25	mmscf
% increase	61%	
Increase	616,484.66	mmbtu

Permit Limits	Turbine 1	Turbine 2	DB 1	DB 2	Boiler 1	Boiler 2	Total
therms/yr	12,000,000		4,400,000		1,000,000	1,000,000	18,400,000

Unit	Rating (mmbtu/hr)	Controls	Capacity Fraction
Turbine 1	76	SCR + CO Cat.	33%
Duct Burner 1	46		12%
Turbine 2	62	SCR + CO Cat.	33%
Duct Burner 2	46		12%
Boiler 1	120	none	5%
Boiler 2	120	none	5%

Existing 2018-19 Reporting

Pollutant	Sources							UOM
	Turbine 1	Turbine 2	DB 1	DB 2	Boiler 1	Boiler 2	Total PCUP	
Benzene	2.27E-02	2.65E-02	2.70E-04	7.78E-04	5.63E-05	8.11E-05	5.04E-02	lb/day
Formaldehyde	3.30E+00	3.85E+00	3.18E-03	9.15E-03	2.79E-03	4.02E-03	7.17E+00	lb/day
Organics (other, including	1.58E+00	1.84E+00	4.32E-01	1.24E+00	9.21E-02	1.33E-01	5.32E+00	lb/day
Particulates (part not spe	6.47E+00	7.54E+00	2.85E-01	8.21E-01	2.29E-01	3.29E-01	1.57E+01	lb/day
Nitrous Oxide (N2O)	3.11E-02	3.62E-02	1.37E-03	3.94E-03	6.95E-03	1.00E-02	8.96E-02	lb/day
Nitrogen Oxides (part not	2.53E+00	2.95E+00	1.11E-01	3.21E-01	9.31E-01	1.34E+00	8.18E+00	lb/day
Sulfur Dioxide (SO2)	5.46E-01	6.37E-01	2.41E-02	6.93E-02	1.71E-02	2.46E-02	1.32E+00	lb/day
Carbon Monoxide (CO) pollu	5.05E+00	5.89E+00	9.68E-01	2.79E+00	1.13E+00	1.63E+00	1.75E+01	lb/day
Carbon Dioxide, non-biogen	1.18E+05	1.37E+05	5.19E+03	1.49E+04	3.69E+03	5.31E+03	2.84E+05	lb/day
Methane (CH4)	4.34E+00	5.06E+00	8.04E-02	2.32E-01	5.72E-02	8.24E-02	9.85E+00	lb/day
Toluene	0.00E+00	0.00E+00	1.44E-04	4.15E-04	0.00E+00	0.00E+00	5.59E-04	lb/day
PM10	6.43E+00	7.49E+00	0.00E+00	0.00E+00	2.29E-01	3.29E-01	1.45E+01	lb/day

PM2.5	6.02E+00	7.01E+00	0.00E+00	0.00E+00	2.29E-01	3.29E-01	1.36E+01	lb/day	8.29E+00	

Estimated Increase

Pollutant	Sources					UOM	Sources					UOM
	Turbine 1	Turbine 2	Boiler 1	Boiler 2	Total PCUP		Turbine 1	Turbine 2	Boiler 1	Boiler 2	Total PCUP	
Benzene	1.39E-02	1.65E-02	3.41E-05	4.91E-05	3.05E-02	lb/day	2.54E-03	3.01E-03	6.22E-06	8.96E-06	5.57E-03	ton/yr
Formaldehyde	2.00E+00	2.34E+00	1.69E-03	2.43E-03	4.34E+00	lb/day	3.65E-01	4.26E-01	3.08E-04	4.44E-04	7.92E-01	ton/yr
Organics (other, including	1.22E+00	1.86E+00	5.58E-02	8.05E-02	3.22E+00	lb/day	2.22E-01	3.40E-01	1.02E-02	1.47E-02	5.88E-01	ton/yr
Particulates (part not spe	4.09E+00	5.06E+00	1.39E-01	1.99E-01	9.49E+00	lb/day	7.46E-01	9.24E-01	2.53E-02	3.64E-02	1.73E+00	ton/yr
Nitrous Oxide (N2O)	1.97E-02	2.43E-02	4.21E-03	6.05E-03	5.42E-02	lb/day	3.59E-03	4.44E-03	7.68E-04	1.10E-03	9.90E-03	ton/yr
Nitrogen Oxides (part not	1.60E+00	1.98E+00	5.64E-01	8.11E-01	4.95E+00	lb/day	2.92E-01	3.61E-01	1.03E-01	1.48E-01	9.04E-01	ton/yr
Sulfur Dioxide (SO2)	3.45E-01	4.28E-01	1.04E-02	1.49E-02	7.98E-01	lb/day	6.30E-02	7.80E-02	1.89E-03	2.72E-03	1.46E-01	ton/yr
Carbon Monoxide (CO) pollu	3.64E+00	5.26E+00	6.84E-01	9.87E-01	1.06E+01	lb/day	6.65E-01	9.59E-01	1.25E-01	1.80E-01	1.93E+00	ton/yr
Carbon Dioxide, non-biogen	7.46E+04	9.20E+04	2.23E+03	3.21E+03	1.72E+05	lb/day	1.36E+04	1.68E+04	4.08E+02	5.87E+02	3.14E+04	ton/yr
Methane (CH4)	2.68E+00	3.20E+00	3.46E-02	4.99E-02	5.96E+00	lb/day	4.88E-01	5.85E-01	6.32E-03	9.10E-03	1.09E+00	ton/yr
Toluene	8.72E-05	2.51E-04	0.00E+00	0.00E+00	3.38E-04	lb/day	1.59E-05	4.59E-05	0.00E+00	0.00E+00	6.18E-05	ton/yr
PM10	3.89E+00	4.54E+00	1.39E-01	1.99E-01	8.77E+00	lb/day	7.11E-01	8.28E-01	2.53E-02	3.64E-02	1.60E+00	ton/yr
PM2.5	3.64E+00	4.25E+00	1.39E-01	1.99E-01	8.23E+00	lb/day	6.65E-01	7.75E-01	2.53E-02	3.64E-02	1.50E+00	ton/yr

Criteria Summary

Pollutant	Turbine 1	Turbine 2	Boiler 1	Boiler 2	Total PCUP	UOM	Turbine 1	Turbine 2	Boiler 1	Boiler 2	Total PCUP	UOM	Total 2050
ROG	1.22	1.86	0.06	0.08	3.22	lb/day	0.22	0.34	0.01	0.01	0.59	ton/yr	Total 2050
NOX	1.60	1.98	0.56	0.81	4.95	lb/day	0.29	0.36	0.10	0.15	0.90	ton/yr	1.31E+01
PM10	3.89	4.54	0.14	0.20	8.77	lb/day	0.71	0.83	0.03	0.04	1.60	ton/yr	2.33E+01
PM2.5	3.64	4.25	0.14	0.20	8.23	lb/day	0.66	0.77	0.03	0.04	1.50	ton/yr	2.18E+01

AIR HRA Methods and Approach

APPROACH AND METHODOLOGY TO HEALTH RISK ASSESSMENT

A Health Risk Assessment (HRA) was prepared to analyze the estimate cancer risks, chronic health hazards, and acute health hazards from TAC exposure as well as exposure to fine particulates presented as the annual average $PM_{2.5}$ concentration. A three-step process was used to calculated the health risk associated to construction activities and also the health risk from new operations of the initial phase building out. The first steps involve calculating TAC emissions from all new sources. Emissions from construction were calculated using CARB's CalEEMod software program to estimate average annual diesel exhaust emissions (as reported as exhaust of PM_{10}) during project construction. Idling emissions associated with heavy-duty trucks (haul trucks, concrete trucks, material delivery trucks, etc.) were estimated based on the anticipated number of truck trips and idling emission factors for heavy-duty vehicles from EMFAC2017 for on-road emissions. These emissions were modeled outside of CalEEMod because the model does not accurately account for the anticipated idling activity at the project site, which is needed for the HRA.

Operational emissions associated to the initial phase build out that are anticipated to increase or relocate TAC sources include: fume hoods at the RAB, a new emergency diesel generator at the RAB, and increased power generation from the CUP to accommodate additional building square footage. The emergency diesel generator emissions were calculated using CalEEMod to estimate the annual average DPM (as reported as exhaust PM_{10}) based on an anticipated permit limit of 50 hours per year for engine reliability.[i] Fume hood TAC emissions were calculated using methodologies documented in a memorandum to UCSF dated December 3, 2018 that was commissioned for the approach to analysis in the UCSF Mission Bay HRA[ii],[iii]. CUP calculations were based on UCSF's BAAQMD emissions report from their most recent reporting cycle and supplemented with emission calculation methodologies utilized for UCSF Mission Bay HRA , [iv] . Detailed calculations, including all assumptions and discussion of approach to analysis, can be found in this appendix.

The second step involved using the AERMOD (version 18081) dispersion model to convert emissions to maximum annual TAC concentrations for the cancer risk, chronic risk and $PM_{2.5}$ exposure, and also maximum 1-hour TAC concentrations for the acute risk analysis. Modeled sensitive receptor locations include residential areas, daycares, and schools (for children under 16 years of age). A 20-meter receptor grid co-located with the CRRP-HRA grid was modeled using a receptor height of 1.8 meters (breathing height).

Emission rates from the various emission sources (e.g., construction activities, haul truck routes, CUP etc.) were based on the anticipated hours of activity for each source and other information. The following sources were included in each respective model.

Construction model:

- Four Area Source for the main construction activates for each the ISA, RAB, New Hospital, and initial phase of Aldea housing expansion.
- Four Area Source for the idling emissions associated with haul truck import/export for each the ISA, RAB, New Hospital, and initial phase of Aldea housing expansion.
- A Line Area source for the haul route along Parnassus Aveunue
- Two Line Area sources to represent the haul route for the Aldea housing construction

Operational model:

- Forty Point Sources on top of the RAB building to model fume hoods
- One Point Source for the emergency generator for the RAB
- Four Point Sources for each the Combustion Turbine/After Burner 1 and 2, and Boilers 1 and 2 at the central utility plant

The source parameters included in the modeling input are detailed in tables AIR-1, AIR-2, and AIR-3. Because each emission source was modeled separately within AERMOD, a unitized emission rate concept for each source, where each source is modeled with a unitized emission rate of 1 gram/second (g/s). The modeled concentration at each receptor (micrograms per cubic meter [μ/m^3]/[g/s]) represents a "dispersion factor," which was then multiplied by the actual emission rate of each source to determine actual concentrations.

In accordance with OEHHA *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* the last step was accomplished by applying the highest estimated concentrations of TAC at the receptors analyzed to the established cancer potency factors and acceptable reference concentrations for non-cancer health effects[v]. Increased cancer risks were calculated using the modeled TAC concentrations and OEHHA-recommended methodologies for both a child exposure (starting at 3rd trimester) as well as daycare and school exposure. The cancer risk calculations were based on applying the OEHHA-recommended age sensitivity factors and breathing rates, as well as fraction of time at home and an exposure duration of 30 years. Age-sensitivity factors reflect the greater sensitivity of infants and small children to cancer causing air pollutants. Because health risk is a localized impact, two exposure scenarios were considered because the MEI for the construction HRA varied from the MEI for the operational HRA. The first scenario evaluated the construction impacts plus operational impacts for 30 total years of exposure and the second scenario evaluated the operational impacts only for 30 years of exposure. The full HRA calculations are presented in this appendix.

These conservative methodologies overestimate both non-carcinogenic and carcinogenic health risk, possibly by an order of magnitude or more. Therefore, for carcinogenic risks, the actual probabilities of cancer formation in the populations of concern due to exposure to carcinogenic pollutants are likely to be lower than the risks derived using the HRA methodology. The extrapolation of toxicity data in animals to humans, the estimation of concentration prediction methods within dispersion models; and the variability in lifestyles, fitness and other confounding factors of the human population also contribute to the overestimation of health impacts. Therefore, the results of the HRA are highly overstated.

[i] BAAQMD, 2018a. Bay Area Air Quality Management District Engineering Division Permit Handbook. October 2018. Available: http://www.baaqmd.gov/~/media/files/engineering/permit-handbook/baaqmd-permit-handbook.pdf

[ii] Atmospheric Dynamics, Inc., 2018. Memorandum Subject: Draft Fume Hood Emissions Quantification Methodology (Revised). December 3, 2018.

[iii] Atmospheric Dynamics, Inc., 2019. Health Risk Assessment Final Report Submittal UCSF Mission Bay Campus. May 2019.

[iv] BAAQMD, 2019a. Bay Area Air Quality Management District Detail Pollutants – Abated, Most Recent P/O Approved (2019), UCSF/Parnassus (P# 2478). Received via Stationary Source Inquiry Form, Available: http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools

[v] OEHHA, 2019. Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values. September 2019. Available: https://ww3.arb.ca.gov/toxics/healthval/contable.pdf

AIR Construction Idling Calculations

UCSF Parnassus Heights LRDP

Construction On-Site Idling Emissions

assume 15 minutes of onsite idling per haul or delivery trip

From EMFAC2017 (San Francisco Bay Area, Diesel fueled HHDT)

Idling Emission Factors -g/h g/hr

	ROG	NOX	PM10	PM2.5
2021	2.4	35.9	0.0	0.0
2022	2.4	34.3	0.0	0.0
2023	2.3	31.4	0.0	0.0
2024	2.3	31.1	0.0	0.0
2025	2.4	30.8	0.0	0.0
2026	2.4	30.5	0.0	0.0
2027	2.4	30.3	0.0	0.0
2028	2.4	30.1	0.0	0.0
2029	2.4	29.9	0.0	0.0
2030	2.4	29.7	0.0	0.0

per haul trip	15

Project Area	Phase Name	Start Date	End Date	Workdays	total trips
ISA	Demo	3/1/2022	5/31/2022	66	136
ISA	Excavation	3/1/2022	5/31/2022	66	125
RAB	Demo	3/1/2022	5/31/2022	66	1060
RAB	Site Prep	3/1/2022	5/31/2022	66	4954
RAB	Grading	3/1/2022	12/31/2022	219	3420
HDMC	Grading	6/1/2024	12/31/2024	152	16847
IAH	Demo	1/3/2028	1/28/2028	20	108
IAH	Site Prep	1/29/2028	2/2/2028	3	247
IAH	Grading	2/3/2028	2/10/2028	6	312

Trips and phasing from CalEEMod modeling

					Haul Truck Emissions (g)				Haul Truck Emissions (tons)			
Project Area	Phase Name	Year	Num Days	Haul Trips	ROG	NOX	PM10	PM2.5	ROG	NOX	PM10	PM2.5
ISA	Demo	2021	0	0	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ISA	Demo	2022	66	136	80.24	1165.23	0.84	0.80	8.84E-05	1.28E-03	9.23E-07	8.83E-07
ISA	Excavation	2022	66	125	73.75	1070.98	0.77	0.74	8.13E-05	1.18E-03	8.48E-07	8.11E-07
RAB	Demo	2021	0	0	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RAB	Demo	2022	66	1060	625.39	9081.94	6.52	6.24	6.89E-04	1.00E-02	7.19E-06	6.88E-06
RAB	Site Prep	2021	0	0	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RAB	Site Prep	2022	66	4954	2922.83	42445.21	30.48	29.17	3.22E-03	4.68E-02	3.36E-05	3.22E-05
RAB	Grading	2021	0	0	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RAB	Grading	2022	219	3420	2017.78	29302.10	21.05	20.13	2.22E-03	3.23E-02	2.32E-05	2.22E-05
HDMC	Grading	2024	152	16847	9894.76	130843.12	80.67	77.18	1.09E-02	1.44E-01	8.89E-05	8.51E-05
IAH	Demo	2028	20	108	63.55	812.88	0.43	0.41	7.00E-05	8.96E-04	4.69E-07	4.48E-07
IAH	Site Prep	2028	3	247	145.33	1859.08	0.97	0.93	1.60E-04	2.05E-03	1.07E-06	1.03E-06
IAH	Grading	2028	6	312	183.58	2348.31	1.23	1.18	2.02E-04	2.59E-03	1.35E-06	1.30E-06
									1.76E-02	**2.41E-01**	**1.58E-04**	**1.51E-04**

Idling Onsite - Tons Per Year

Project Area	Year	ROG	NOX	Exhaust PM10	Exhaust PM2.5
ISA	2021	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ISA	2022	1.70E-04	2.47E-03	1.77E-06	1.69E-06
ISA	2023	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RAB	2021	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RAB	2022	6.14E-03	8.91E-02	6.40E-05	6.12E-05
RAB	2023	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RAB	2024	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RAB	2025	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HDMC	2023	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HDMC	2024	1.09E-02	1.44E-01	8.89E-05	8.51E-05
HDMC	2025	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HDMC	2026	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HDMC	2027	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HDMC	2028	0.00E+00	0.00E+00	0.00E+00	0.00E+00
HDMC	2029	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IAH	2028	4.33E-04	5.53E-03	2.89E-06	2.77E-06
IAH	2029	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Total tons by year	ROG	NOX	ExhaustPM10	ExhaustPM2.5
2021	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2022	6.31E-03	9.16E-02	6.58E-05	6.29E-05
2023	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2024	1.09E-02	1.44E-01	8.89E-05	8.51E-05
2025	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2026	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2027	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2028	4.33E-04	5.53E-03	2.89E-06	2.77E-06
2029	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Lbs/day by year			ROG	NOX	ExhaustPM10	ExhaustPM2.5
2021	6/1/2021	12/31/2021	154.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2022	1/1/2022	12/31/2022	260.00	4.85E-02	7.04E-01	5.06E-04	4.84E-04
2023	1/1/2023	12/31/2023	260.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2024	1/1/2024	12/31/2024	262.00	8.33E-02	1.10E+00	6.79E-04	6.49E-04
2025	1/1/2025	12/31/2025	261.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2026	1/1/2026	12/31/2026	261.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2027	1/1/2027	12/31/2027	261.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2028	1/1/2028	12/31/2028	260.00	3.33E-03	4.26E-02	2.23E-05	2.13E-05
2029	1/1/2029	1/11/2029	9.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

AIR Operational Calculations (Initial Phase – for HRA)

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

PCUP Emissions Estimates, change (increase) from existing only

Based on BAAQMD Annual Reporting

List of Assumptions/References/Notes

Increase is directly related to increase in square footage. Advancements in building energy efficiencies are not considered as to provided a conservative estimate.

Only the square footage from UC Hall/Nursing Building were considered negative. LPPI demolition was previously approved under 2014 LRDP

Aldea Housing does not use steam or energy generated by the PCUP

Existing square footage from ARUP 2019. UCSF Parnassus Heights Utility Master Plan. October 1, 2019

Assume increase in PCUP operations applied evenly to each unit i.e. the % increase in squarefootage is applied directly to each unit

PCUP (existing) Emission Factors are from 2019 BAAQMD Compliance Reporting

Emissions considered are from NG combustion only. Diesel fuel is for emergency backup only.

Turbine emissions are turbine + DB

Calculations

Square Footage

Existing	2,844,131	ft^2
Demo'd	236,335	ft^2
New	295,000	ft^2
ISA	25,000	
RAB	270,000	
% increase	2%	ft^2

Permit Limits	Turbine 1	Turbine 2	DB 1	DB 2	Boiler 1	Boiler 2
therms/yr	12,000,000		4,400,000		1,000,000	1,000,000

Existing 2018-19 Reporting

Pollutant	Sources							UOM
	Turbine 1	Turbine 2	DB 1	DB 2	Boiler 1	Boiler 2	Total PCUP	
Benzene	2.27E-02	2.65E-02	2.70E-04	7.78E-04	5.63E-05	8.11E-05	5.04E-02	lb/day
Formaldehyde	3.30E+00	3.85E+00	3.18E-03	9.15E-03	2.79E-03	4.02E-03	7.17E+00	lb/day
Organics (other, including	1.58E+00	1.84E+00	4.32E-01	1.24E+00	9.21E-02	1.33E-01	5.32E+00	lb/day
Particulates (part not spe	6.47E+00	7.54E+00	2.85E-01	8.21E-01	2.29E-01	3.29E-01	1.57E+01	lb/day
Nitrous Oxide (N2O)	3.11E-02	3.62E-02	1.37E-03	3.94E-03	6.95E-03	1.00E-02	8.96E-02	lb/day
Nitrogen Oxides (part not	2.53E+00	2.95E+00	1.11E-01	3.21E-01	9.31E-01	1.34E+00	8.18E+00	lb/day
Sulfur Dioxide (SO2)	5.46E-01	6.37E-01	2.41E-02	6.93E-02	1.71E-02	2.46E-02	1.32E+00	lb/day
Carbon Monoxide (CO) pollu	5.05E+00	5.89E+00	9.68E-01	2.79E+00	1.13E+00	1.63E+00	1.75E+01	lb/day
Carbon Dioxide, non-biogen	1.18E+05	1.37E+05	5.19E+03	1.49E+04	3.69E+03	5.31E+03	2.84E+05	lb/day
Methane (CH4)	4.34E+00	5.06E+00	8.04E-02	2.32E-01	5.72E-02	8.24E-02	9.85E+00	lb/day
Toluene	0.00E+00	0.00E+00	1.44E-04	4.15E-04	0.00E+00	0.00E+00	5.59E-04	lb/day
PM10	6.43E+00	7.49E+00	0.00E+00	0.00E+00	2.29E-01	3.29E-01	1.45E+01	lb/day
PM2.5	6.02E+00	7.01E+00	0.00E+00	0.00E+00	2.29E-01	3.29E-01	1.36E+01	lb/day

Estimated Increase

Pollutant	Sources					UOM	Sources					UOM
	Turbine 1	Turbine 2	Boiler 1	Boiler 2	Total PCUP		Turbine 1	Turbine 2	Boiler 1	Boiler 2	Total PCUP	
Benzene	4.74E-04	5.63E-04	1.16E-06	1.67E-06	1.04E-03	lb/day	8.65E-05	1.03E-04	2.12E-07	3.05E-07	1.90E-04	ton/yr
Formaldehyde	6.81E-02	7.96E-02	5.75E-05	8.29E-05	1.48E-01	lb/day	1.24E-02	1.45E-02	1.05E-05	1.51E-05	2.70E-02	ton/yr
Organics (other, including	4.15E-02	6.35E-02	1.90E-03	2.74E-03	1.10E-01	lb/day	7.57E-03	1.16E-02	3.47E-04	5.01E-04	2.00E-02	ton/yr
Particulates (part not spe	1.39E-01	1.72E-01	4.72E-03	6.79E-03	3.23E-01	lb/day	2.54E-02	3.15E-02	8.62E-04	1.24E-03	5.90E-02	ton/yr
Nitrous Oxide (N2O)	6.70E-04	8.28E-04	1.43E-04	2.06E-04	1.85E-03	lb/day	1.22E-04	1.51E-04	2.62E-05	3.76E-05	3.37E-04	ton/yr
Nitrogen Oxides (part not	5.45E-02	6.75E-02	1.92E-02	2.76E-02	1.69E-01	lb/day	9.94E-03	1.23E-02	3.50E-03	5.04E-03	3.08E-02	ton/yr
Sulfur Dioxide (SO2)	1.18E-02	1.46E-02	3.53E-04	5.07E-04	2.72E-02	lb/day	2.15E-03	2.66E-03	6.44E-05	9.26E-05	4.96E-03	ton/yr
Carbon Monoxide (CO) pollu	1.24E-01	1.79E-01	2.33E-02	3.36E-02	3.60E-01	lb/day	2.27E-02	3.27E-02	4.25E-03	6.14E-03	6.57E-02	ton/yr
Carbon Dioxide, non-biogen	2.54E+03	3.13E+03	7.61E+01	1.10E+02	5.86E+03	lb/day	4.64E+02	5.72E+02	1.39E+01	2.00E+01	1.07E+03	ton/yr
Methane (CH4)	9.12E-02	1.09E-01	1.18E-03	1.70E-03	2.03E-01	lb/day	1.66E-02	1.99E-02	2.15E-04	3.10E-04	3.71E-02	ton/yr
Toluene	2.97E-06	8.56E-06	0.00E+00	0.00E+00	1.15E-05	lb/day	5.42E-07	1.56E-06	0.00E+00	0.00E+00	2.10E-06	ton/yr
PM10	1.33E-01	1.55E-01	4.72E-03	6.79E-03	2.99E-01	lb/day	2.42E-02	2.82E-02	8.62E-04	1.24E-03	5.45E-02	ton/yr
PM2.5	1.24E-01	1.45E-01	4.72E-03	6.79E-03	2.80E-01	lb/day	2.27E-02	2.64E-02	8.62E-04	1.24E-03	5.11E-02	ton/yr

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

PCUP Emissions Estimates, change (increase) from existing only

Based on methods certified in Mission Bay EIR (SCAQMD AB2588 Reporting Procedures for AB2588 Facilities, 12/2016.)

List of Assumptions/References/Notes

Increase is directly related to increase in square footage. Advancements in building energy efficiencies are not considered as to provided a conservative estimate.

Only the square footage from UC Hall/Nursing Building were considered negative. LPPI demolition was previously approved under 2014 LRDP

Aldea Housing does not use steam or energy generated by the PCUP

Existing square footage from ARUP 2019. UCSF Parnassus Heights Utility Master Plan. October 1, 2019

Assume increase in PCUP operations applied evenly to each unit i.e. the % increase in squarefootage is applied directly to each unit

PCUP (existing) Emission Factors are from 2019 BAAQMD Compliance Reporting

Emissions considered are from NG combustion only. Diesel fuel is for emergency backup only.

Turbine emissions are turbine + DB

Calculations

Square Footage

Existing	2,844,131	ft^2
Demoed	236,335	ft^2
New	295,000	ft^2
% increase	2%	ft^2

Utility Budget Projection Model 2018-10-01, Utilities Commodity Summary

Budget 2018-19	10,184,566.16	therms
	1,018,213.20	mmbtu
	998.25	mmscf

CO Catalyst HAP Control %	80%	see Mission Bay EIR + EPA 2015 reference

Permit Limits	Turbine 1	Turbine 2	DB 1	DB 2	Boiler 1	Boiler 2	Total
therms/yr	12,000,000		4,400,000		1,000,000	1,000,000	18,400,000

Unit	Rating (mmbtu/hr)	Controls	Capacity Fraction
Turbine 1	76	SCR + CO Cat.	45%
Duct Burner 1	46		
Turbine 2	62	SCR + CO Cat.	45%
Duct Burner 2	46		
Boiler 1	120	none	5%
Boiler 2	120	none	5%

Emission Factors from Table B-1

Pollutant	Sources				UOM
	Turbine 1	Turbine 2	Boiler 1	Boiler 2	
1,3-Butadiene	4.39E-04	4.39E-04	0.00E+00	0.00E+00	lb/mmscf
Total PAH (excluding Napthalene)	9.18E-04	9.18E-04	1.00E-04	1.00E-04	lb/mmscf
Naphthalene	1.33E-03	1.33E-03	3.00E-04	3.00E-04	lb/mmscf
Acetaldehyde	4.08E-02	4.08E-02	9.00E-04	9.00E-04	lb/mmscf
Acrolein	6.53E-03	6.53E-03	8.00E-04	8.00E-04	lb/mmscf
Ammonia	9.10E+00	9.10E+00	3.20E+00	3.20E+00	lb/mmscf
Ethyl benzene	3.26E-02	3.26E-02	2.00E-03	2.00E-03	lb/mmscf
Propylene oxide	2.96E-02	2.96E-02	0.00E+00	0.00E+00	lb/mmscf
Hexane	0.00E+00	0.00E+00	1.30E-03	1.30E-03	lb/mmscf
Xylene	6.53E-02	6.53E-02	5.80E-03	5.80E-03	lb/mmscf

Controlled Emission Factors

Pollutant	Sources				UOM
	Turbine 1	Turbine 2	Boiler 1	Boiler 2	
1,3-Butadiene	8.78E-05	8.78E-05	0.00E+00	0.00E+00	lb/mmscf
Total PAH (excluding	1.84E-04	1.84E-04	1.00E-04	1.00E-04	lb/mmscf
Naphthalene	2.66E-04	2.66E-04	3.00E-04	3.00E-04	lb/mmscf
Acetaldehyde	8.16E-03	8.16E-03	9.00E-04	9.00E-04	lb/mmscf
Acrolein	1.31E-03	1.31E-03	8.00E-04	8.00E-04	lb/mmscf
Ammonia	9.10E+00	9.10E+00	3.20E+00	3.20E+00	lb/mmscf
Ethyl benzene	6.52E-03	6.52E-03	2.00E-03	2.00E-03	lb/mmscf
Propylene oxide	5.92E-03	5.92E-03	0.00E+00	0.00E+00	lb/mmscf
Hexane	0.00E+00	0.00E+00	1.30E-03	1.30E-03	lb/mmscf
Xylene	1.31E-02	1.31E-02	5.80E-03	5.80E-03	lb/mmscf

CO catalysts on gas turbines result in approximately 90 percent reduction of CO and 85 to 90 percent control of formaldehyde (similar reductions can be expected on other HAPs).
US EPA 2015. Catalog of CHP Technologies Section 3. Technology Characterization - Combustion Turbines. March 2015
https://www.epa.gov/sites/production/files/2015-07/documents/catalog_of_chp_technologies_section_3._technology_characterization_-_combustion_turbines.pdf

Estimated Increase

Pollutant	Sources					UOM	Sources					UOM
	Turbine 1	Turbine 2	Boiler 1	Boiler 2	Total PCUP		Turbine 1	Turbine 2	Boiler 1	Boiler 2	Total PCUP	
1,3-Butadiene	2.21E-06	2.21E-06	0.00E+00	0.00E+00	4.41E-06	lb/day	4.03E-07	4.03E-07	0.00E+00	0.00E+00	8.06E-07	ton/yr
Total PAH (excluding Napthalene)	4.62E-06	4.62E-06	3.07E-07	3.07E-07	9.84E-06	lb/day	8.42E-07	8.42E-07	5.60E-08	5.60E-08	1.80E-06	ton/yr
Naphthalene	6.69E-06	6.69E-06	9.20E-07	9.20E-07	1.52E-05	lb/day	1.22E-06	1.22E-06	1.68E-07	1.68E-07	2.78E-06	ton/yr
Acetaldehyde	2.05E-04	2.05E-04	2.76E-06	2.76E-06	4.16E-04	lb/day	3.74E-05	3.74E-05	5.04E-07	5.04E-07	7.59E-05	ton/yr
Acrolein	3.28E-05	3.28E-05	2.45E-06	2.45E-06	7.06E-05	lb/day	5.99E-06	5.99E-06	4.48E-07	4.48E-07	1.29E-05	ton/yr
Ammonia	2.29E-01	2.29E-01	9.81E-03	9.81E-03	4.77E-01	lb/day	4.18E-02	4.18E-02	1.79E-03	1.79E-03	8.71E-02	ton/yr
Ethyl benzene	1.64E-04	1.64E-04	6.13E-06	6.13E-06	3.40E-04	lb/day	2.99E-05	2.99E-05	1.12E-06	1.12E-06	6.21E-05	ton/yr
Propylene oxide	1.49E-04	1.49E-04	0.00E+00	0.00E+00	2.98E-04	lb/day	2.72E-05	2.72E-05	0.00E+00	0.00E+00	5.43E-05	ton/yr
Hexane	0.00E+00	0.00E+00	3.99E-06	3.99E-06	7.97E-06	lb/day	0.00E+00	0.00E+00	7.27E-07	7.27E-07	1.45E-06	ton/yr
Xylene	3.28E-04	3.28E-04	1.78E-05	1.78E-05	6.92E-04	lb/day	5.99E-05	5.99E-05	3.25E-06	3.25E-06	1.26E-04	ton/yr

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

PCUP Emissions Estimates, change (increase) from existing only

Summary of Emissions to be used for criteria reporting and HRA calculations

List of Assumptions/References/Notes

See PCUP Calcuations Part 1 and Part 2 for specific assumptions

Emissions from BAAQMD 2018-19 Reporting were used as default, SCAQMD AB2588 emission calculation methods were used to suppliment

From BAAQMD 2018-19 Reporting: Benzene
Formaldehyde
Toluene
PM10
PM2.5
Particulates (part not spec elsewhere)
Organics (other, including CH4)
Nitrous Oxide (N2O)
Nitrogen Oxides (part not spec elsewhere) (2990)
Sulfur Dioxide (SO2)
Carbon Monoxide (CO) pollutant
Carbon Dioxide, non-biogenic CO2
Methane (CH4)

Calculations

Estimated Increase

Pollutant	Sources					UOM	Sources					UOM	CPF[2]	Chronic REL[2]
	Turbine 1	Turbine 2	Boiler 1	Boiler 2	Total PCUP		Turbine 1	Turbine 2	Boiler 1	Boiler 2	Total PCUP		(mg/kg-day)$^{-1}$	(ug/m^3)
Acetaldehyde	2.05E-04	2.05E-04	2.76E-06	2.76E-06	4.16E-04	lb/day	3.74E-05	3.74E-05	5.04E-07	5.04E-07	7.59E-05	ton/yr	1.00E-02	1.40E+02
Acrolein	3.28E-05	3.28E-05	2.45E-06	2.45E-06	7.06E-05	lb/day	5.99E-06	5.99E-06	4.48E-07	4.48E-07	1.29E-05	ton/yr	--	3.50E-01
Ammonia	2.29E-01	2.29E-01	9.81E-03	9.81E-03	4.77E-01	lb/day	4.18E-02	4.18E-02	1.79E-03	1.79E-03	8.71E-02	ton/yr	--	2.00E+02
Benzene	4.74E-04	5.63E-04	1.16E-06	1.67E-06	1.04E-03	lb/day	8.65E-05	1.03E-04	2.12E-07	3.05E-07	1.90E-04	ton/yr	1.00E-01	3.00E+00
1,3-Butadiene	2.21E-06	2.21E-06	0.00E+00	0.00E+00	4.41E-06	lb/day	4.03E-07	4.03E-07	0.00E+00	0.00E+00	8.06E-07	ton/yr	6.00E-01	2.00E+00
Ethyl benzene	1.64E-04	1.64E-04	6.13E-06	6.13E-06	3.40E-04	lb/day	2.99E-05	2.99E-05	1.12E-06	1.12E-06	6.21E-05	ton/yr	8.70E-03	2.00E+03
Formaldehyde	6.81E-02	7.96E-02	5.75E-05	8.29E-05	1.48E-01	lb/day	1.24E-02	1.45E-02	1.05E-05	1.51E-05	2.70E-02	ton/yr	2.10E-02	9.00E+00
Hexane	0.00E+00	0.00E+00	3.99E-06	3.99E-06	7.97E-06	lb/day	0.00E+00	0.00E+00	7.27E-07	7.27E-07	1.45E-06	ton/yr	--	7.00E+03
Naphthalene	6.69E-06	6.69E-06	9.20E-07	9.20E-07	1.52E-05	lb/day	1.22E-06	1.22E-06	1.68E-07	1.68E-07	2.78E-06	ton/yr	1.20E-01	9.00E+00
Propylene oxide	1.49E-04	1.49E-04	0.00E+00	0.00E+00	2.98E-04	lb/day	2.72E-05	2.72E-05	0.00E+00	0.00E+00	5.43E-05	ton/yr	1.30E-02	3.00E+01
Toluene	2.97E-06	8.56E-06	0.00E+00	0.00E+00	1.15E-05	lb/day	5.42E-07	1.56E-06	0.00E+00	0.00E+00	2.10E-06	ton/yr	--	3.00E+02
Total PAH (excluding Napthalene)[2]	4.62E-06	4.62E-06	3.07E-07	3.07E-07	9.84E-06	lb/day	8.42E-07	8.42E-07	5.60E-08	5.60E-08	1.80E-06	ton/yr	3.90E+00	--
Xylene	3.28E-04	3.28E-04	1.78E-05	1.78E-05	6.92E-04	lb/day	5.99E-05	5.99E-05	3.25E-06	3.25E-06	1.26E-04	ton/yr	--	7.00E+02
PM10	1.33E-01	1.55E-01	4.72E-03	6.79E-03	2.99E-01	lb/day	2.42E-02	2.82E-02	8.62E-04	1.24E-03	5.45E-02	ton/yr	--	--
PM2.5	1.24E-01	1.45E-01	4.72E-03	6.79E-03	2.80E-01	lb/day	2.27E-02	2.64E-02	8.62E-04	1.24E-03	5.11E-02	ton/yr	--	--
Particulates (part notspec elsewhere)	1.39E-01	1.72E-01	4.72E-03	6.79E-03	3.23E-01	lb/day	2.54E-02	3.15E-02	8.62E-04	1.24E-03	5.90E-02	ton/yr	--	--
Organics (other, including CH4)	4.15E-02	6.35E-02	1.90E-03	2.74E-03	1.10E-01	lb/day	7.57E-03	1.16E-02	3.47E-04	5.01E-04	2.00E-02	ton/yr	--	--
Nitrous Oxide (N2O)	6.70E-04	8.28E-04	1.43E-04	2.06E-04	1.85E-03	lb/day	1.22E-04	1.51E-04	2.62E-05	3.76E-05	3.37E-04	ton/yr	--	--
Nitrogen Oxides (part notspec elsewher	5.45E-02	6.75E-02	1.92E-02	2.76E-02	1.69E-01	lb/day	9.94E-03	1.23E-02	3.50E-03	5.04E-03	3.08E-02	ton/yr	--	--
Sulfur Dioxide (SO2)	1.18E-02	1.46E-02	3.53E-04	5.07E-04	2.72E-02	lb/day	2.15E-03	2.66E-03	6.44E-05	9.26E-05	4.96E-03	ton/yr	--	--
Carbon Monoxide (CO) pollutant	1.24E-01	1.79E-01	2.33E-02	3.36E-02	3.60E-01	lb/day	2.27E-02	3.27E-02	4.25E-03	6.14E-03	6.57E-02	ton/yr	--	--
Carbon Dioxide, non-biogenic CO2	2.54E+03	3.13E+03	7.61E+01	1.10E+02	5.86E+03	lb/day	4.64E+02	5.72E+02	1.39E+01	2.00E+01	1.07E+03	ton/yr	--	--
Methane (CH4)	9.12E-02	1.09E-01	1.18E-03	1.70E-03	2.03E-01	lb/day	1.66E-02	1.99E-02	2.15E-04	3.10E-04	3.71E-02	ton/yr	--	--

Pollutant (HRA ONLY)	Sources				UOM
	Turbine 1	Turbine 2	Boiler 1	Boiler 2	
Acetaldehyde	1.08E-06	1.08E-06	1.45E-08	1.45E-08	g/s
Benzene	2.49E-06	2.95E-06	6.10E-09	8.78E-09	g/s
1,3-Butadiene	1.16E-08	1.16E-08	0.00E+00	0.00E+00	g/s
Ethyl benzene	8.61E-07	8.61E-07	3.22E-08	3.22E-08	g/s
Formaldehyde	3.58E-04	4.18E-04	3.02E-07	4.35E-07	g/s
Naphthalene	3.51E-08	3.51E-08	4.83E-09	4.83E-09	g/s
Propylene oxide	7.81E-07	7.81E-07	0.00E+00	0.00E+00	g/s
Total PAH (excluding Napthalene)	2.42E-08	2.42E-08	1.61E-09	1.61E-09	g/s
Acrolein	1.72E-07	1.72E-07	1.29E-08	1.29E-08	g/s
Ammonia	1.20E-03	1.20E-03	5.15E-05	5.15E-05	g/s
Hexane	0.00E+00	0.00E+00	2.09E-08	2.09E-08	g/s
Toluene	1.56E-08	4.49E-08	0.00E+00	0.00E+00	g/s
Xylene	1.72E-06	1.72E-06	9.34E-08	9.34E-08	g/s
Nitrogen Oxides (part not spec elsewher	2.86E-04	3.54E-04	1.01E-04	1.45E-04	g/s
PM2.5	6.52E-04	7.59E-04	2.48E-05	3.56E-05	g/s

1. There are two PAHs detected in gas turbines: benzo(a)anthracene and benzo(a)pyrene. Only benzo(a)pyrene is detected in boiler exhaust. Inhalation Potency Factor for benzo(a)pyrene is greater than benzo(a)anthracene, therefore the IPF for benzo(a)pyrene was used for Total PAHs.

2. From Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values, last updated September 19, 2019

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

New Emergency Diesel Generator Emissions Estimates, for RAB

List of Assumptions/References/Notes

Assume new engine to be limited to 50 hours of O&M per year.

Emissions Calculated in CalEEMod

Generator to be ~1MW

Use specification from Generac SD1000

from CalEEMod

From CalEEMod Results

Pollutant	Source ~1500hp	UOM
Diesel Engine Exhaust Particulate	2.93E-03	tpy
$PM_{2.5}$	2.93E-03	tpy

For AERMOD results

Pollutant	Source ~1500hp	UOM
Diesel Engine Exhaust Particulate	8.43E-05	g/s
$PM_{2.5}$	8.43E-05	g/s

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Fume Emissions Estimates

Based on methods certified in Mission Bay EIR (SCAQMD AB2588 Reporting Procedures for AB2588 Facilities, 12/2016.)

List of Assumptions/References/Notes

Estimate of count of fume hoods provided by UCSF

Only new fume hoods as part of the Initial Phase evaluated (i.e. RAB)

Fume hoods at UC Hall decommissioned prior to NOP

LPPI demolition was previously approved under 2014 LRDP

Only one active fume hood exist in the Nursing Building and is conservatively considered negligible

Assume new fume hoods have controls

Fume hood chemical inventory not implemented at Parnassus Camps, assume comparible to Mission Bay

Calculations

Total Fume Hoods	40	RAB

Chemical	CAS #	CPF $(mg/kg\text{-}day)^{-1}$	Chronic REL (ug/m^3)	Physical State	Vapor Pressure (mm Hg)	Liquids Specific Gravity	Total Amount Used $(lbs/yr)^1$	Constant Value[2]	Estimated Fraction Emitted	Estimated Emissions (lbs/yr)	Total # Fume Hoods[1]	Lbs/Yr per Fume Hood	Emission Factor to apply to AERMOD Outputs: Annual RAB Fume Hood Source (g/s)	Emission Factor to apply to AERMOD Outputs: Hourly RAB Fume Hood Source $(g/s)^3$
Arsenic and compounds	7440382	12	0.015	solid	0.001		0.055	NA	0.00001	0.00	14	3.93E-08	5.65E-13	2.12E-12
Benzene	71432	0.1	3	liquid	69.35	0.882	11.8	0.0001	0.006935	0.08	14	5.85E-03	8.41E-08	3.15E-07
Benzidine	92875	500	0	solid	0.1		0	NA	0.00001	0.00	14	0.00E+00	0.00E+00	0.00E+00
Benzyl chloride	100447	1.70E-01	0	liquid/solid	0.75	1.104	2.5	0.0001	0.000075	0.00	14	1.34E-05	1.93E-10	7.21E-10
Cadmium and compounds	7440439	15	0.02	solid	0		8.2	NA	0.00001	0.00	14	5.86E-06	8.42E-11	3.15E-10
Carbon tetrachloride	56235	0.15	40	liquid	85.4	1.59	29.5	0.0001	0.00854	0.25	14	1.80E-02	2.59E-07	9.69E-07
Chloroform	67663	1.90E-02	300	liquid	143.8	0.966	828.9	0.0001438	0.0206784	17.14	14	1.22E+00	1.76E-05	6.59E-05
Chromium (VI)	18540299	5.10E+02	0.2	solid	0.001		0.1	NA	0.00001	0.00	14	7.14E-08	1.03E-12	3.85E-12
Dichloroethylene, 1,1-	75354	0	70	liquid	470.6	1.25	0	0.0004706	0.2214644	0.00	14	0.00E+00	0.00E+00	0.00E+00
Dioxane, 1,4-	123911	2.70E-02	3000	liquid	26.4	1.04	45.7	0.0001	0.00264	0.12	14	8.62E-03	1.24E-07	4.64E-07
Ethylene dibromide	106934	2.50E-01	0.8	liquid	11.3	2.18	59.9	0.0001	0.00113	0.07	14	4.83E-03	6.95E-08	2.60E-07
Ethylene dichloride	107062	7.20E-02	400	liquid	54	1.25	1.4	0.0001	0.0054	0.01	14	5.40E-04	7.77E-09	2.91E-08
Formaldehyde	50000	2.10E-02	9	liquid	1	1.46	4036.8	0.0001	0.0001	0.40	14	2.88E-02	4.15E-07	1.55E-06
Hydrazine	302012	0.0049	0.2	liquid/solid	14.4	1.01	2.6	0.0001	0.00144	0.00	14	2.67E-04	3.85E-09	1.44E-08
Manganese and compounds	7439965	0	0.09	solid	0.001		1.4	NA	0.00001	0.00	14	1.00E-06	1.44E-11	5.38E-11
Mercury and compounds	7439947	0	0.03	liquid	1	13.546	0	NA	0.00001	0.00	14	0.00E+00	0.00E+00	0.00E+00
Mercuric chloride	7487947	0	0.03	solid	0.0004		1.4	0.0001	4E-08	0.00	14	4.00E-09	5.75E-14	2.15E-13
Methyl ethyl ketone	78933	0	0	liquid	65	0.805	2.8	0.0001	0.0065	0.02	14	1.30E-03	1.87E-08	7.00E-08
Methylene bis (2-chloroaniline), 4,4'-	101144	1.5	0	liquid	0.1	1.213	0	0.0001	0.00001	0.00	14	0.00E+00	0.00E+00	0.00E+00
Methylene chloride	75092	3.50E-03	400	liquid	328	1.332	203.6	0.000328	0.107584	21.90	14	1.56E+00	2.25E-05	8.42E-05
Nickel and compounds	7440020	0.91	0.014	solid	0.001		0	NA	0.00001	0.00	14	0.00E+00	0.00E+00	0.00E+00
Phosgene	75445	0	0	liquid	1130	1.43	0.6	0.00113	1.2769	0.77	14	5.47E-02	7.87E-07	2.95E-06
PAH (as benzo(a)pyrene)	50328	3.90E+00	0	liquid	0.001	1.351	0.011	0.0001	0.0000001	0.00	14	7.86E-11	1.13E-15	4.23E-15
Sulfates	14808798	0	0	solid	0.001		0	NA	0.00001	0.00	14	0.00E+00	0.00E+00	0.00E+00
Sulfuric acid/Oleum	8014957	0	1	liquid	0.001	1.97	626.3	NA	0.00001	0.01	14	4.47E-04	6.43E-09	2.41E-08
Vinyl chloride	75014	0.27	0	liquid/solid	2660	1.406	0	0.00266	7.0756	0.00	14	0.00E+00	0.00E+00	0.00E+00
Ethyl Benzene	100414	8.70E-03	2000	liquid	7.51	0.867	69.9	0.0001	0.000751	0.05	14	3.75E-03	5.39E-08	2.02E-07
Nitric Acid	7697372	0	0	liquid	48	1.5	239.3	0.0001	0.0048	1.15	14	8.20E-02	1.18E-06	4.42E-06
Sodium Hydroxide	1310732	0	0	liquid	0.001	1.5	8881.7	NA	0.00001	0.09	14	6.34E-03	9.12E-08	3.42E-07
Copper	7440508	0	0	solid	0.001		0.8	NA	0.00001	0.00	14	5.71E-07	8.22E-12	3.08E-11

1. Chemical Inventory and fume hood count from Mission Bay 2018 (Atmospheric Dynamics, Inc, 2019. Health Risk Assessment Final Report Submittal - UCSF Mission Bay Campus. May 2019)

2. Constant value used in equation to determine the fraction emitted. The methodology and subsequent equation are as follows: (Atmospheric Dynamics, Inc, 2018. Memorandum to Paul Franke, UCSF. Subject: Draft Fume Hood Emissions Quantification Methodology (Revised). December 3, 2018)

Fraction emitted = (substance VP)*(constant value)

Where,

VP = Vapor pressure at 25°C

Constant Value =

VP <= 100 mmHg, then use 0.0001

VP > 100 mmHg, then use VP/100 * 0.0001

-or-

if chemical listed below, then Fraction emitted = 0.00001

Determined list from memo

Arsenic and compounds
Benzidine
Cadmium and compounds
Chromium (VI)
Manganese and compounds
Mercury and compounds
Nickel and compounds
Sulfates
Sulfuric acid/Oleum
Sodium Hydroxide
Copper

3. Hours of operation were based on Mission Bay HRA assumption of 2340 hour/year

AIR AERMOD Model Inputs (Summary Tables)

Table AIR-1

Overall AERMOD Modeling Parameters

Pathway	Description	Parameter
Control	Averaging Time	Period average, 1-Hour Maximum
	Urban Population	884,363 [a]
	Model Version	AERMOD v18081
Source	Spacing	*See Table AIR-2 and Table AIR-3*
	Release Height	*See Table AIR-2 and Table AIR-3*
	Initial Vertical Dimension	*See Table AIR-2 and Table AIR-3*
	Initial Lateral Dimension	*See Table AIR-2 and Table AIR-3*
	Variable Emission Factor	*See Table AIR-2 and Table AIR-3*
Buildings	Building Downwash Included?	Construction Model: No Operational Model: Yes
Terrain	Horizontal Datum	NAD 83
	National Elevation Dataset	1/3 arc-second
Receptor	Receptor Height, all	1.8m [b]
	Grid	20m x 20m [b]
Meteorology	Surface Data	San Francisco International Airport (Site # 23234) [c]
	On-Site Station	Mission Bay (Site #5803) [c]
	Upper Air	Oakland (Site #23230) [c]
	Station Elevation	2.0 m
	MET Data Years	2008-2012

NOTES:

[a] For 2017, City of San Francisco (US Census Bureau 2019).

[b] from the CRRP-HRA (BAAQMD, SF DPH & SF Planning, 2012)

[c] from BAAQMD, stations consistent with the CRRP-HRA (BAAQMD, SF DPH & SF Planning, 2012)

SOURCES:

1. United States Census Bureau. 2016. QuickFacts: San Francisco city, California. Available at https://www.census.gov/quickfacts/table/PST045216/0667000,00. Accessed May 2019.

2. Bay Area Air Quality Management District, San Francisco Department of Public Health, and San Francisco Planning Department. 2012. The San Francisco Community Risk Reduction Plan: Technical Support Documentation. December. Available at http://www.gsweventcenter.com/Appeal_Response_References/2012_1201_BAAQMD.pdf. Accessed May 2019.

3. California Air Resources Board. 2015. Meteorological Files. Available at https://www.arb.ca.gov/toxics/harp/metfiles2.htm. Accessed May 2019.

ABBREVIATIONS:

AERMOD = American Meteorological Society/Environmental Protection Agency regulatory air dispersion model
NAD = North American Datum
m = meters

Table AIR-2
Source Modeling Parameters

Period	Source	Source Type [a]	Variable Emissions	Number of Sources [b]	Release Height [c] [m]	Initial Vertical Dimension [d] [m]	Source Area [e] [m²]	Source Length [f] [m]	Source Width [g] [m]
Construction	Off-Road Construction Equipment	Area	Factor of 1.85 applied to MET hours [08-20] Factor of 0 for all other hours	4	5	1.4	11,080 (RAB) 1911 (ISA) 4957 (New Hospital) 6239 (Aldea Housing)	n/a	n/a
	Haul Truck Idling	Area	Factor of 1.85 applied to MET hours [08-20] Factor of 0 for all other hours	4	2.55	2.37	11,080 (RAB) 1911 (ISA) 4957 (New Hospital) 6239 (Aldea Housing)	n/a	n/a
	On-Road Trucks - Campus Construction	Line Area	Factor of 1.85 applied to MET hours [08-20] Factor of 0 for all other hours	—	2.55	2.37	n/a	841	18
	On-Road Trucks- Aldea Construction	Line Area	Factor of 1.85 applied to MET hours [08-20] Factor of 0 for all other hours	—	2.55	2.37	n/a	843	18
	On-Road Trucks- Aldea Construction [h]	Line Area	Factor of 1.85 applied to MET hours [08-20] Factor of 0 for all other hours	—	2.55	2.37	n/a	308	12
Operations	Emergency Diesel Generator (RAB)	Stack	No variable emissions	1	41.5	n/a	*see Table AIR-3 for additional source parameters*		
	Fume Hoods -1 thru 40 (RAB)	Stack	No variable emissions	40	41.5	n/a	*see Table AIR-3 for additional source parameters*		
	CUP - Boiler 1 and Boiler 2	Stack	No variable emissions	2	24.7	n/a	*see Table AIR-3 for additional source parameters*		
	CUP - CT1+DB1 and CT2+DB2	Stack	No variable emissions	2	24.7	n/a	*see Table AIR-3 for additional source parameters*		

NOTES:

[a] Construction is modeled as an area source covering the project site, consistent with the CRRP-HRA (BAAQMD, SF DPH & SF Planning, 2012).

[b] The number of on-road mobile sources is based on the geometry of the truck or traffic routes.

[c] Release height for off-road construction equipment and on-road operational mobile sources from the CRRP-HRA (BAAQMD, SF DPH & SF Planning, 2012). For on-road construction trucks and operational delivery truck idling at street-level, the release height is equal to 0.5 * top of plume height, which is equal to 1.7 * the vehicle height, which is equal to 3 meters; equation = 0.5 * 1.7 * 3 = 2.55 (USEPA 2012).

[d] Initial vertical dimension for off-road construction equipment and on-road operational mobile sources from the CRRP-HRA (BAAQMD, SF DPH & SF Planning, 2012). Initial vertical dimension for on-road construction trucks and truck idling is equal to the top of the plume height ÷ 2.15 = 1.7 * 3 / 2.15 = 2.37.

[e] Area value generated by AERMOD.

[f] Length value generated by AERMOD.

[g] Roadway side length includes road lane widths plus mixing zone.

[h] Roadway represents haul truck route entering Aldea housing/parking area.

SOURCES:

1. United States Environmental Protection Agency. 2012. Haul Road Workgroup Final Report Submission to EPA-OAQPS. March. Available at: https://www3.epa.gov/scram001/reports/Haul_Road_Workgroup-
2. United States Environmental Protection Agency. 2016a. User's Guide for the AMS/EPA Regulatory Model – AERMOD. December. Available at https://www3.epa.gov/ttn/scram/models/aermod/aermod_userguide.pdf. Accessed November 2019.
3. Bay Area Air Quality Management District, San Francisco Department of Public Health, and San Francisco Planning Department. 2012. The San Francisco Community Risk Reduction Plan: Technical Support Documentation. December. Available at http://www.gsweventcenter.com/Appeal_Response_References/2012_1201_BAAQMD.pdf. Accessed November 2019.

ABBREVIATIONS:

ISA = Irving Street Arrival
RAB = Research and Academic Building
m = meters

Table AIR-3

Stack Source Modeling Parameters

Period	Source	Source Type	Variable Emissions	Number of Sources	Release Height [a] [m]	Gas Exit Temperature [b] [K]	Stack Inside Diameter [c] [m]	Gas Exit Velocity [d] [m/s]	Gas Exit Flow Rate [e] [m^3/s]
Operations	Emergency Diesel Generator (RAB)	Stack	No variable emissions	1	41.5	819.3	0.3	--	4.5
	Fume Hoods - 1 thru 40 (RAB)	Stack	No variable emissions	40	41.5	293	1.5	12.7	--
	CUP - Boiler 1 and Boiler 2	Stack	No variable emissions	2	24.7	409.3	1.2	--	8.0
	CUP - CT1+DB1 and CT2+DB2	Stack	No variable emissions	2	24.7	411.5	1.2	--	28.7

NOTES:

[a] Release height for emergency generator and fume hood stacks are 20 ft + Building height per P. Franke (UCSF). Release heights for CUP are from P-Forms submitted with permit application #10962 (BAAQMD, 1993)

[b] Gas exit temperatures for CUP are from P-Forms submitted with permit application #10962 (BAAQMD, 1993). Fume hood exit temperatures consistent with HRA for USCF Mission Bay Campus (Atmospheric Dynamnics, Inc., 2019). Emergency diesel parameters obtain from specification sheet for a 1 MW EDG (Generac, 2015).

[c] Stack diameter for CUP are from P-Forms submitted with permit application #10962 (BAAQMD, 1993). Fume hood parameters consistent with HRA for USCF Mission Bay Campus (Atmospheric Dynamnics, Inc., 2019). Emergency diesel parameters obtain from specification sheet for a 1 MW EDG (Generac, 2015).

[d] Fume hood parameters consistent with HRA for USCF Mission Bay Campus (Atmospheric Dynamnics, Inc., 2019). AERMOD only requires the exit velocity or the flow rate and calculates the remaining input.

[e] Stack flow rate for CUP are from P-Forms submitted with permit application #10962 (BAAQMD, 1993). Emergency diesel parameters obtain from specification sheet for a 1 MW EDG (Generac, 2015). AERMOD only requires the exit velocity or the flow rate and calculates the remaining input.

SOURCES:

1. Atmospheric Dynamics, Inc., 2019. Health Risk Assessment Final Report Submittal UCSF Mission Bay Campus. May 2019.

2. Generac Power Systems, Inc., 2015. SD1000 Spec Sheet. Available: https://legacy.genconnect.generac.com/Media/vwDoc.axd?d=031903a3-b258-49bb-91bf-cffb7447863c

3. BAAQMD, 1993. New/Modified Industrial Permit Application (Application #10962). Received via public records requested, available: http://www.baaqmd.gov/contact-us/request-public-records

ABBREVIATIONS:

K = degrees Kelvin

m = meters

RAB = Research and Academic Building

s = seconds

AIR Construction HRA Calculations (Unmitigated)

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Summary of Project Level Impacts by Project

ISA

Unmitigated

			Project			
Receptor Type	UTM E	UTM N	Cancer Risk	Hazard Index	$PM_{2.5}$	Location
Offsite Res	547740	4179820	24.99	0.02	0.09	pot. res.
Onsite Res	547600	4179760	5.33	0.00	0.02	3rd Ave Housing
Daycare	547560	4179680	1.18	0.00	0.01	Lucia Child Care Center
School	548260	4179640	0.07	0.00	0.01	Haight Ashbury Community Nursery School

Mitigated

			Project			
Receptor Type	UTM E	UTM N	Cancer Risk	Hazard Index	$PM_{2.5}$	Location
Offsite Res	547860	4179780	1.17	0.00	0.00	pot. res.
Onsite Res	547600	4179760	0.30	0.00	0.00	3rd Ave Housing
Daycare	547560	4179680	0.07	0.00	0.00	Lucia Child Care Center
School	548260	4179640	0.00	0.00	0.00	Haight Ashbury Community Nursery School

RAB

Unmitigated

			Project			
Receptor Type	UTM E	UTM N	Cancer Risk	Hazard Index	$PM_{2.5}$	Location
Offsite Res	547520	4179640	51.03	0.04	0.16	pot. res.
Onsite Res	547600	4179700	25.50	0.02	0.08	3rd Ave Housing
Daycare	547560	4179660	19.98	0.04	0.17	Lucia Child Care Center
School	548260	4179620	0.19	0.00	0.01	Haight Ashbury Community Nursery School

Mitigated

			Project			
Receptor Type	UTM E	UTM N	Cancer Risk	Hazard Index	$PM_{2.5}$	Location
Offsite Res	547520	4179640	2.91	0.00	0.01	pot. res.
Onsite Res	547600	4179700	1.44	0.00	0.00	3rd Ave Housing
Daycare	547560	4179660	1.10	0.00	0.01	Lucia Child Care Center
School	548260	4179620	0.01	0.00	0.00	Haight Ashbury Community Nursery School

NH

Unmitigated

Receptor Type	UTM E	UTM N	Project			Location
			Cancer Risk	Hazard Index	$PM_{2.5}$	
Offsite Res	547980	4179760	67.06	0.04	0.19	pot. res.
Onsite Res	547600	4179700	6.54	0.00	0.02	3rd Ave Housing
Daycare	547560	4179660	1.91	0.00	0.02	Lucia Child Care Center
School	548260	4179640	0.50	0.01	0.03	Haight Ashbury Community Nursery School

Mitigated

Receptor Type	UTM E	UTM N	Project			Location
			Cancer Risk	Hazard Index	$PM_{2.5}$	
Offsite Res	547980	4179760	4.72	0.00	0.01	pot. res.
Onsite Res	547600	4179700	0.50	0.00	0.00	3rd Ave Housing
Daycare	547560	4179660	0.16	0.00	0.00	Lucia Child Care Center
School	548260	4179640	0.04	0.00	0.00	Haight Ashbury Community Nursery School

AHD

Unmitigated

Receptor Type	UTM E	UTM N	Project			Location
			Cancer Risk	Hazard Index	$PM_{2.5}$	
Offsite Res	548040	4178980	8.99	0.10	0.06	pot. res.
Onsite Res	547980	4179080	60.81	0.09	0.42	Aldea Housing
Daycare	547480	4179400	0.07	0.00	0.00	Kirkham Child Care Center
School	547900	4178680	0.01	0.00	0.00	Clarendon Alternative Elementary

Mitigated

Receptor Type	UTM E	UTM N	Project			Location
			Cancer Risk	Hazard Index	$PM_{2.5}$	
Offsite Res	548040	4178980	0.67	0.00	0.00	pot. res.
Onsite Res	547980	4179080	4.53	0.01	0.03	Aldea Housing
Daycare	547480	4179400	0.01	0.00	0.00	Kirkham Child Care Center
School	547940	4178680	0.00	0.00	0.00	Clarendon Alternative Elementary

UCSF Parnassus Heights LRDP
Initial Phase of LRDP (2030)
Unmitigated Irving Street Arrival Construction Cancer Risk Calculations for Residential Child Receptor

Haul Truck Trip Adjustment Factor to Model

	One Way (miles)				
	ISA	RAB	HDMC	IAH1	IAH2
CalEEMod, Haul	20	20	20	20	20
CalEEMod, Vend	7.3	7.3	7.3	7.3	7.3
AERMOD	0.52	0.52	0.52	0.52	0.19
% in Dispersion Model, Haul	3%	3%	3%	3%	1%
% in Dispersion Model, Vend	7%	7%	7%	7%	3%

haul truck trip distance as modeled in CalEEMod
vendor trip distance as modeled in CalEEMod

Construction Emissions, *as applied to AERMOD results*

				Days				Total Umitigated DPM (tons)				Total Umitigated DPM (g/s)			
	Year	Start Date	Stop Date	3rd Trimester	0<2	2<9	Duration	Offroad	Haul/Vend1	Haul/Vend2	Idle	Offroad	Haul1	Haul2	Idle
Irving Street Arrival	2022	3/1/2022	12/31/2022	91.00	215.00	0	306	4.56E-02	5.74E-06	--	1.77E-06	1.56E-03	1.97E-07	--	6.07E-08
	2023	1/1/2023	11/30/2023	0.00	334.00	0	334	3.85E-02	4.29E-06	--	0.00E+00	1.21E-03	1.35E-07	--	0.00E+00

Risk Factors

	Abbreviation	UOM	3rd Trimester	0<2	2<9
Daily Breathing Rate (95th %'ile)	DBR	L/kg-day	361	1090	631
Fraction Of Time At Home	FAH	unitless	1	1	1
Exposure Frequency	EF	days/year	0.96	0.96	0.96
Age Sensitivity Factor	ASF	unitless	10	10	3
Inhalation Absorption Factor	A	unitless	1	1	1
Conversion Factor	CF_1	m^3/L	0.001	0.001	0.001
Conversion Factor	CF_2	$\mu g/m^3$	0.001	0.001	0.001
Cancer Potency Factor (diesel exhaust)	CPF	$mg/kg\text{-}day^{-1}$	1.1	1.1	1.1
Averaging Time (for residential exposure)	AT	years	70.00	70.00	70.00

Intake Factor for Inhalation, IF (m^3/kg-day)

	Year	Equation	3rd Trimester	0<2	2<9
Irving Street Arrival	2022	DBR*FAH*EF *ED*ASF*A* CF/AT	0.012	0.088	0.000
	2023		0.000	0.137	0.000

Risk Calculation Part 1, R1

	3rd Trimester	0<2	2<9
IF*CPF*CF	1.36E-05	9.67E-05	0.00E+00
	0.00E+00	1.50E-04	0.00E+00

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

		ISA	
X (UTM)	Y (UTM	2022	2023
547740	4179820	0.110	0.085
547860	4179800	0.093	0.072
547860	4179780	0.093	0.072
547860	4179820	0.083	0.064
547760	4179840	0.076	0.059
547860	4179840	0.074	0.057
547840	4179860	0.062	0.048
547740	4179840	0.059	0.046
547700	4179820	0.059	0.046
547860	4179860	0.057	0.044
547880	4179860	0.051	0.039
547900	4179820	0.049	0.038
547720	4179840	0.048	0.037
547900	4179840	0.044	0.034
547760	4179860	0.044	0.034
547900	4179860	0.044	0.034
547680	4179820	0.044	0.034
547840	4179880	0.042	0.033
547860	4179880	0.041	0.032
547820	4179880	0.041	0.032
547920	4179820	0.040	0.031
547700	4179840	0.039	0.030
547880	4179880	0.039	0.030
547800	4179880	0.037	0.029
547740	4179860	0.037	0.029
547940	4179800	0.037	0.028
547920	4179860	0.036	0.028
547900	4179880	0.036	0.028
547940	4179820	0.034	0.027
547920	4179840	0.034	0.026
547660	4179820	0.033	0.026
547780	4179880	0.032	0.025
547920	4179880	0.032	0.025
547960	4179800	0.032	0.025
547940	4179860	0.032	0.025
547940	4179840	0.032	0.025
547720	4179860	0.031	0.024
547680	4179840	0.031	0.024
547960	4179820	0.031	0.024
547980	4179780	0.031	0.024
547960	4179840	0.030	0.024
547960	4179860	0.030	0.023
547860	4179900	0.030	0.023
547880	4179900	0.030	0.023
547980	4179800	0.029	0.023
547940	4179880	0.029	0.023
547840	4179900	0.029	0.023
547980	4179820	0.029	0.022
547980	4179760	0.029	0.022
547980	4179840	0.029	0.022
547760	4179880	0.028	0.022
547900	4179900	0.028	0.022
548000	4179780	0.028	0.022
547820	4179900	0.028	0.021
548000	4179800	0.027	0.021
547700	4179860	0.027	0.021
547980	4179860	0.027	0.021
548000	4179820	0.027	0.021
547920	4179900	0.027	0.021
547960	4179880	0.026	0.020
548020	4179780	0.026	0.020
547640	4179820	0.026	0.020
548000	4179840	0.026	0.020
548020	4179800	0.025	0.020
548000	4179760	0.025	0.020
547660	4179840	0.025	0.020
547740	4179880	0.025	0.019
547940	4179900	0.025	0.019
547800	4179900	0.025	0.019
548020	4179820	0.024	0.019
547980	4179740	0.024	0.019
548000	4179860	0.024	0.019
548040	4179780	0.024	0.019
547980	4179880	0.024	0.018
548040	4179800	0.024	0.018
548020	4179840	0.023	0.018
548020	4179760	0.023	0.018
547680	4179860	0.023	0.018
548040	4179820	0.023	0.018
547960	4179900	0.023	0.018

Risk Calculation Part 2

	∑R1*C_{DPM}				Cancer Risk	
3rd Trimeste	0<2	2<9	Total	per million	Receptor Determination
1.50E-06	2.35E-05	0.00E+00	2.50E-05	24.99	pot. res.
1.26E-06	1.98E-05	0.00E+00	2.11E-05	21.05	pot. res.
1.26E-06	1.97E-05	0.00E+00	2.10E-05	20.99	pot. res.
1.13E-06	1.77E-05	0.00E+00	1.88E-05	18.84	pot. res.
1.03E-06	1.62E-05	0.00E+00	1.72E-05	17.18	pot. res.
1.00E-06	1.57E-05	0.00E+00	1.67E-05	16.71	pot. res.
8.37E-07	1.32E-05	0.00E+00	1.40E-05	13.99	pot. res.
8.04E-07	1.26E-05	0.00E+00	1.34E-05	13.44	pot. res.
8.00E-07	1.26E-05	0.00E+00	1.34E-05	13.36	pot. res.
7.69E-07	1.21E-05	0.00E+00	1.28E-05	12.85	pot. res.
6.87E-07	1.08E-05	0.00E+00	1.15E-05	11.48	pot. res.
6.67E-07	1.05E-05	0.00E+00	1.11E-05	11.15	pot. res.
6.55E-07	1.03E-05	0.00E+00	1.09E-05	10.94	pot. res.
5.97E-07	9.37E-06	0.00E+00	9.97E-06	9.97	pot. res.
5.95E-07	9.35E-06	0.00E+00	9.95E-06	9.95	pot. res.
5.91E-07	9.29E-06	0.00E+00	9.88E-06	9.88	pot. res.
5.90E-07	9.28E-06	0.00E+00	9.87E-06	9.87	pot. res.
5.73E-07	9.00E-06	0.00E+00	9.58E-06	9.58	pot. res.
5.60E-07	8.79E-06	0.00E+00	9.35E-06	9.35	pot. res.
5.56E-07	8.73E-06	0.00E+00	9.28E-06	9.28	pot. res.
5.41E-07	8.50E-06	0.00E+00	9.04E-06	9.04	pot. res.
5.27E-07	8.27E-06	0.00E+00	8.80E-06	8.80	pot. res.
5.26E-07	8.26E-06	0.00E+00	8.79E-06	8.79	pot. res.
5.04E-07	7.91E-06	0.00E+00	8.42E-06	8.42	pot. res.
5.00E-07	7.86E-06	0.00E+00	8.36E-06	8.36	pot. res.
4.98E-07	7.83E-06	0.00E+00	8.33E-06	8.33	pot. res.
4.85E-07	7.62E-06	0.00E+00	8.10E-06	8.10	pot. res.
4.84E-07	7.60E-06	0.00E+00	8.08E-06	8.08	pot. res.
4.66E-07	7.31E-06	0.00E+00	7.78E-06	7.78	pot. res.
4.61E-07	7.25E-06	0.00E+00	7.71E-06	7.71	pot. res.
4.51E-07	7.08E-06	0.00E+00	7.53E-06	7.53	pot. res.
4.41E-07	6.92E-06	0.00E+00	7.36E-06	7.36	pot. res.
4.40E-07	6.91E-06	0.00E+00	7.35E-06	7.35	pot. res.
4.36E-07	6.84E-06	0.00E+00	7.28E-06	7.28	pot. res.
4.35E-07	6.84E-06	0.00E+00	7.27E-06	7.27	pot. res.
4.32E-07	6.79E-06	0.00E+00	7.22E-06	7.22	pot. res.
4.26E-07	6.69E-06	0.00E+00	7.12E-06	7.12	pot. res.
4.22E-07	6.63E-06	0.00E+00	7.05E-06	7.05	pot. res.
4.19E-07	6.58E-06	0.00E+00	7.00E-06	7.00	pot. res.
4.17E-07	6.55E-06	0.00E+00	6.97E-06	6.97	pot. res.
4.12E-07	6.48E-06	0.00E+00	6.89E-06	6.89	pot. res.
4.07E-07	6.40E-06	0.00E+00	6.81E-06	6.81	pot. res.
4.07E-07	6.39E-06	0.00E+00	6.79E-06	6.79	pot. res.
4.00E-07	6.28E-06	0.00E+00	6.68E-06	6.68	pot. res.
3.98E-07	6.25E-06	0.00E+00	6.65E-06	6.65	pot. res.
3.98E-07	6.25E-06	0.00E+00	6.65E-06	6.65	pot. res.
3.98E-07	6.25E-06	0.00E+00	6.64E-06	6.64	pot. res.
3.89E-07	6.11E-06	0.00E+00	6.50E-06	6.50	pot. res.
3.89E-07	6.11E-06	0.00E+00	6.50E-06	6.50	pot. res.
3.87E-07	6.08E-06	0.00E+00	6.47E-06	6.47	pot. res.
3.86E-07	6.07E-06	0.00E+00	6.46E-06	6.46	pot. res.
3.83E-07	6.02E-06	0.00E+00	6.40E-06	6.40	pot. res.
3.82E-07	6.00E-06	0.00E+00	6.38E-06	6.38	pot. res.
3.74E-07	5.88E-06	0.00E+00	6.25E-06	6.25	pot. res.
3.69E-07	5.79E-06	0.00E+00	6.16E-06	6.16	pot. res.
3.64E-07	5.72E-06	0.00E+00	6.09E-06	6.09	pot. res.
3.64E-07	5.71E-06	0.00E+00	6.08E-06	6.08	pot. res.
3.60E-07	5.66E-06	0.00E+00	6.02E-06	6.02	pot. res.
3.60E-07	5.65E-06	0.00E+00	6.01E-06	6.01	pot. res.
3.58E-07	5.63E-06	0.00E+00	5.99E-06	5.99	pot. res.
3.52E-07	5.53E-06	0.00E+00	5.88E-06	5.88	pot. res.
3.49E-07	5.48E-06	0.00E+00	5.83E-06	5.83	pot. res.
3.46E-07	5.44E-06	0.00E+00	5.79E-06	5.79	pot. res.
3.45E-07	5.42E-06	0.00E+00	5.76E-06	5.76	pot. res.
3.44E-07	5.40E-06	0.00E+00	5.74E-06	5.74	pot. res.
3.42E-07	5.37E-06	0.00E+00	5.72E-06	5.72	pot. res.
3.39E-07	5.33E-06	0.00E+00	5.67E-06	5.67	pot. res.
3.34E-07	5.25E-06	0.00E+00	5.58E-06	5.58	pot. res.
3.33E-07	5.24E-06	0.00E+00	5.57E-06	5.57	pot. res.
3.31E-07	5.20E-06	0.00E+00	5.53E-06	5.53	pot. res.
3.26E-07	5.12E-06	0.00E+00	5.44E-06	5.44	pot. res.
3.25E-07	5.10E-06	0.00E+00	5.43E-06	5.43	pot. res.
3.25E-07	5.10E-06	0.00E+00	5.42E-06	5.42	pot. res.
3.23E-07	5.07E-06	0.00E+00	5.40E-06	5.40	pot. res.
3.22E-07	5.05E-06	0.00E+00	5.37E-06	5.37	pot. res.
3.18E-07	5.00E-06	0.00E+00	5.31E-06	5.31	pot. res.
3.10E-07	4.87E-06	0.00E+00	5.18E-06	5.18	pot. res.
3.10E-07	4.86E-06	0.00E+00	5.17E-06	5.17	pot. res.
3.09E-07	4.85E-06	0.00E+00	5.16E-06	5.16	pot. res.
3.08E-07	4.83E-06	0.00E+00	5.14E-06	5.14	pot. res.

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Unmitigated Research and Academic Building Construction Cancer Risk Calculations for Residential Child Receptor

Haul Truck Trip Adjustment Factor to Model

	One Way (miles)					
	ISA	RAB	HDMC	IAH1	IAH2	
CalEEMod, Haul	20	20	20	20	20	*haul truck trip distance as modeled in CalEEMod*
CalEEMod, Vend	7.3	7.3	7.3	7.3	7.3	*vendor trip distance as modeled in CalEEMod*
AERMOD	0.52	0.52	0.52	0.52	0.19	
% in Dispersion Model, Haul	3%	3%	3%	3%	1%	
% in Dispersion Model, Vend	7%	7%	7%	7%	3%	

Construction Emissions, *as applied to AERMOD results*

				Days				Total Umitigated DPM (tons)				Total Umitigated DPM (g/s)			
	Year	Start Date	Stop Date	3rd Trimester	0<2	2<9	Duration	Offroad	Haul/Vend1	Haul/Vend2	Idle	Offroad	Haul1	Haul2	Idle
Research and Academic Building	2022	3/1/2022	12/31/2022	91.00	215.00	0.00	306					4.68E-03	3.70E-06	--	2.20E-06
	2023	1/1/2023	12/31/2023	0.00	365.00	0.00	365					2.29E-03	1.52E-06	--	0.00E+00
	2024	1/1/2024	12/31/2024	0.00	150.00	216.00	366					2.25E-03	1.46E-06	--	0.00E+00
	2025	1/1/2025	12/31/2025	0.00	0.00	365.00	365					1.96E-03	1.40E-06	--	0.00E+00

Risk Factors

	Abbreviation	UOM	3rd Trimester	0<2	2<9
Daily Breathing Rate (95th %'ile)	DBR	L/kg-day	361	1090	631
Fraction Of Time At Home	FAH	unitless	1	1	1
Exposure Frequency	EF	days/year	0.96	0.96	0.96
Age Sensitivity Factor	ASF	unitless	10	10	3
Inhalation Absorption Factor	A	unitless	1	1	1
Conversion Factor	CF_1	m^3/L	0.001	0.001	0.001
Conversion Factor	CF_2	$\mu g/m^3$	0.001	0.001	0.001
Cancer Potency Factor (diesel exhaust)	CPF	$mg/kg\text{-}day^{-1}$	1.1	1.1	1.1
Averaging Time (for residential exposure)	AT	years	70.00	70.00	70.00

Intake Factor for Inhalation, IF (m^3/kg-day)

	Year	Equation	3rd Trimester	0<2	2<9
Research and Academic Building	2022	DBR*FAH*EF *ED*ASF*A* CF/AT	0.012	0.088	0.000
	2023		0.000	0.149	0.000
	2024		0.000	0.061	0.015
	2025		0.000	0.000	0.026

Risk Calculation Part 1, R1

	3rd Trimester	0<2	2<9
IF*CPF*CF	1.36E-05	9.67E-05	0.00E+00
	0.00E+00	1.64E-04	0.00E+00
	0.00E+00	6.75E-05	1.69E-05
	0.00E+00	0.00E+00	2.86E-05

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

		RAB			
X (UTM)	Y (UTM	2021	2022	2023	2024
547520	4179640	0.210	0.103	0.101	0.088
547500	4179640	0.149	0.073	0.072	0.062
547520	4179660	0.125	0.061	0.060	0.052
547440	4179580	0.125	0.061	0.060	0.052
547460	4179620	0.119	0.058	0.057	0.050
547440	4179540	0.115	0.056	0.055	0.048
547480	4179640	0.113	0.055	0.054	0.047
547440	4179600	0.108	0.053	0.052	0.045
547500	4179660	0.097	0.047	0.046	0.040
547440	4179520	0.096	0.047	0.046	0.040
547420	4179580	0.087	0.042	0.042	0.036
547440	4179620	0.086	0.042	0.041	0.036
547460	4179640	0.086	0.042	0.041	0.036
547520	4179680	0.082	0.040	0.039	0.034
547560	4179700	0.081	0.039	0.039	0.034
547480	4179660	0.079	0.038	0.038	0.033
547420	4179600	0.077	0.038	0.037	0.032
547440	4179500	0.077	0.037	0.037	0.032
547540	4179700	0.068	0.033	0.033	0.029
547500	4179680	0.067	0.033	0.032	0.028
547400	4179560	0.067	0.033	0.032	0.028
547440	4179640	0.066	0.032	0.032	0.028
547400	4179540	0.066	0.032	0.032	0.028
547420	4179620	0.064	0.031	0.031	0.027
547400	4179580	0.064	0.031	0.031	0.027
547460	4179660	0.063	0.031	0.030	0.026
547580	4179720	0.063	0.031	0.030	0.026
547400	4179520	0.061	0.030	0.030	0.026
547440	4179480	0.061	0.030	0.029	0.026
547520	4179700	0.058	0.029	0.028	0.024
547400	4179600	0.058	0.028	0.028	0.024
547480	4179680	0.058	0.028	0.028	0.024
547560	4179720	0.057	0.028	0.027	0.024
547400	4179500	0.055	0.027	0.026	0.023
547380	4179540	0.052	0.026	0.025	0.022
547420	4179640	0.052	0.026	0.025	0.022
547380	4179560	0.052	0.026	0.025	0.022
547440	4179660	0.052	0.025	0.025	0.022
547380	4179520	0.050	0.025	0.024	0.021
547500	4179700	0.050	0.025	0.024	0.021
547540	4179720	0.050	0.024	0.024	0.021
547380	4179580	0.050	0.025	0.024	0.021
547400	4179620	0.050	0.024	0.024	0.021
547440	4179460	0.050	0.024	0.024	0.021
547460	4179680	0.048	0.024	0.023	0.020
547400	4179480	0.048	0.023	0.023	0.020
547380	4179500	0.046	0.023	0.022	0.019
547380	4179600	0.046	0.022	0.022	0.019
547580	4179740	0.045	0.022	0.022	0.019
547480	4179700	0.044	0.022	0.021	0.018
547520	4179720	0.044	0.021	0.021	0.018
547420	4179660	0.042	0.021	0.020	0.018
547360	4179540	0.042	0.021	0.020	0.018
547400	4179640	0.042	0.021	0.020	0.018
547380	4179480	0.042	0.020	0.020	0.017
547360	4179560	0.042	0.020	0.020	0.017
547560	4179740	0.042	0.020	0.020	0.017
547440	4179440	0.041	0.020	0.020	0.017
547400	4179460	0.041	0.020	0.020	0.017
547360	4179520	0.041	0.020	0.020	0.017
547440	4179680	0.041	0.020	0.020	0.017

Risk Calculation Part 2

	$\sum R1*C_{DPM}$			Cancer Risk	Receptor
3rd Trimeste	0<2	2<9	Total	per million	Determination
2.84E-06	4.40E-05	4.21E-06		5.10E-05	51.03 pot. res.
2.03E-06	3.13E-05	3.00E-06		3.64E-05	36.37 pot. res.
1.69E-06	2.61E-05	2.50E-06		3.03E-05	30.30 pot. res.
1.69E-06	2.61E-05	2.50E-06		3.03E-05	30.30 pot. res.
1.62E-06	2.50E-05	2.39E-06		2.90E-05	29.00 pot. res.
1.56E-06	2.41E-05	2.31E-06		2.80E-05	28.00 pot. res.
1.53E-06	2.37E-05	2.27E-06		2.75E-05	27.52 pot. res.
1.46E-06	2.26E-05	2.16E-06		2.62E-05	26.24 pot. res.
1.31E-06	2.02E-05	1.94E-06		2.35E-05	23.48 pot. res.
1.30E-06	2.01E-05	1.92E-06		2.33E-05	23.27 pot. res.
1.18E-06	1.82E-05	1.74E-06		2.11E-05	21.08 pot. res.
1.17E-06	1.80E-05	1.72E-06		2.09E-05	20.90 pot. res.
1.16E-06	1.80E-05	1.72E-06		2.09E-05	20.85 pot. res.
1.11E-06	1.71E-05	1.64E-06		1.99E-05	19.88 pot. res.
1.09E-06	1.69E-05	1.62E-06		1.96E-05	19.62 pot. res.
1.06E-06	1.65E-05	1.58E-06		1.91E-05	19.10 pot. res.
1.04E-06	1.61E-05	1.54E-06		1.87E-05	18.73 pot. res.
1.04E-06	1.60E-05	1.54E-06		1.86E-05	18.62 pot. res.
9.26E-07	1.43E-05	1.37E-06		1.66E-05	16.61 pot. res.
9.15E-07	1.42E-05	1.35E-06		1.64E-05	16.42 pot. res.
9.07E-07	1.40E-05	1.34E-06		1.63E-05	16.27 pot. res.
8.96E-07	1.38E-05	1.33E-06		1.61E-05	16.07 pot. res.
8.94E-07	1.38E-05	1.32E-06		1.60E-05	16.03 pot. res.
8.70E-07	1.34E-05	1.29E-06		1.56E-05	15.60 pot. res.
8.72E-07	1.35E-05	1.29E-06		1.56E-05	15.63 pot. res.
8.54E-07	1.32E-05	1.26E-06		1.53E-05	15.32 pot. res.
8.53E-07	1.32E-05	1.26E-06		1.53E-05	15.30 pot. res.
8.33E-07	1.29E-05	1.23E-06		1.49E-05	14.95 pot. res.
8.28E-07	1.28E-05	1.23E-06		1.49E-05	14.86 pot. res.
7.89E-07	1.22E-05	1.17E-06		1.42E-05	14.16 pot. res.
7.88E-07	1.22E-05	1.17E-06		1.41E-05	14.13 pot. res.
7.82E-07	1.21E-05	1.16E-06		1.40E-05	14.03 pot. res.
7.69E-07	1.19E-05	1.14E-06		1.38E-05	13.80 pot. res.
7.42E-07	1.15E-05	1.10E-06		1.33E-05	13.32 pot. res.
7.11E-07	1.10E-05	1.05E-06		1.27E-05	12.75 pot. res.
7.09E-07	1.10E-05	1.05E-06		1.27E-05	12.72 pot. res.
7.10E-07	1.10E-05	1.05E-06		1.27E-05	12.73 pot. res.
7.01E-07	1.08E-05	1.04E-06		1.26E-05	12.57 pot. res.
6.80E-07	1.05E-05	1.01E-06		1.22E-05	12.20 pot. res.
6.79E-07	1.05E-05	1.00E-06		1.22E-05	12.18 pot. res.
6.78E-07	1.05E-05	1.00E-06		1.22E-05	12.16 pot. res.
6.82E-07	1.05E-05	1.01E-06		1.22E-05	12.22 pot. res.
6.77E-07	1.05E-05	1.00E-06		1.22E-05	12.15 pot. res.
6.76E-07	1.05E-05	1.00E-06		1.21E-05	12.13 pot. res.
6.57E-07	1.02E-05	9.73E-07		1.18E-05	11.79 pot. res.
6.45E-07	9.98E-06	9.55E-07		1.16E-05	11.58 pot. res.
6.28E-07	9.71E-06	9.29E-07		1.13E-05	11.27 pot. res.
6.22E-07	9.61E-06	9.20E-07		1.12E-05	11.16 pot. res.
6.16E-07	9.52E-06	9.11E-07		1.10E-05	11.04 pot. res.
5.98E-07	9.24E-06	8.85E-07		1.07E-05	10.72 pot. res.
5.95E-07	9.20E-06	8.81E-07		1.07E-05	10.68 pot. res.
5.72E-07	8.84E-06	8.46E-07		1.03E-05	10.25 pot. res.
5.72E-07	8.84E-06	8.46E-07		1.03E-05	10.25 pot. res.
5.70E-07	8.82E-06	8.44E-07		1.02E-05	10.23 pot. res.
5.66E-07	8.75E-06	8.37E-07		1.02E-05	10.15 pot. res.
5.66E-07	8.75E-06	8.37E-07		1.02E-05	10.16 pot. res.
5.64E-07	8.71E-06	8.34E-07		1.01E-05	10.11 pot. res.
5.59E-07	8.64E-06	8.27E-07		1.00E-05	10.03 pot. res.
5.58E-07	8.63E-06	8.26E-07		1.00E-05	10.01 pot. res.
5.58E-07	8.63E-06	8.26E-07		1.00E-05	10.02 pot. res.
5.57E-07	8.62E-06	8.25E-07		1.00E-05	10.00 pot. res.

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Unmitigated New Hospital Construction Cancer Risk Calculations for Residential Child Receptor

Haul Truck Trip Adjustment Factor to Model

	One Way (miles)					
	ISA	RAB	HDMC	IAH1	IAH2	
CalEEMod, Haul	20	20	20	20	20	*haul truck trip distance as modeled in CalEEMod*
CalEEMod, Vend	7.3	7.3	7.3	7.3	7.3	*vendor trip distance as modeled in CalEEMod*
AERMOD	0.52	0.52	0.52	0.52	0.19	
% in Dispersion Model, Haul	3%	3%	3%	3%	1%	
% in Dispersion Model, Vend	7%	7%	7%	7%	3%	

Construction Emissions, *as applied to AERMOD results*

				Days				Total Umitigated DPM (tons)				Total Umitigated DPM (g/s)			
	Year	Start Date	Stop Date	3rd Trimester	0<2	2<9	Duration	Offroad	Haul/Vend1	Haul/Vend2	Idle	Offroad	Haul1	Haul2	Idle
New Hospital	2023	6/1/2023	12/31/2023	90.00	124.00	0.00	214					2.52E-03	0.00E+00	--	0.00E+00
	2024	1/1/2024	12/31/2024	0.00	366.00	0.00	366					3.94E-03	2.72E-06	--	2.55E-06
	2025	1/1/2025	12/31/2025	0.00	240.00	125.00	365					1.76E-03	5.00E-06	--	0.00E+00
	2026	1/1/2026	12/31/2026	0.00	0.00	365.00	365					3.53E-03	9.55E-06	--	0.00E+00
	2027	1/1/2027	12/31/2027	0.00	0.00	365.00	365					1.76E-03	4.57E-06	--	0.00E+00
	2028	1/1/2028	12/31/2028	0.00	0.00	366.00	366					1.95E-03	4.35E-06	--	0.00E+00
	2029	1/1/2029	12/31/2029	0.00	0.00	365.00	365					1.96E-03	4.20E-06	--	0.00E+00

Risk Factors

	Abbreviation	UOM	3rd Trimester	0<2	2<9
Daily Breathing Rate (95th %'ile)	DBR	L/kg-day	361	1090	631
Fraction Of Time At Home	FAH	unitless	1	1	1
Exposure Frequency	EF	days/year	0.96	0.96	0.96
Age Sensitivity Factor	ASF	unitless	10	10	3
Inhalation Absorption Factor	A	unitless	1	1	1
Conversion Factor	CF_1	m^3/L	0.001	0.001	0.001
Conversion Factor	CF_2	$\mu g/m^3$	0.001	0.001	0.001
Cancer Potency Factor (diesel exhaust)	CPF	$mg/kg\text{-}day^{-1}$	1.1	1.1	1.1
Averaging Time (for residential exposure)	AT	years	70.00	70.00	70.00

Intake Factor for Inhalation, IF (m^3/kg-day)

	Year	Equation	3rd Trimester	0<2	2<9
New Hospital	2023		0.012	0.051	0.000
	2024		0.000	0.150	0.000
	2025	DBR*FAH*EF	0.000	0.098	0.009
	2026	*ED*ASF*A*	0.000	0.000	0.026
	2027	CF/AT	0.000	0.000	0.026
	2028		0.000	0.000	0.026
	2029		0.000	0.000	0.026

Risk Calculation Part 1, R1

	3rd Trimester	0<2	2<9
	1.34E-05	5.58E-05	0.00E+00
	0.00E+00	1.65E-04	0.00E+00
	0.00E+00	1.08E-04	9.78E-06
IF*CPF*CF	0.00E+00	0.00E+00	2.86E-05
	0.00E+00	0.00E+00	2.86E-05
	0.00E+00	0.00E+00	2.86E-05
	0.00E+00	0.00E+00	2.86E-05

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

		HDMC						
X (UTM)	Y (UTM	2023	2024	2025	2026	2027	2028	2029
547980	4179760	0.131	0.204	0.091	0.183	0.091	0.101	0.101
547980	4179720	0.112	0.175	0.078	0.157	0.078	0.086	0.087
547980	4179700	0.111	0.173	0.077	0.155	0.077	0.085	0.086
548000	4179760	0.107	0.167	0.075	0.150	0.075	0.082	0.083
547980	4179740	0.106	0.165	0.074	0.148	0.074	0.081	0.082
547980	4179780	0.103	0.161	0.072	0.144	0.072	0.079	0.080
547980	4179680	0.101	0.158	0.071	0.141	0.071	0.078	0.078
548000	4179700	0.097	0.152	0.068	0.135	0.068	0.075	0.075
548000	4179720	0.096	0.150	0.067	0.134	0.067	0.074	0.074
548000	4179740	0.092	0.144	0.064	0.129	0.064	0.071	0.071
548000	4179680	0.089	0.140	0.063	0.125	0.063	0.069	0.069
548020	4179760	0.089	0.139	0.062	0.124	0.062	0.069	0.069
548000	4179780	0.087	0.137	0.061	0.122	0.061	0.067	0.068
548040	4179720	0.086	0.134	0.060	0.120	0.060	0.066	0.066
547940	4179800	0.085	0.133	0.060	0.119	0.060	0.066	0.066
548020	4179720	0.084	0.131	0.059	0.117	0.059	0.065	0.065
547960	4179800	0.083	0.130	0.058	0.116	0.058	0.064	0.065
548020	4179700	0.083	0.130	0.058	0.116	0.058	0.064	0.064
548040	4179740	0.082	0.129	0.058	0.115	0.058	0.064	0.064
547860	4179780	0.082	0.129	0.058	0.115	0.058	0.064	0.064
548020	4179740	0.082	0.128	0.057	0.114	0.057	0.063	0.063
548040	4179700	0.081	0.127	0.057	0.114	0.057	0.063	0.063
547980	4179660	0.081	0.127	0.057	0.114	0.057	0.063	0.063
548060	4179720	0.079	0.124	0.056	0.111	0.056	0.061	0.062
548060	4179700	0.079	0.124	0.055	0.111	0.055	0.061	0.061
548020	4179680	0.077	0.121	0.054	0.108	0.054	0.060	0.060
547980	4179800	0.077	0.120	0.054	0.107	0.054	0.059	0.059
548040	4179760	0.075	0.117	0.052	0.105	0.052	0.058	0.058
548000	4179660	0.075	0.117	0.052	0.105	0.052	0.058	0.058
548020	4179780	0.074	0.116	0.052	0.104	0.052	0.057	0.057
548040	4179680	0.071	0.112	0.050	0.100	0.050	0.055	0.055
548060	4179680	0.071	0.112	0.050	0.100	0.050	0.055	0.055
548080	4179700	0.070	0.110	0.049	0.098	0.049	0.054	0.054
548060	4179740	0.070	0.109	0.049	0.098	0.049	0.054	0.054
548000	4179800	0.068	0.107	0.048	0.096	0.048	0.053	0.053
548080	4179680	0.068	0.106	0.047	0.095	0.047	0.052	0.052
548020	4179660	0.067	0.104	0.047	0.093	0.047	0.051	0.052
548040	4179780	0.063	0.099	0.044	0.089	0.044	0.049	0.049
548060	4179760	0.063	0.099	0.044	0.088	0.044	0.049	0.049
548080	4179720	0.062	0.098	0.044	0.087	0.044	0.048	0.048
548040	4179660	0.062	0.097	0.044	0.087	0.044	0.048	0.048
548020	4179800	0.060	0.094	0.042	0.084	0.042	0.046	0.047
548060	4179660	0.060	0.093	0.042	0.083	0.042	0.046	0.046
548100	4179680	0.059	0.093	0.042	0.083	0.042	0.046	0.046
548080	4179660	0.059	0.093	0.042	0.083	0.042	0.046	0.046
548080	4179740	0.059	0.092	0.041	0.082	0.041	0.045	0.046
547980	4179640	0.058	0.091	0.040	0.081	0.040	0.045	0.045
547960	4179820	0.057	0.089	0.040	0.080	0.040	0.044	0.044
547940	4179820	0.056	0.087	0.039	0.078	0.039	0.043	0.043
548000	4179640	0.056	0.087	0.039	0.078	0.039	0.043	0.043
547980	4179820	0.055	0.086	0.039	0.077	0.039	0.043	0.043
548060	4179780	0.055	0.085	0.038	0.076	0.038	0.042	0.042
548100	4179700	0.054	0.085	0.038	0.076	0.038	0.042	0.042
548080	4179760	0.054	0.084	0.038	0.075	0.038	0.042	0.042
548100	4179660	0.054	0.084	0.038	0.075	0.038	0.041	0.042
548100	4179720	0.053	0.083	0.037	0.074	0.037	0.041	0.041
548040	4179800	0.053	0.083	0.037	0.074	0.037	0.041	0.041
548000	4179820	0.052	0.081	0.036	0.072	0.036	0.040	0.040
548020	4179640	0.052	0.081	0.036	0.072	0.036	0.040	0.040
547920	4179820	0.052	0.081	0.036	0.072	0.036	0.040	0.040

Risk Calculation Part 2

	$\sum R1*C_{DPM}$				Cancer Risk	Receptor
	3rd Trimester	0<2	2<9	Total	per million	Determination
	1.75E-06	5.08E-05	1.45E-05	6.71E-05	67.06	pot. res.
	1.50E-06	4.36E-05	1.24E-05	5.75E-05	57.54	pot. res.
	1.49E-06	4.31E-05	1.23E-05	5.69E-05	56.87	pot. res.
	1.43E-06	4.16E-05	1.19E-05	5.49E-05	54.90	pot. res.
	1.42E-06	4.11E-05	1.17E-05	5.42E-05	54.22	pot. res.
	1.38E-06	4.00E-05	1.14E-05	5.28E-05	52.85	pot. res.
	1.36E-06	3.93E-05	1.12E-05	5.19E-05	51.90	pot. res.
	1.30E-06	3.77E-05	1.07E-05	4.97E-05	49.73	pot. res.
	1.29E-06	3.73E-05	1.06E-05	4.92E-05	49.20	pot. res.
	1.23E-06	3.58E-05	1.02E-05	4.72E-05	47.23	pot. res.
	1.20E-06	3.48E-05	9.93E-06	4.59E-05	45.93	pot. res.
	1.19E-06	3.46E-05	9.87E-06	4.57E-05	45.68	pot. res.
	1.17E-06	3.39E-05	9.68E-06	4.48E-05	44.80	pot. res.
	1.15E-06	3.33E-05	9.50E-06	4.39E-05	43.94	pot. res.
	1.14E-06	3.31E-05	9.45E-06	4.37E-05	43.70	pot. res.
	1.12E-06	3.26E-05	9.29E-06	4.30E-05	42.99	pot. res.
	1.11E-06	3.23E-05	9.23E-06	4.27E-05	42.69	pot. res.
	1.11E-06	3.23E-05	9.22E-06	4.27E-05	42.67	pot. res.
	1.10E-06	3.21E-05	9.15E-06	4.23E-05	42.31	pot. res.
	1.10E-06	3.20E-05	9.14E-06	4.23E-05	42.27	pot. res.
	1.09E-06	3.17E-05	9.05E-06	4.19E-05	41.88	pot. res.
	1.09E-06	3.16E-05	9.02E-06	4.17E-05	41.73	pot. res.
	1.09E-06	3.16E-05	9.02E-06	4.17E-05	41.72	pot. res.
	1.07E-06	3.09E-05	8.82E-06	4.08E-05	40.80	pot. res.
	1.06E-06	3.08E-05	8.78E-06	4.06E-05	40.59	pot. res.
	1.03E-06	3.00E-05	8.56E-06	3.96E-05	39.62	pot. res.
	1.03E-06	2.98E-05	8.50E-06	3.93E-05	39.33	pot. res.
	1.00E-06	2.91E-05	8.31E-06	3.84E-05	38.43	pot. res.
	1.00E-06	2.91E-05	8.30E-06	3.84E-05	38.38	pot. res.
	9.93E-07	2.88E-05	8.22E-06	3.80E-05	38.01	pot. res.
	9.59E-07	2.78E-05	7.94E-06	3.67E-05	36.71	pot. res.
	9.56E-07	2.77E-05	7.92E-06	3.66E-05	36.62	pot. res.
	9.41E-07	2.73E-05	7.79E-06	3.60E-05	36.04	pot. res.
	9.36E-07	2.72E-05	7.75E-06	3.59E-05	35.85	pot. res.
	9.17E-07	2.66E-05	7.59E-06	3.51E-05	35.11	pot. res.
	9.06E-07	2.63E-05	7.50E-06	3.47E-05	34.70	pot. res.
	8.94E-07	2.59E-05	7.40E-06	3.42E-05	34.25	pot. res.
	8.49E-07	2.46E-05	7.03E-06	3.25E-05	32.52	pot. res.
	8.45E-07	2.45E-05	7.00E-06	3.24E-05	32.37	pot. res.
	8.37E-07	2.43E-05	6.93E-06	3.21E-05	32.05	pot. res.
	8.35E-07	2.42E-05	6.91E-06	3.20E-05	31.97	pot. res.
	8.07E-07	2.34E-05	6.68E-06	3.09E-05	30.91	pot. res.
	8.00E-07	2.32E-05	6.63E-06	3.06E-05	30.65	pot. res.
	7.97E-07	2.31E-05	6.60E-06	3.05E-05	30.53	pot. res.
	7.97E-07	2.31E-05	6.60E-06	3.05E-05	30.53	pot. res.
	7.89E-07	2.29E-05	6.53E-06	3.02E-05	30.22	pot. res.
	7.76E-07	2.25E-05	6.42E-06	2.97E-05	29.71	pot. res.
	7.65E-07	2.22E-05	6.33E-06	2.93E-05	29.30	pot. res.
	7.50E-07	2.18E-05	6.21E-06	2.87E-05	28.71	pot. res.
	7.45E-07	2.16E-05	6.17E-06	2.85E-05	28.53	pot. res.
	7.39E-07	2.14E-05	6.12E-06	2.83E-05	28.30	pot. res.
	7.31E-07	2.12E-05	6.05E-06	2.80E-05	28.01	pot. res.
	7.28E-07	2.11E-05	6.03E-06	2.79E-05	27.89	pot. res.
	7.23E-07	2.10E-05	5.98E-06	2.77E-05	27.67	pot. res.
	7.20E-07	2.09E-05	5.96E-06	2.76E-05	27.59	pot. res.
	7.11E-07	2.06E-05	5.89E-06	2.72E-05	27.23	pot. res.
	7.09E-07	2.06E-05	5.87E-06	2.71E-05	27.14	pot. res.
	6.93E-07	2.01E-05	5.74E-06	2.66E-05	26.55	pot. res.
	6.92E-07	2.01E-05	5.73E-06	2.65E-05	26.48	pot. res.
	6.91E-07	2.01E-05	5.72E-06	2.65E-05	26.47	pot. res.

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Unmitigated Initial Phase of Aldea Housing Densification Construction Cancer Risk Calculations for Residential Child Receptor

Haul Truck Trip Adjustment Factor to Model

	One Way (miles)				
	ISA	RAB	HDMC	IAH1	IAH2
CalEEMod, Haul	20	20	20	20	20
CalEEMod, Vend	7.3	7.3	7.3	7.3	7.3
AERMOD	0.52	0.52	0.52	0.52	0.19
% in Dispersion Model, Haul	3%	3%	3%	3%	1%
% in Dispersion Model, Vend	7%	7%	7%	7%	3%

haul truck trip distance as modeled in CalEEMod

vendor trip distance as modeled in CalEEMod

Construction Emissions, *as applied to AERMOD results*

			Days				Total Umitigated DPM (tons)				Total Umitigated DPM (g/s)			
	Year	Start Date Stop Date	3rd Trimester	0<2	2<9	Duration	Offroad	Haul/Vend1	Haul/Vend2	Idle	Offroad	Haul1	Haul2	Idle
Initial phase of Aldea Housing Densification	2028	1/3/2028 12/31/2028	90.00	274.00	0.00	364	6.10E-02	1.96E-05	7.17E-06	2.89E-06	1.76E-03	5.67E-07	2.07E-07	8.35E-08
	2029	1/1/2029 1/11/2029	0.00	11.00	0.00	11	2.30E-04	0.00E+00	0.00E+00	0.00E+00	2.20E-04	0.00E+00	0.00E+00	0.00E+00

Risk Factors

	Abbreviation	UOM	3rd Trimester	0<2	2<9
Daily Breathing Rate (95th %'ile)	DBR	L/kg-day	361	1090	631
Fraction Of Time At Home	FAH	unitless	1	1	1
Exposure Frequency	EF	days/year	0.96	0.96	0.96
Age Sensitivity Factor	ASF	unitless	10	10	3
Inhalation Absorption Factor	A	unitless	1	1	1
Conversion Factor	CF_1	m^3/L	0.001	0.001	0.001
Conversion Factor	CF_2	$\mu g/m^3$	0.001	0.001	0.001
Cancer Potency Factor (diesel exhaust)	CPF	$mg/kg\text{-}day^{-1}$	1.1	1.1	1.1
Averaging Time (for residential exposure)	AT	years	70.00	70.00	70.00

Intake Factor for Inhalation, IF (m^3/kg-day)

	Year	Equation	3rd Trimester	0<2	2<9
Initial phase of Aldea Housing Densification	2028	DBR*FAH*EF *ED*ASF*A* CF/AT	0.012	0.112	0.000
	2029		0.000	0.004	0.000

Risk Calculation Part 1, R1

	3rd Trimester	0<2	2<9
IF*CPF*CF	1.34E-05	1.23E-04	0.00E+00
	0.00E+00	4.95E-06	0.00E+00

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

		IAH	
X (UTM)	Y (UTM	2028	2029
547980	4179080	0.443	0.055
547980	4179100	0.443	0.055
548000	4179040	0.312	0.039
548000	4179100	0.310	0.039
548000	4179060	0.310	0.039
548000	4179080	0.299	0.037
548000	4179120	0.294	0.037
548000	4179020	0.260	0.032
548000	4179140	0.204	0.025
548020	4179080	0.201	0.025
548020	4179060	0.200	0.025
548020	4179100	0.199	0.025
548020	4179040	0.190	0.024
548020	4179120	0.186	0.023
548020	4179020	0.160	0.020
548040	4179080	0.140	0.017
548040	4179060	0.139	0.017
548020	4179140	0.137	0.017
548040	4179100	0.136	0.017
548040	4179040	0.129	0.016
548040	4179120	0.123	0.015
548020	4179000	0.118	0.015
548040	4179020	0.111	0.014
548060	4179080	0.104	0.013
548060	4179060	0.100	0.012
548060	4179100	0.099	0.012
548000	4179160	0.096	0.012
548040	4179140	0.095	0.012
548060	4179040	0.095	0.012
548060	4179120	0.092	0.011
547980	4179160	0.088	0.011
548040	4179000	0.088	0.011
548020	4179160	0.086	0.011
548060	4179020	0.084	0.010
548080	4179080	0.078	0.010
548080	4179060	0.077	0.010
548060	4179140	0.075	0.009
548080	4179040	0.074	0.009
548080	4179100	0.074	0.009
548040	4179160	0.071	0.009
548080	4179120	0.069	0.009
548100	4179080	0.062	0.008
548080	4179140	0.059	0.007
548100	4179100	0.059	0.007
548060	4179160	0.058	0.007
548100	4179120	0.054	0.007
548020	4179180	0.052	0.007
548000	4179180	0.051	0.006
548040	4179180	0.050	0.006
548080	4179160	0.049	0.006
548100	4179140	0.049	0.006
548120	4179100	0.049	0.006
548120	4179120	0.045	0.006
548060	4179180	0.045	0.006
548100	4179160	0.042	0.005
548120	4179140	0.040	0.005
548080	4179180	0.038	0.005
548140	4179120	0.038	0.005
548100	4179180	0.035	0.004
548120	4179160	0.034	0.004
548140	4179140	0.034	0.004
548160	4179120	0.032	0.004
548140	4179160	0.030	0.004
548080	4179200	0.030	0.004
548120	4179180	0.030	0.004
548160	4179140	0.029	0.004
548100	4179200	0.028	0.003
548160	4179160	0.026	0.003
548140	4179180	0.026	0.003
548180	4179140	0.026	0.003
548120	4179200	0.025	0.003

Risk Calculation Part 2

	$\sum R1*C_{DPM}$				Cancer Risk	
	3rd Trimester	0<2	2<9	Total	per million	Receptor Determination
	5.94E-06	5.49E-05	0.00E+00	6.08E-05	60.81	Aldea Housing Res Hall
	5.94E-06	5.49E-05	0.00E+00	6.08E-05	60.80	Aldea Housing Res Hall
	4.18E-06	3.86E-05	0.00E+00	4.28E-05	42.81	Aldea Housing Res Hall
	4.16E-06	3.84E-05	0.00E+00	4.26E-05	42.55	Aldea Housing Res Hall
	4.15E-06	3.84E-05	0.00E+00	4.25E-05	42.54	Aldea Housing Res Hall
	4.01E-06	3.70E-05	0.00E+00	4.11E-05	41.05	Aldea Housing Res Hall
	3.94E-06	3.64E-05	0.00E+00	4.04E-05	40.37	Aldea Housing Res Hall
	3.49E-06	3.23E-05	0.00E+00	3.58E-05	35.75	Aldea Housing Res Hall
	2.74E-06	2.53E-05	0.00E+00	2.81E-05	28.05	Aldea Housing Res Hall
	2.69E-06	2.49E-05	0.00E+00	2.75E-05	27.55	Aldea Housing Res Hall
	2.68E-06	2.48E-05	0.00E+00	2.74E-05	27.45	Aldea Housing Res Hall
	2.67E-06	2.46E-05	0.00E+00	2.73E-05	27.29	Aldea Housing Res Hall
	2.55E-06	2.35E-05	0.00E+00	2.61E-05	26.07	Aldea Housing Res Hall
	2.49E-06	2.30E-05	0.00E+00	2.55E-05	25.50	Aldea Housing Res Hall
	2.15E-06	1.98E-05	0.00E+00	2.20E-05	21.98	Aldea Housing Res Hall
	1.87E-06	1.73E-05	0.00E+00	1.92E-05	19.17	Aldea Housing Res Hall
	1.86E-06	1.72E-05	0.00E+00	1.91E-05	19.07	Aldea Housing Res Hall
	1.84E-06	1.70E-05	0.00E+00	1.88E-05	18.82	Aldea Housing Res Hall
	1.83E-06	1.69E-05	0.00E+00	1.87E-05	18.73	Aldea Housing Res Hall
	1.73E-06	1.60E-05	0.00E+00	1.77E-05	17.70	Aldea Housing Res Hall
	1.65E-06	1.52E-05	0.00E+00	1.69E-05	16.85	Aldea Housing Res Hall
	1.58E-06	1.46E-05	0.00E+00	1.61E-05	16.15	Aldea Housing Res Hall
	1.49E-06	1.37E-05	0.00E+00	1.52E-05	15.24	Aldea Housing Res Hall
	1.39E-06	1.28E-05	0.00E+00	1.42E-05	14.23	Aldea Housing Res Hall
	1.34E-06	1.24E-05	0.00E+00	1.37E-05	13.71	Aldea Housing Res Hall
	1.33E-06	1.23E-05	0.00E+00	1.36E-05	13.65	Aldea Housing Res Hall
	1.29E-06	1.19E-05	0.00E+00	1.32E-05	13.20	Aldea Housing Res Hall
	1.28E-06	1.18E-05	0.00E+00	1.31E-05	13.07	Aldea Housing Res Hall
	1.27E-06	1.18E-05	0.00E+00	1.30E-05	13.03	Aldea Housing Res Hall
	1.23E-06	1.14E-05	0.00E+00	1.26E-05	12.61	Aldea Housing Res Hall
	1.19E-06	1.10E-05	0.00E+00	1.21E-05	12.14	Aldea Housing Res Hall
	1.18E-06	1.09E-05	0.00E+00	1.21E-05	12.07	Aldea Housing Res Hall
	1.16E-06	1.07E-05	0.00E+00	1.19E-05	11.87	Aldea Housing Res Hall
	1.13E-06	1.04E-05	0.00E+00	1.16E-05	11.55	Aldea Housing Res Hall
	1.04E-06	9.64E-06	0.00E+00	1.07E-05	10.68	Aldea Housing Res Hall
	1.04E-06	9.60E-06	0.00E+00	1.06E-05	10.64	Aldea Housing Res Hall
	1.01E-06	9.31E-06	0.00E+00	1.03E-05	10.31	Aldea Housing Res Hall
	9.93E-07	9.17E-06	0.00E+00	1.02E-05	10.16	Aldea Housing Res Hall
	9.92E-07	9.16E-06	0.00E+00	1.02E-05	10.16	Aldea Housing Res Hall
	9.53E-07	8.80E-06	0.00E+00	9.76E-06	9.76	Aldea Housing Res Hall
	9.26E-07	8.55E-06	0.00E+00	9.48E-06	9.48	Aldea Housing Res Hall
	8.30E-07	7.67E-06	0.00E+00	8.50E-06	8.50	Aldea Housing Res Hall
	7.98E-07	7.37E-06	0.00E+00	8.17E-06	8.17	Aldea Housing Res Hall
	7.88E-07	7.28E-06	0.00E+00	8.07E-06	8.07	Aldea Housing Res Hall
	7.80E-07	7.20E-06	0.00E+00	7.98E-06	7.98	Aldea Housing Res Hall
	7.27E-07	6.71E-06	0.00E+00	7.44E-06	7.44	Aldea Housing Res Hall
	7.02E-07	6.48E-06	0.00E+00	7.18E-06	7.18	Aldea Housing Res Hall
	6.88E-07	6.36E-06	0.00E+00	7.05E-06	7.05	Aldea Housing Res Hall
	6.65E-07	6.15E-06	0.00E+00	6.81E-06	6.81	Aldea Housing Res Hall
	6.59E-07	6.09E-06	0.00E+00	6.75E-06	6.75	Aldea Housing Res Hall
	6.57E-07	6.07E-06	0.00E+00	6.73E-06	6.73	Aldea Housing Res Hall
	6.52E-07	6.02E-06	0.00E+00	6.68E-06	6.68	Aldea Housing Res Hall
	6.08E-07	5.61E-06	0.00E+00	6.22E-06	6.22	Aldea Housing Res Hall
	6.01E-07	5.55E-06	0.00E+00	6.15E-06	6.15	Aldea Housing Res Hall
	5.61E-07	5.19E-06	0.00E+00	5.75E-06	5.75	Aldea Housing Res Hall
	5.41E-07	5.00E-06	0.00E+00	5.54E-06	5.54	Aldea Housing Res Hall
	5.14E-07	4.75E-06	0.00E+00	5.26E-06	5.26	Aldea Housing Res Hall
	5.03E-07	4.65E-06	0.00E+00	5.15E-06	5.15	Aldea Housing Res Hall
	4.64E-07	4.29E-06	0.00E+00	4.75E-06	4.75	Aldea Housing Res Hall
	4.63E-07	4.27E-06	0.00E+00	4.74E-06	4.74	Aldea Housing Res Hall
	4.55E-07	4.21E-06	0.00E+00	4.66E-06	4.66	Aldea Housing Res Hall
	4.30E-07	3.97E-06	0.00E+00	4.40E-06	4.40	Aldea Housing Res Hall
	4.02E-07	3.71E-06	0.00E+00	4.11E-06	4.11	Aldea Housing Res Hall
	4.00E-07	3.69E-06	0.00E+00	4.09E-06	4.09	Aldea Housing Res Hall
	3.96E-07	3.66E-06	0.00E+00	4.05E-06	4.05	Aldea Housing Res Hall
	3.91E-07	3.61E-06	0.00E+00	4.00E-06	4.00	Aldea Housing Res Hall
	3.70E-07	3.42E-06	0.00E+00	3.79E-06	3.79	Aldea Housing Res Hall
	3.52E-07	3.25E-06	0.00E+00	3.60E-06	3.60	Aldea Housing Res Hall
	3.48E-07	3.21E-06	0.00E+00	3.56E-06	3.56	Aldea Housing Res Hall
	3.46E-07	3.19E-06	0.00E+00	3.54E-06	3.54	Aldea Housing Res Hall
	3.34E-07	3.09E-06	0.00E+00	3.42E-06	3.42	Aldea Housing Res Hall

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Unmitigated Construction Hazard Index Calculations for Residential Child Receptor

Haul Truck Trip Adjustment Factor to Model

	One Way (miles)				
	ISA	RAB	HDMC	IAH1	IAH2
CalEEMod, Haul	20	20	20	20	20
CalEEMod, Vend	7.3	7.3	7.3	7.3	7.3
AERMOD	0.52	0.52	0.52	0.52	0.19
% in Dispersion Model, Haul	3%	3%	3%	3%	1%
% in Dispersion Model, Vend	7%	7%	7%	7%	3%

haul truck trip distance as modeled in CalEEMod

vendor trip distance as modeled in CalEEMod

HI DPM: 5

Construction Emissions, *as applied to AERMOD results*

				Total Unmitigated DPM (tons)				Total Unmitigated DPM (g/s)			
	Year	Start Date	Stop Date	Offroad	Haul/Vend1	Haul/Vend2	Idle	Offroad	Haul1	Haul2	Idle
Irving Street Arrival	2022	3/1/2022	12/31/2022	4.56E-02	5.74E-06	--	1.77E-06	1.31E-03	1.65E-07	--	5.09E-08
	2023	1/1/2023	11/30/2023	3.85E-02	4.29E-06	--	0.00E+00	1.11E-03	1.24E-07	--	0.00E+00
Research and Academic Building	2022	3/1/2022	12/31/2022	1.36E-01	1.08E-04	--	6.40E-05	3.92E-03	3.10E-06	--	1.84E-06
	2023	1/1/2023	12/31/2023	7.97E-02	5.30E-05	--	0.00E+00	2.29E-03	1.52E-06	--	0.00E+00
	2024	1/1/2024	12/31/2024	7.85E-02	5.08E-05	--	0.00E+00	2.26E-03	1.46E-06	--	0.00E+00
	2025	1/1/2025	12/31/2025	6.80E-02	4.87E-05	--	0.00E+00	1.96E-03	1.40E-06	--	0.00E+00
New Hospital	2023	6/1/2023	12/31/2023	5.14E-02	0.00E+00	--	0.00E+00	1.48E-03	0.00E+00	--	0.00E+00
	2024	1/1/2024	12/31/2024	1.38E-01	9.48E-05	--	8.89E-05	3.96E-03	2.73E-06	--	2.56E-06
	2025	1/1/2025	12/31/2025	6.13E-02	1.74E-04	--	0.00E+00	1.76E-03	5.00E-06	--	0.00E+00
	2026	1/1/2026	12/31/2026	1.23E-01	3.32E-04	--	0.00E+00	3.53E-03	9.55E-06	--	0.00E+00
	2027	1/1/2027	12/31/2027	6.13E-02	1.59E-04	--	0.00E+00	1.76E-03	4.57E-06	--	0.00E+00
	2028	1/1/2028	12/31/2028	6.78E-02	1.52E-04	--	0.00E+00	1.95E-03	4.36E-06	--	0.00E+00
	2029	1/1/2029	12/31/2029	6.80E-02	1.46E-04	--	0.00E+00	1.96E-03	4.20E-06	--	0.00E+00
Initial phase of Aldea Housing Densification	2028	1/3/2028	12/31/2028	6.10E-02	1.96E-05	7.17E-06	2.89E-06	1.76E-03	5.65E-07	2.06E-07	8.33E-08
	2029	1/1/2029	1/11/2029	2.30E-04	0.00E+00	0.00E+00	0.00E+00	6.62E-06	0.00E+00	0.00E+00	0.00E+00

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

By project

		ISA		RAB				HDMC							IAH		ISA	RAB	HDMC	IAH
X (UTM)	Y (UTM	2022	2023	2022	2023	2024	2025	2023	2024	2025	2026	2027	2028	2029	2028	2029				
547560	4179660	0.010	0.008	0.183	0.107	0.105	0.091	0.006	0.017	0.008	0.015	0.008	0.008	0.009	0.001	0.000	0.002	0.037	0.003	0.000
547520	4179640	0.008	0.006	0.176	0.103	0.101	0.088	0.005	0.014	0.006	0.013	0.006	0.007	0.007	0.001	0.000	0.002	0.035	0.003	0.000
547540	4179660	0.009	0.008	0.139	0.081	0.080	0.069	0.005	0.015	0.007	0.013	0.007	0.007	0.007	0.001	0.000	0.002	0.028	0.003	0.000
547500	4179640	0.007	0.006	0.125	0.073	0.072	0.062	0.004	0.012	0.006	0.011	0.006	0.006	0.006	0.001	0.000	0.001	0.025	0.002	0.000
547440	4179580	0.005	0.004	0.104	0.061	0.060	0.052	0.003	0.009	0.004	0.009	0.004	0.005	0.005	0.001	0.000	0.001	0.021	0.002	0.000
547560	4179680	0.011	0.009	0.106	0.062	0.061	0.053	0.006	0.016	0.007	0.015	0.007	0.008	0.008	0.001	0.000	0.002	0.021	0.003	0.000
547520	4179660	0.008	0.007	0.104	0.061	0.060	0.052	0.005	0.013	0.006	0.012	0.006	0.006	0.007	0.001	0.000	0.002	0.021	0.003	0.000
547460	4179620	0.006	0.005	0.100	0.058	0.057	0.050	0.004	0.010	0.005	0.009	0.005	0.005	0.005	0.001	0.000	0.001	0.020	0.002	0.000
547440	4179540	0.004	0.003	0.096	0.056	0.056	0.048	0.003	0.009	0.004	0.008	0.004	0.005	0.005	0.001	0.000	0.001	0.019	0.002	0.000
547480	4179640	0.006	0.005	0.095	0.055	0.055	0.047	0.004	0.011	0.005	0.010	0.005	0.005	0.005	0.001	0.000	0.001	0.019	0.002	0.000
547860	4179780	0.078	0.066	0.031	0.018	0.018	0.016	0.048	0.129	0.058	0.115	0.058	0.064	0.064	0.001	0.000	0.016	0.006	0.026	0.000
547860	4179800	0.078	0.066	0.027	0.016	0.016	0.013	0.029	0.077	0.034	0.069	0.034	0.038	0.038	0.001	0.000	0.016	0.005	0.015	0.000
547980	4179760	0.024	0.020	0.023	0.014	0.013	0.012	0.077	0.205	0.091	0.183	0.091	0.101	0.101	0.001	0.000	0.005	0.005	0.041	0.000
547740	4179820	0.092	0.078	0.022	0.013	0.013	0.011	0.009	0.025	0.011	0.023	0.011	0.012	0.013	0.001	0.000	0.018	0.004	0.005	0.000
547860	4179820	0.070	0.059	0.023	0.014	0.013	0.012	0.019	0.052	0.023	0.046	0.023	0.026	0.026	0.001	0.000	0.014	0.005	0.010	0.000
547980	4179780	0.026	0.022	0.022	0.013	0.013	0.011	0.060	0.162	0.072	0.144	0.072	0.080	0.080	0.001	0.000	0.005	0.004	0.032	0.000
548000	4179760	0.021	0.018	0.022	0.013	0.013	0.011	0.063	0.168	0.075	0.150	0.075	0.083	0.083	0.001	0.000	0.004	0.004	0.034	0.000
547980	4179720	0.018	0.015	0.021	0.012	0.012	0.011	0.066	0.176	0.078	0.157	0.078	0.087	0.087	0.001	0.000	0.004	0.004	0.035	0.000
547980	4179740	0.020	0.017	0.021	0.012	0.012	0.011	0.062	0.166	0.074	0.148	0.074	0.082	0.082	0.001	0.000	0.004	0.004	0.033	0.000
547980	4179700	0.015	0.012	0.022	0.013	0.012	0.011	0.065	0.174	0.077	0.155	0.077	0.086	0.086	0.001	0.000	0.003	0.004	0.035	0.000
547980	4179680	0.012	0.010	0.023	0.013	0.013	0.011	0.059	0.159	0.071	0.141	0.071	0.078	0.078	0.001	0.000	0.002	0.005	0.032	0.000
548000	4179720	0.016	0.014	0.021	0.012	0.012	0.010	0.056	0.150	0.067	0.134	0.067	0.074	0.074	0.001	0.000	0.003	0.004	0.030	0.000
548000	4179700	0.014	0.012	0.022	0.013	0.013	0.011	0.057	0.152	0.068	0.135	0.068	0.075	0.075	0.001	0.000	0.003	0.004	0.030	0.000
548000	4179740	0.018	0.015	0.021	0.012	0.012	0.010	0.054	0.144	0.064	0.129	0.064	0.071	0.071	0.001	0.000	0.004	0.004	0.029	0.000
547860	4179840	0.062	0.052	0.020	0.012	0.011	0.010	0.014	0.037	0.017	0.033	0.017	0.018	0.018	0.001	0.000	0.012	0.004	0.007	0.000
547760	4179840	0.064	0.054	0.019	0.011	0.011	0.010	0.009	0.024	0.011	0.021	0.011	0.012	0.012	0.001	0.000	0.013	0.004	0.005	0.000
547700	4179820	0.049	0.042	0.021	0.012	0.012	0.010	0.007	0.020	0.009	0.018	0.009	0.010	0.010	0.001	0.000	0.010	0.004	0.004	0.000
547840	4179860	0.052	0.044	0.017	0.010	0.010	0.008	0.010	0.026	0.012	0.023	0.012	0.013	0.013	0.001	0.000	0.010	0.003	0.005	0.000
547740	4179840	0.050	0.042	0.019	0.011	0.011	0.009	0.008	0.021	0.010	0.019	0.010	0.011	0.011	0.001	0.000	0.010	0.004	0.004	0.000
547860	4179860	0.048	0.040	0.017	0.010	0.010	0.008	0.010	0.028	0.013	0.025	0.013	0.014	0.014	0.001	0.000	0.010	0.003	0.006	0.000
547980	4179100	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.442	0.002	0.000	0.000	0.000	0.088
547980	4179080	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.442	0.002	0.000	0.000	0.000	0.088
548000	4179100	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.309	0.001	0.000	0.000	0.000	0.062
548000	4179060	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.309	0.001	0.000	0.000	0.000	0.062
548000	4179120	0.000	0.000	0.002	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.293	0.001	0.000	0.000	0.000	0.059
548000	4179040	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.311	0.001	0.000	0.000	0.000	0.062
548000	4179080	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.298	0.001	0.000	0.000	0.000	0.060
548000	4179020	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.260	0.001	0.000	0.000	0.000	0.052
548000	4179140	0.000	0.000	0.002	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.204	0.001	0.000	0.000	0.000	0.041
548020	4179080	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.200	0.001	0.000	0.000	0.000	0.040

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Unmitigated Construction Cancer Risk Calculations for Daycare and School Receptors

Solver was used to maximize the exposure

Haul Truck Trip Adjustment Factor to Model

	One Way (miles)					
	ISA	RAB	HDMC	IAH1	IAH2	
CalEEMod, Haul	20	20	20	20	20	*haul truck trip distance as modeled in CalEEMod*
CalEEMod, Vend	7.3	7.3	7.3	7.3	7.3	*vendor trip distance as modeled in CalEEMod*
AERMOD	0.52	0.52	0.52	0.52	0.19	
% in Dispersion Model, Haul	3%	3%	3%	3%	1%	
% in Dispersion Model, Vend	7%	7%	7%	7%	3%	

Construction Emissions, *as represented in AERMOD*

					Total Umitigated DPM (tons)				Total Umitigated DPM (g/s)			
	Year	Start Date	Stop Date	Duration (Days)	Offroad	Haul/Vend1	Haul/Vend2	Idle	Offroad	Haul1	Haul2	Idle
Irving Street Arrival	2022	3/1/2022	12/31/2022	306	4.56E-02	5.74E-06	--	1.77E-06	1.56E-03	1.97E-07	--	6.07E-08
	2023	1/1/2023	11/30/2023	334	3.85E-02	4.29E-06	--	0.00E+00	1.21E-03	1.35E-07	--	0.00E+00
Research and Academic Building	2022	3/1/2022	12/31/2022	306	1.36E-01	1.08E-04	--	6.40E-05	4.68E-03	3.70E-06	--	2.20E-06
	2023	1/1/2023	12/31/2023	365	7.97E-02	5.30E-05	--	0.00E+00	2.29E-03	1.52E-06	--	0.00E+00
	2024	1/1/2024	12/31/2024	366	7.85E-02	5.08E-05	--	0.00E+00	2.25E-03	1.46E-06	--	0.00E+00
	2025	1/1/2025	12/31/2025	365	6.80E-02	4.87E-05	--	0.00E+00	1.96E-03	1.40E-06	--	0.00E+00
New Hospital	2023	6/1/2023	12/31/2023	214	5.14E-02	0.00E+00	--	0.00E+00	2.52E-03	0.00E+00	--	0.00E+00
	2024	1/1/2024	12/31/2024	366	1.38E-01	9.48E-05	--	8.89E-05	3.94E-03	2.72E-06	--	2.55E-06
	2025	1/1/2025	12/31/2025	365	6.13E-02	1.74E-04	--	0.00E+00	1.76E-03	5.00E-06	--	0.00E+00
	2026	1/1/2026	12/31/2026	365	1.23E-01	3.32E-04	--	0.00E+00	3.53E-03	9.55E-06	--	0.00E+00
	2027	1/1/2027	12/31/2027	365	6.13E-02	1.59E-04	--	0.00E+00	1.76E-03	4.57E-06	--	0.00E+00
	2028	1/1/2028	12/31/2028	366	6.78E-02	1.52E-04	--	0.00E+00	1.95E-03	4.35E-06	--	0.00E+00
	2029	1/1/2029	12/31/2029	365	6.80E-02	1.46E-04	--	0.00E+00	1.96E-03	4.20E-06	--	0.00E+00
Initial phase of Aldea Housing Densification	2028	1/3/2028	12/31/2028	364	6.10E-02	1.96E-05	7.17E-06	2.89E-06	1.76E-03	5.67E-07	2.07E-07	8.35E-08
	2029	1/1/2029	1/11/2029	11	2.30E-04	0.00E+00	0.00E+00	0.00E+00	2.20E-04	0.00E+00	0.00E+00	0.00E+00

		Daycare1		Daycare2		Daycare3		School1	School2	School3	School4
Name		Lucia Child Care Center		ABC Bay Area Child Care		Kirkham Child Care Center		Clarendon Alternative Elementary	Independence High	Stepping Stones Preschool	Haight Ashbury Community Nursery School
Max Exposure (years)		5		5		5		7	5	4	4
Exposure Duration	Year	0<2	2<9	0<2	2<9	0<2	2<9	2<16	2<16	2<16	2<16
Irving Street Arrival	2022	306.00	0.00	306.00	0.00	306.00	0.00	306.00	306.00	306.00	306.00
	2023	334.00	0.00	334.00	0.00	334.00	0.00	334.00	334.00	334.00	334.00
Research and Academic Building	2022	306.00	0.00	306.00	0.00	306.00	0.00	306.00	306.00	306.00	306.00
	2023	365.00	0.00	365.00	0.00	365.00	0.00	365.00	365.00	365.00	365.00
	2024	59.00	307.00	59.00	307.00	59.00	307.00	366.00	366.00	366.00	366.00
	2025	0.00	365.00	0.00	365.00	0.00	365.00	365.00	365.00	365.00	365.00
New Hospital	2023	214.00	0.00	214.00	0.00	214.00	0.00	214.00	214.00	214.00	214.00
	2024	366.00	0.00	366.00	0.00	366.00	0.00	366.00	366.00	366.00	366.00
	2025	180.00	185.00	180.00	185.00	180.00	185.00	365.00	365.00	365.00	365.00
	2026	0.00	365.00	0.00	365.00	0.00	365.00	365.00	365.00	365.00	365.00
	2027	0.00	365.00	0.00	365.00	0.00	365.00	365.00	365.00	151.00	151.00
	2028	0.00	181.00	0.00	181.00	0.00	181.00	366.00	151.00	0.00	0.00
	2029	0.00	0.00	0.00	0.00	0.00	0.00	365.00	0.00	0.00	0.00
Initial phase of Aldea Housing Densification	2028	364.00	0.00	364.00	0.00	364.00	0.00	364.00	364.00	364.00	364.00
	2029	11.00	0.00	11.00	0.00	11.00	0.00	11.00	11.00	11.00	11.00
		730.00	1096.0	730	1096	730	1096	2556.00	1826.00	1461	1461.00

Risk Factors

			Daycare		School
	Abbreviation	UOM	0<2	2<9	2<16
8HR Breathing Rate (95th %'ile, moderate intensity)	BR	L/kg-day	1200	640	520
Fraction Of Time At Home	FAH	unitless	0.33	0.33	0.33
Exposure Frequency	EF	days/year	0.68	0.68	0.49
Age Sensitivity Factor	ASF	unitless	10	3	3
Inhalation Absorption Factor	A	unitless	1	1	1
Modeling Adjustment Factor	MAF	unitless	1.4	1.4	1.4
Conversion Factor	CF_1	m^3/L	0.001	0.001	0.001
Conversion Factor	CF_2	$\mu g/m^3$	0.001	0.001	0.001
Cancer Potency Factor (diesel exhaust)	CPF	$mg/kg\text{-}day^{-1}$	1.1	1.1	1.1
Averaging Time (for residential exposure)	AT	years	70.00	70.00	70.00

Intake Factor for Inhalation, IF (m^3/kg-day)

			Daycare1		Daycare2		Daycare3		School1	School2	School3	School4
	Year	Equation	0<2	2<9	0<2	2<9	0<2	2<9	2<16	2<16	2<16	2<16
Irving Street Arrival	2022		0.045	0.000	0.045	0.000	0.045	0.000	0.004	0.004	0.004	0.004
	2023		0.050	0.000	0.050	0.000	0.050	0.000	0.005	0.005	0.005	0.005
Research and Academic Building	2022		0.045	0.000	0.045	0.000	0.045	0.000	0.004	0.004	0.004	0.004
	2023		0.054	0.000	0.054	0.000	0.054	0.000	0.005	0.005	0.005	0.005
	2024		0.009	0.007	0.009	0.007	0.009	0.007	0.005	0.005	0.005	0.005
	2025		0.000	0.009	0.000	0.009	0.000	0.009	0.005	0.005	0.005	0.005
New Hospital	2023	BR*FAH*EF*	0.032	0.000	0.032	0.000	0.032	0.000	0.003	0.003	0.003	0.003
	2024	ED*ASF*A*	0.054	0.000	0.054	0.000	0.054	0.000	0.005	0.005	0.005	0.005
	2025	MAF*CF/AT	0.027	0.004	0.027	0.004	0.027	0.004	0.005	0.005	0.005	0.005
	2026		0.000	0.009	0.000	0.009	0.000	0.009	0.005	0.005	0.005	0.005
	2027		0.000	0.009	0.000	0.009	0.000	0.009	0.005	0.005	0.002	0.002
	2028		0.000	0.004	0.000	0.004	0.000	0.004	0.005	0.002	0.000	0.000
	2029		0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000
Initial phase of Aldea Housing Densification	2028		0.054	0.000	0.054	0.000	0.054	0.000	0.005	0.005	0.005	0.005

	2029		0.002	0.000	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000

Risk Calculation Part 1, R1

			Daycare1		Daycare2		Daycare3		School1	School2	School3	School4
	Year	Equation	0<2	2<9	0<2	2<9	0<2	2<9	2<16	2<16	2<16	2<16
Irving Street Arrival	2022		5.00E-05	0.00E+00	5.00E-05	0.00E+00	5.00E-05	0.00E+00	4.68E-06	4.68E-06	4.68E-06	4.68E-06
	2023		5.46E-05	0.00E+00	5.46E-05	0.00E+00	5.46E-05	0.00E+00	5.11E-06	5.11E-06	5.11E-06	5.11E-06
Research and Academic Building	2022		5.00E-05	0.00E+00	5.00E-05	0.00E+00	5.00E-05	0.00E+00	4.68E-06	4.68E-06	4.68E-06	4.68E-06
	2023		5.97E-05	0.00E+00	5.97E-05	0.00E+00	5.97E-05	0.00E+00	5.59E-06	5.59E-06	5.59E-06	5.59E-06
	2024		9.65E-06	8.03E-06	9.65E-06	8.03E-06	9.65E-06	8.03E-06	5.60E-06	5.60E-06	5.60E-06	5.60E-06
	2025		0.00E+00	9.55E-06	0.00E+00	9.55E-06	0.00E+00	9.55E-06	5.59E-06	5.59E-06	5.59E-06	5.59E-06
New Hospital	2023		3.50E-05	0.00E+00	3.50E-05	0.00E+00	3.50E-05	0.00E+00	3.27E-06	3.27E-06	3.27E-06	3.27E-06
	2024	IF*CPF*CF	5.98E-05	0.00E+00	5.98E-05	0.00E+00	5.98E-05	0.00E+00	5.60E-06	5.60E-06	5.60E-06	5.60E-06
	2025		2.94E-05	4.84E-06	2.94E-05	4.84E-06	2.94E-05	4.84E-06	5.59E-06	5.59E-06	5.59E-06	5.59E-06
	2026		0.00E+00	9.55E-06	0.00E+00	9.55E-06	0.00E+00	9.55E-06	5.59E-06	5.59E-06	5.59E-06	5.59E-06
	2027		0.00E+00	9.55E-06	0.00E+00	9.55E-06	0.00E+00	9.55E-06	5.59E-06	5.59E-06	2.31E-06	2.31E-06
	2028		0.00E+00	4.73E-06	0.00E+00	4.73E-06	0.00E+00	4.73E-06	5.60E-06	2.31E-06	0.00E+00	0.00E+00
	2029		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.59E-06	0.00E+00	0.00E+00	0.00E+00
Initial phase of Aldea Housing Densification	2028		5.95E-05	0.00E+00	5.95E-05	0.00E+00	5.95E-05	0.00E+00	5.57E-06	5.57E-06	5.57E-06	5.57E-06
	2029		1.80E-06	0.00E+00	1.80E-06	0.00E+00	1.80E-06	0.00E+00	1.68E-07	1.68E-07	1.68E-07	1.68E-07

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

Risk Calculation Part 2

																R1*ΣC_{DPM}				
																ISA	RAB	HDMC	IAH	
547880	4178580	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.46E-03	8.20E-03	1.38E-02	9.13E-03	Clarendon Alternative Elementary
547900	4178580	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.44E-03	8.02E-03	1.35E-02	9.02E-03	Clarendon Alternative Elementary
547920	4178580	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.43E-03	8.04E-03	1.35E-02	8.94E-03	Clarendon Alternative Elementary
547860	4178600	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.51E-03	8.32E-03	1.40E-02	1.01E-02	Clarendon Alternative Elementary
547880	4178600	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.49E-03	8.15E-03	1.37E-02	9.92E-03	Clarendon Alternative Elementary
547900	4178600	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.46E-03	7.94E-03	1.34E-02	9.79E-03	Clarendon Alternative Elementary
547920	4178600	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.45E-03	7.97E-03	1.34E-02	9.65E-03	Clarendon Alternative Elementary
547880	4178620	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.52E-03	8.24E-03	1.39E-02	1.08E-02	Clarendon Alternative Elementary
547900	4178620	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.50E-03	8.13E-03	1.37E-02	1.06E-02	Clarendon Alternative Elementary
547880	4178640	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.56E-03	8.46E-03	1.43E-02	1.18E-02	Clarendon Alternative Elementary
547900	4178640	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.54E-03	8.36E-03	1.41E-02	1.16E-02	Clarendon Alternative Elementary
547920	4178640	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.52E-03	8.28E-03	1.39E-02	1.14E-02	Clarendon Alternative Elementary
547880	4178660	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.60E-03	8.59E-03	1.45E-02	1.29E-02	Clarendon Alternative Elementary
547900	4178660	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.58E-03	8.43E-03	1.42E-02	1.27E-02	Clarendon Alternative Elementary
547920	4178660	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.55E-03	8.31E-03	1.40E-02	1.25E-02	Clarendon Alternative Elementary
547900	4178680	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.003	0.000	1.62E-03	8.58E-03	1.44E-02	1.41E-02	Clarendon Alternative Elementary
547920	4178680	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.59E-03	8.47E-03	1.42E-02	1.38E-02	Clarendon Alternative Elementary
547940	4178680	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	1.57E-03	8.37E-03	1.40E-02	1.36E-02	Clarendon Alternative Elementary
547220	4179660	0.002	0.002	0.011	0.005	0.005	0.005	0.002	0.004	0.002	0.003	0.002	0.002	0.002	0.001	0.000	2.07E-02	1.37E-01	7.13E-02	2.98E-03	Independence High
547240	4179660	0.003	0.002	0.012	0.006	0.006	0.005	0.003	0.004	0.002	0.004	0.002	0.002	0.002	0.001	0.000	2.22E-02	1.52E-01	7.54E-02	3.06E-03	Independence High
547220	4179680	0.002	0.002	0.010	0.005	0.005	0.004	0.002	0.004	0.002	0.003	0.002	0.002	0.002	0.001	0.000	2.03E-02	1.30E-01	6.92E-02	2.91E-03	Independence High
547240	4179680	0.003	0.002	0.011	0.006	0.005	0.005	0.002	0.004	0.002	0.004	0.002	0.002	0.002	0.001	0.000	2.18E-02	1.42E-01	7.32E-02	2.99E-03	Independence High
547160	4179700	0.002	0.001	0.008	0.004	0.004	0.003	0.002	0.003	0.001	0.003	0.001	0.002	0.002	0.000	0.000	1.62E-02	9.46E-02	4.93E-02	2.64E-03	Stepping Stones Preschool
547180	4179700	0.002	0.002	0.008	0.004	0.004	0.003	0.002	0.003	0.001	0.003	0.001	0.002	0.002	0.000	0.000	1.73E-02	1.02E-01	5.18E-02	2.71E-03	Stepping Stones Preschool
547160	4179720	0.002	0.001	0.007	0.004	0.003	0.003	0.002	0.003	0.001	0.003	0.001	0.001	0.001	0.000	0.000	1.58E-02	8.96E-02	4.78E-02	2.59E-03	Stepping Stones Preschool
547180	4179720	0.002	0.002	0.008	0.004	0.004	0.003	0.002	0.003	0.001	0.003	0.001	0.002	0.002	0.000	0.000	1.69E-02	9.67E-02	5.02E-02	2.65E-03	Stepping Stones Preschool
548260	4179620	0.008	0.006	0.016	0.008	0.007	0.007	0.019	0.030	0.013	0.027	0.013	0.015	0.015	0.001	0.000	7.02E-02	1.94E-01	4.89E-01	7.74E-03	Haight Ashbury Community Nursery School
548280	4179620	0.008	0.006	0.015	0.007	0.007	0.006	0.018	0.028	0.013	0.025	0.012	0.014	0.014	0.001	0.000	6.70E-02	1.85E-01	4.53E-01	7.87E-03	Haight Ashbury Community Nursery School
548260	4179640	0.009	0.007	0.015	0.008	0.007	0.006	0.020	0.031	0.014	0.028	0.014	0.015	0.015	0.001	0.000	7.47E-02	1.92E-01	5.04E-01	7.17E-03	Haight Ashbury Community Nursery School
548280	4179640	0.008	0.006	0.015	0.007	0.007	0.006	0.018	0.029	0.013	0.026	0.013	0.014	0.014	0.001	0.000	7.07E-02	1.82E-01	4.65E-01	7.28E-03	Haight Ashbury Community Nursery School

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

Risk Calculation Part 2

		ISA		RAB				HDMC							IAH		R1*ΣC_{DPM}				
X (UTM)	Y (UTM	2022	2023	2022	2023	2024	2025	2023	2024	2025	2026	2027	2028	2029	2028	2029	ISA	RAB	HDMC	IAH	
547540	4179680	0.012	0.009	0.102	0.050	0.049	0.043	0.009	0.014	0.006	0.013	0.006	0.007	0.007	0.001	0.000	1.07E+00	9.35E+00	1.58E+00	4.62E-02	Lucia Child Care Center
547560	4179680	0.013	0.010	0.127	0.062	0.061	0.053	0.010	0.016	0.007	0.015	0.007	0.008	0.008	0.001	0.000	1.18E+00	1.16E+01	1.82E+00	4.73E-02	Lucia Child Care Center
547540	4179660	0.011	0.008	0.166	0.081	0.080	0.069	0.009	0.015	0.007	0.013	0.007	0.007	0.007	0.001	0.000	9.81E-01	1.52E+01	1.67E+00	4.82E-02	Lucia Child Care Center
547560	4179660	0.011	0.009	0.218	0.107	0.105	0.091	0.011	0.017	0.008	0.015	0.008	0.008	0.009	0.001	0.000	1.06E+00	2.00E+01	1.91E+00	4.93E-02	Lucia Child Care Center
547200	4179140	0.001	0.001	0.006	0.003	0.003	0.002	0.002	0.003	0.001	0.003	0.001	0.001	0.001	0.001	0.000	9.08E-02	5.19E-01	3.19E-01	5.59E-02	ABC Bay Area Child Care
547220	4179140	0.001	0.001	0.006	0.003	0.003	0.002	0.002	0.003	0.001	0.003	0.001	0.001	0.001	0.001	0.000	9.31E-02	5.24E-01	3.23E-01	5.84E-02	ABC Bay Area Child Care
547460	4179400	0.002	0.002	0.030	0.015	0.014	0.012	0.005	0.008	0.003	0.007	0.003	0.004	0.004	0.001	0.000	2.05E-01	2.73E+00	8.79E-01	7.02E-02	Kirkham Child Care Center
547480	4179400	0.002	0.002	0.029	0.014	0.014	0.012	0.005	0.008	0.004	0.007	0.004	0.004	0.004	0.001	0.000	1.97E-01	2.70E+00	9.18E-01	7.35E-02	Kirkham Child Care Center

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Unmitigated Construction Annual PM2.5 Concentration by Construction Year

Haul Truck Trip Adjustment Factor to Model

	One Way (miles)					
	ISA	RAB	HDMC	IAH1	IAH2	
CalEEMod, Haul	20	20	20	20	20	*haul truck trip distance as modeled in CalEEMod*
CalEEMod, Vend	7.3	7.3	7.3	7.3	7.3	*vendor trip distance as modeled in CalEEMod*
AERMOD	0.52	0.52	0.52	0.52	0.19	
% in Dispersion Model, Haul	3%	3%	3%	3%	1%	
% in Dispersion Model, Vend	7%	7%	7%	7%	3%	

Construction Emissions, *as applied to AERMOD results*

				Total Umitigated PM2.5 (tons)				Total Umitigated PM2.5 (g/s)			
	Year	Start Date	Stop Date	Offroad	Haul/Vend1	Haul/Vend2	Idle	Offroad	Haul1	Haul2	Idle
Irving Street Arrival	2022	3/1/2022	12/31/2022	4.24E-02	5.47E-06	--	1.69E-06	1.22E-03	1.57E-07	--	4.87E-08
	2023	1/1/2023	11/30/2023	3.54E-02	4.29E-06	--	0.00E+00	1.02E-03	1.24E-07	--	0.00E+00
Research and Academic Building	2022	3/1/2022	12/31/2022	1.26E-01	1.03E-04	--	6.12E-05	3.63E-03	2.98E-06	--	1.76E-06
	2023	1/1/2023	12/31/2023	7.65E-02	5.01E-05	--	0.00E+00	2.20E-03	1.44E-06	--	0.00E+00
	2024	1/1/2024	12/31/2024	7.55E-02	4.87E-05	--	0.00E+00	2.17E-03	1.40E-06	--	0.00E+00
	2025	1/1/2025	12/31/2025	6.54E-02	4.65E-05	--	0.00E+00	1.88E-03	1.34E-06	--	0.00E+00
New Hospital	2023	6/1/2023	12/31/2023	4.81E-02	0.00E+00	--	0.00E+00	1.38E-03	0.00E+00	--	0.00E+00
	2024	1/1/2024	12/31/2024	1.27E-01	9.06E-05	--	8.51E-05	3.65E-03	2.61E-06	--	2.45E-06
	2025	1/1/2025	12/31/2025	5.87E-02	1.67E-04	--	0.00E+00	1.69E-03	4.80E-06	--	0.00E+00
	2026	1/1/2026	12/31/2026	1.17E-01	3.18E-04	--	0.00E+00	3.38E-03	9.14E-06	--	0.00E+00
	2027	1/1/2027	12/31/2027	5.87E-02	1.52E-04	--	0.00E+00	1.69E-03	4.36E-06	--	0.00E+00
	2028	1/1/2028	12/31/2028	6.52E-02	1.45E-04	--	0.00E+00	1.88E-03	4.18E-06	--	0.00E+00
	2029	1/1/2029	12/31/2029	6.54E-02	1.40E-04	--	0.00E+00	1.88E-03	4.01E-06	--	0.00E+00
Initial phase of Aldea Housing Densification	2028	1/3/2028	12/31/2028	5.82E-02	1.87E-05	6.81E-06	2.77E-06	1.67E-03	5.37E-07	1.96E-07	7.97E-08
	2029	1/1/2029	1/11/2029	2.30E-04	0.00E+00	0.00E+00	0.00E+00	6.62E-06	0.00E+00	0.00E+00	0.00E+00

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

		ISA		RAB				HDMC							IAH		Max by Project			
X (UTM)	Y (UTM	2022	2023	2022	2023	2024	2025	2023	2024	2025	2026	2027	2028	2029	2028	2029	ISA	RAB	HDMC	IAH
547560	4179660	0.009	0.007	0.169	0.102	0.101	0.088	0.006	0.016	0.007	0.015	0.007	0.008	0.008	0.001	0.000	0.009	0.169	0.016	0.001
547520	4179640	0.007	0.006	0.163	0.099	0.097	0.084	0.005	0.013	0.006	0.012	0.006	0.007	0.007	0.001	0.000	0.007	0.163	0.013	0.001
547980	4179080	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.421	0.002	0.000	0.001	0.001	0.421
547980	4179100	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.421	0.002	0.000	0.001	0.001	0.421
547540	4179660	0.008	0.007	0.129	0.078	0.077	0.067	0.005	0.014	0.006	0.013	0.006	0.007	0.007	0.001	0.000	0.008	0.129	0.014	0.001
547500	4179640	0.007	0.005	0.116	0.070	0.069	0.060	0.004	0.011	0.005	0.011	0.005	0.006	0.006	0.001	0.000	0.007	0.116	0.011	0.001
548000	4179040	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.296	0.001	0.000	0.001	0.001	0.296
548000	4179100	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.295	0.001	0.000	0.001	0.001	0.295
548000	4179060	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.294	0.001	0.000	0.001	0.001	0.294
548000	4179080	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.284	0.001	0.000	0.001	0.001	0.284
548000	4179120	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.279	0.001	0.000	0.001	0.001	0.279
547560	4179680	0.010	0.008	0.098	0.060	0.059	0.051	0.006	0.015	0.007	0.014	0.007	0.008	0.008	0.001	0.000	0.010	0.098	0.015	0.001
547520	4179660	0.008	0.006	0.097	0.059	0.058	0.050	0.004	0.012	0.006	0.011	0.006	0.006	0.006	0.001	0.000	0.008	0.097	0.012	0.001
547440	4179580	0.004	0.004	0.097	0.059	0.058	0.050	0.003	0.009	0.004	0.009	0.004	0.005	0.005	0.001	0.000	0.004	0.097	0.009	0.001
548000	4179020	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.247	0.001	0.000	0.001	0.001	0.247
547460	4179620	0.005	0.004	0.092	0.056	0.055	0.048	0.003	0.009	0.005	0.009	0.005	0.005	0.005	0.001	0.000	0.005	0.092	0.009	0.001
547440	4179540	0.004	0.003	0.089	0.054	0.053	0.046	0.003	0.009	0.004	0.008	0.004	0.004	0.004	0.001	0.000	0.004	0.089	0.009	0.001
547480	4179640	0.006	0.005	0.088	0.053	0.052	0.045	0.004	0.010	0.005	0.009	0.005	0.005	0.005	0.001	0.000	0.006	0.088	0.010	0.001
547980	4179760	0.022	0.019	0.022	0.013	0.013	0.011	0.072	0.189	0.087	0.175	0.087	0.097	0.097	0.001	0.000	0.022	0.022	0.189	0.001
548000	4179140	0.000	0.000	0.002	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.194	0.001	0.000	0.002	0.001	0.194
548020	4179080	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.191	0.001	0.000	0.001	0.001	0.191
547980	4179720	0.016	0.014	0.020	0.012	0.012	0.010	0.061	0.162	0.075	0.150	0.075	0.083	0.084	0.001	0.000	0.016	0.020	0.162	0.001
547980	4179700	0.014	0.011	0.020	0.012	0.012	0.010	0.061	0.161	0.074	0.148	0.074	0.082	0.083	0.001	0.000	0.014	0.020	0.161	0.001
548000	4179760	0.020	0.016	0.021	0.012	0.012	0.011	0.059	0.155	0.072	0.143	0.072	0.080	0.080	0.001	0.000	0.020	0.021	0.155	0.001
547980	4179740	0.019	0.016	0.020	0.012	0.012	0.010	0.058	0.153	0.071	0.141	0.071	0.079	0.079	0.001	0.000	0.019	0.020	0.153	0.001
547860	4179780	0.072	0.060	0.029	0.018	0.017	0.015	0.045	0.119	0.055	0.110	0.055	0.061	0.061	0.001	0.000	0.072	0.029	0.119	0.001
547980	4179780	0.024	0.020	0.021	0.012	0.012	0.011	0.056	0.149	0.069	0.138	0.069	0.077	0.077	0.001	0.000	0.024	0.021	0.149	0.001
547980	4179680	0.011	0.009	0.021	0.013	0.013	0.011	0.055	0.147	0.068	0.135	0.068	0.075	0.075	0.001	0.000	0.011	0.021	0.147	0.001
547740	4179820	0.086	0.072	0.021	0.013	0.012	0.011	0.009	0.023	0.011	0.022	0.011	0.012	0.012	0.001	0.000	0.086	0.021	0.023	0.001
548000	4179700	0.013	0.011	0.020	0.012	0.012	0.010	0.053	0.140	0.065	0.130	0.065	0.072	0.072	0.001	0.000	0.013	0.020	0.140	0.001
547860	4179800	0.073	0.060	0.025	0.015	0.015	0.013	0.027	0.071	0.033	0.066	0.033	0.037	0.037	0.001	0.000	0.073	0.025	0.071	0.001
548000	4179720	0.015	0.013	0.019	0.012	0.012	0.010	0.053	0.139	0.064	0.128	0.064	0.071	0.072	0.001	0.000	0.015	0.019	0.139	0.001
548000	4179740	0.017	0.014	0.019	0.012	0.011	0.010	0.050	0.133	0.062	0.123	0.062	0.068	0.069	0.001	0.000	0.017	0.019	0.133	0.001
547860	4179820	0.065	0.054	0.021	0.013	0.013	0.011	0.018	0.048	0.022	0.044	0.022	0.025	0.025	0.001	0.000	0.065	0.021	0.048	0.001
547760	4179840	0.059	0.049	0.018	0.011	0.011	0.009	0.008	0.022	0.010	0.020	0.010	0.011	0.011	0.001	0.000	0.059	0.018	0.022	0.001
547860	4179840	0.058	0.048	0.018	0.011	0.011	0.009	0.013	0.034	0.016	0.032	0.016	0.018	0.018	0.001	0.000	0.058	0.018	0.034	0.001
547700	4179820	0.046	0.038	0.019	0.012	0.012	0.010	0.007	0.018	0.009	0.017	0.009	0.009	0.009	0.001	0.000	0.046	0.019	0.018	0.001
547740	4179840	0.046	0.039	0.017	0.011	0.010	0.009	0.007	0.020	0.009	0.018	0.009	0.010	0.010	0.001	0.000	0.046	0.017	0.020	0.001
547840	4179860	0.048	0.040	0.016	0.009	0.009	0.008	0.009	0.024	0.011	0.022	0.011	0.012	0.013	0.001	0.000	0.048	0.016	0.024	0.001

AIR Construction HRA Calculations (Mitigated)

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Mitigated Irving Street Arrival Construction Cancer Risk Calculations for Residential Child Receptor

Haul Truck Trip Adjustment Factor to Model

	One Way (miles)				
	ISA	RAB	HDMC	IAH1	IAH2
CalEEMod, Haul	20	20	20	20	20
CalEEMod, Vend	7.3	7.3	7.3	7.3	7.3
AERMOD	0.52	0.52	0.52	0.52	0.19
% in Dispersion Model, Haul	3%	3%	3%	3%	1%
% in Dispersion Model, Vend	7%	7%	7%	7%	3%

haul truck trip distance as modeled in CalEEMod

vendor trip distance as modeled in CalEEMod

Construction Emissions, *as applied to AERMOD results*

	Year	Start Date	Stop Date	Days				Total Mitigated DPM (tons)				Total Mitigated DPM (g/s)			
				3rd Trimester	0<2	2<9	Duration	Offroad	Haul/Vend1	Haul/Vend2	Idle	Offroad	Haul1	Haul2	Idle
Irving Street Arrival	2022	3/1/2022	12/31/2022	91.00	215.00	0	306	2.40E-03	5.74E-06	--	1.77E-06	8.24E-05	1.97E-07	--	6.07E-08
	2023	1/1/2023	11/30/2023	0.00	334.00	0	334	2.24E-03	4.29E-06	--	0.00E+00	7.04E-05	1.35E-07	--	0.00E+00

Risk Factors

	Abbreviation	UOM	3rd Trimester	0<2	2<9
Daily Breathing Rate (95th %'ile)	DBR	L/kg-day	361	1090	631
Fraction Of Time At Home	FAH	unitless	1	1	1
Exposure Frequency	EF	days/year	0.96	0.96	0.96
Age Sensitivity Factor	ASF	unitless	10	10	3
Inhalation Absorption Factor	A	unitless	1	1	1
Conversion Factor	CF_1	m^3/L	0.001	0.001	0.001
Conversion Factor	CF_2	$\mu g/m^3$	0.001	0.001	0.001
Cancer Potency Factor (diesel exhaust)	CPF	$mg/kg\text{-}day^{-1}$	1.1	1.1	1.1
Averaging Time (for residential exposure)	AT	years	70.00	70.00	70.00

Intake Factor for Inhalation, IF (m^3/kg-day)

	Year	Equation	3rd Trimester	0<2	2<9
Irving Street Arrival	2022	DBR*FAH*EF *ED*ASF*A* CF/AT	0.012	0.088	0.000
	2023		0.000	0.137	0.000

Risk Calculation Part 1, R1

	3rd Trimester	0<2	2<9
IF*CPF*CF	1.36E-05	9.67E-05	0.00E+00
	0.00E+00	1.50E-04	0.00E+00

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

		ISA	
X (UTM)	Y (UTM	2022	2023
547740	4179820	0.006	0.005
547860	4179800	0.005	0.004
547860	4179780	0.005	0.004
547860	4179820	0.004	0.004
547760	4179840	0.004	0.003
547860	4179840	0.004	0.003
547840	4179860	0.003	0.003
547740	4179840	0.003	0.003
547700	4179820	0.003	0.003
547860	4179860	0.003	0.003
547880	4179860	0.003	0.002
547900	4179820	0.003	0.002
547720	4179840	0.003	0.002
547900	4179840	0.002	0.002
547760	4179860	0.002	0.002
547900	4179860	0.002	0.002
547680	4179820	0.002	0.002
547840	4179880	0.002	0.002
547860	4179880	0.002	0.002
547820	4179880	0.002	0.002
547920	4179820	0.002	0.002
547700	4179840	0.002	0.002
547880	4179880	0.002	0.002
547800	4179880	0.002	0.002
547740	4179860	0.002	0.002
547940	4179800	0.002	0.002
547920	4179860	0.002	0.002
547900	4179880	0.002	0.002
547940	4179820	0.002	0.002
547920	4179840	0.002	0.002
547660	4179820	0.002	0.001
547780	4179880	0.002	0.001
547920	4179880	0.002	0.001
547960	4179800	0.002	0.001
547940	4179860	0.002	0.001
547940	4179840	0.002	0.001
547720	4179860	0.002	0.001
547680	4179840	0.002	0.001
547960	4179820	0.002	0.001
547980	4179780	0.002	0.001
547960	4179840	0.002	0.001
547960	4179860	0.002	0.001
547860	4179900	0.002	0.001
547880	4179900	0.002	0.001
547980	4179800	0.002	0.001
547940	4179880	0.002	0.001
547840	4179900	0.002	0.001
547980	4179820	0.002	0.001
547980	4179760	0.002	0.001
547980	4179840	0.002	0.001
547760	4179880	0.002	0.001
547900	4179900	0.001	0.001
548000	4179780	0.001	0.001
547820	4179900	0.001	0.001
548000	4179800	0.001	0.001
547700	4179860	0.001	0.001
547980	4179860	0.001	0.001
548000	4179820	0.001	0.001
547920	4179900	0.001	0.001
547960	4179880	0.001	0.001
548020	4179780	0.001	0.001
547640	4179820	0.001	0.001
548000	4179840	0.001	0.001
548020	4179800	0.001	0.001
548000	4179760	0.001	0.001
547660	4179840	0.001	0.001
547740	4179880	0.001	0.001
547940	4179900	0.001	0.001
547800	4179900	0.001	0.001
548020	4179820	0.001	0.001
547980	4179740	0.001	0.001
548000	4179860	0.001	0.001
548040	4179780	0.001	0.001
547980	4179880	0.001	0.001
548040	4179800	0.001	0.001
548020	4179840	0.001	0.001
548020	4179760	0.001	0.001
547680	4179860	0.001	0.001
548040	4179820	0.001	0.001
547960	4179900	0.001	0.001

Risk Calculation Part 2

	$\sum R1*C_{DPM}$			Cancer Risk	
3rd Trimeste	0<2	2<9	Total	per million	Receptor Determination
7.89E-08	1.31E-06	0.00E+00	1.39E-06	1.39	pot. res.
6.64E-08	1.10E-06	0.00E+00	1.17E-06	1.17	pot. res.
6.63E-08	1.10E-06	0.00E+00	1.17E-06	1.17	pot. res.
5.95E-08	9.87E-07	0.00E+00	1.05E-06	1.05	pot. res.
5.42E-08	9.00E-07	0.00E+00	9.55E-07	0.95	pot. res.
5.27E-08	8.76E-07	0.00E+00	9.28E-07	0.93	pot. res.
4.42E-08	7.33E-07	0.00E+00	7.77E-07	0.78	pot. res.
4.24E-08	7.04E-07	0.00E+00	7.47E-07	0.75	pot. res.
4.22E-08	7.00E-07	0.00E+00	7.42E-07	0.74	pot. res.
4.05E-08	6.73E-07	0.00E+00	7.14E-07	0.71	pot. res.
3.62E-08	6.01E-07	0.00E+00	6.38E-07	0.64	pot. res.
3.52E-08	5.84E-07	0.00E+00	6.19E-07	0.62	pot. res.
3.45E-08	5.73E-07	0.00E+00	6.08E-07	0.61	pot. res.
3.15E-08	5.23E-07	0.00E+00	5.54E-07	0.55	pot. res.
3.14E-08	5.21E-07	0.00E+00	5.53E-07	0.55	pot. res.
3.12E-08	5.18E-07	0.00E+00	5.49E-07	0.55	pot. res.
3.11E-08	5.17E-07	0.00E+00	5.48E-07	0.55	pot. res.
3.02E-08	5.02E-07	0.00E+00	5.32E-07	0.53	pot. res.
2.95E-08	4.90E-07	0.00E+00	5.20E-07	0.52	pot. res.
2.93E-08	4.86E-07	0.00E+00	5.16E-07	0.52	pot. res.
2.85E-08	4.74E-07	0.00E+00	5.02E-07	0.50	pot. res.
2.78E-08	4.61E-07	0.00E+00	4.89E-07	0.49	pot. res.
2.77E-08	4.61E-07	0.00E+00	4.88E-07	0.49	pot. res.
2.66E-08	4.41E-07	0.00E+00	4.68E-07	0.47	pot. res.
2.64E-08	4.38E-07	0.00E+00	4.65E-07	0.46	pot. res.
2.63E-08	4.36E-07	0.00E+00	4.63E-07	0.46	pot. res.
2.56E-08	4.25E-07	0.00E+00	4.50E-07	0.45	pot. res.
2.55E-08	4.23E-07	0.00E+00	4.49E-07	0.45	pot. res.
2.46E-08	4.08E-07	0.00E+00	4.32E-07	0.43	pot. res.
2.43E-08	4.04E-07	0.00E+00	4.28E-07	0.43	pot. res.
2.38E-08	3.95E-07	0.00E+00	4.19E-07	0.42	pot. res.
2.32E-08	3.86E-07	0.00E+00	4.09E-07	0.41	pot. res.
2.32E-08	3.85E-07	0.00E+00	4.08E-07	0.41	pot. res.
2.30E-08	3.81E-07	0.00E+00	4.04E-07	0.40	pot. res.
2.30E-08	3.81E-07	0.00E+00	4.04E-07	0.40	pot. res.
2.28E-08	3.78E-07	0.00E+00	4.01E-07	0.40	pot. res.
2.25E-08	3.73E-07	0.00E+00	3.95E-07	0.40	pot. res.
2.22E-08	3.69E-07	0.00E+00	3.92E-07	0.39	pot. res.
2.21E-08	3.67E-07	0.00E+00	3.89E-07	0.39	pot. res.
2.20E-08	3.65E-07	0.00E+00	3.87E-07	0.39	pot. res.
2.17E-08	3.61E-07	0.00E+00	3.83E-07	0.38	pot. res.
2.15E-08	3.57E-07	0.00E+00	3.78E-07	0.38	pot. res.
2.14E-08	3.56E-07	0.00E+00	3.77E-07	0.38	pot. res.
2.11E-08	3.50E-07	0.00E+00	3.71E-07	0.37	pot. res.
2.10E-08	3.48E-07	0.00E+00	3.69E-07	0.37	pot. res.
2.10E-08	3.48E-07	0.00E+00	3.69E-07	0.37	pot. res.
2.10E-08	3.48E-07	0.00E+00	3.69E-07	0.37	pot. res.
2.05E-08	3.41E-07	0.00E+00	3.61E-07	0.36	pot. res.
2.05E-08	3.41E-07	0.00E+00	3.61E-07	0.36	pot. res.
2.04E-08	3.39E-07	0.00E+00	3.59E-07	0.36	pot. res.
2.04E-08	3.38E-07	0.00E+00	3.59E-07	0.36	pot. res.
2.02E-08	3.35E-07	0.00E+00	3.56E-07	0.36	pot. res.
2.01E-08	3.34E-07	0.00E+00	3.54E-07	0.35	pot. res.
1.97E-08	3.28E-07	0.00E+00	3.47E-07	0.35	pot. res.
1.95E-08	3.23E-07	0.00E+00	3.42E-07	0.34	pot. res.
1.92E-08	3.19E-07	0.00E+00	3.38E-07	0.34	pot. res.
1.92E-08	3.18E-07	0.00E+00	3.38E-07	0.34	pot. res.
1.90E-08	3.15E-07	0.00E+00	3.34E-07	0.33	pot. res.
1.90E-08	3.15E-07	0.00E+00	3.34E-07	0.33	pot. res.
1.89E-08	3.14E-07	0.00E+00	3.33E-07	0.33	pot. res.
1.86E-08	3.08E-07	0.00E+00	3.27E-07	0.33	pot. res.
1.84E-08	3.05E-07	0.00E+00	3.24E-07	0.32	pot. res.
1.83E-08	3.03E-07	0.00E+00	3.21E-07	0.32	pot. res.
1.82E-08	3.02E-07	0.00E+00	3.20E-07	0.32	pot. res.
1.81E-08	3.01E-07	0.00E+00	3.19E-07	0.32	pot. res.
1.80E-08	3.00E-07	0.00E+00	3.18E-07	0.32	pot. res.
1.79E-08	2.97E-07	0.00E+00	3.15E-07	0.31	pot. res.
1.76E-08	2.92E-07	0.00E+00	3.10E-07	0.31	pot. res.
1.76E-08	2.92E-07	0.00E+00	3.10E-07	0.31	pot. res.
1.75E-08	2.90E-07	0.00E+00	3.08E-07	0.31	pot. res.
1.72E-08	2.85E-07	0.00E+00	3.03E-07	0.30	pot. res.
1.71E-08	2.84E-07	0.00E+00	3.01E-07	0.30	pot. res.
1.71E-08	2.84E-07	0.00E+00	3.01E-07	0.30	pot. res.
1.70E-08	2.83E-07	0.00E+00	3.00E-07	0.30	pot. res.
1.70E-08	2.82E-07	0.00E+00	2.99E-07	0.30	pot. res.
1.68E-08	2.78E-07	0.00E+00	2.95E-07	0.30	pot. res.
1.64E-08	2.72E-07	0.00E+00	2.88E-07	0.29	pot. res.
1.63E-08	2.71E-07	0.00E+00	2.87E-07	0.29	pot. res.
1.63E-08	2.70E-07	0.00E+00	2.87E-07	0.29	pot. res.
1.62E-08	2.69E-07	0.00E+00	2.86E-07	0.29	pot. res.

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Mitigated Research and Academic Building Construction Cancer Risk Calculations for Residential Child Receptor

Haul Truck Trip Adjustment Factor to Model

	One Way (miles)					
	ISA	RAB	HDMC	IAH1	IAH2	
CalEEMod, Haul	20	20	20	20	20	*haul truck trip distance as modeled in CalEEMod*
CalEEMod, Vend	7.3	7.3	7.3	7.3	7.3	*vendor trip distance as modeled in CalEEMod*
AERMOD	0.52	0.52	0.52	0.52	0.19	
% in Dispersion Model, Haul	3%	3%	3%	3%	1%	
% in Dispersion Model, Vend	7%	7%	7%	7%	3%	

Construction Emissions, *as applied to AERMOD results*

				Days				Total Mitigated DPM (tons)				Total Mitigated DPM (g/s)			
	Year	Start Date	Stop Date	3rd Trimester	0<2	2<9	Duration	Offroad	Haul/Vend1	Haul/Vend2	Idle	Offroad	Haul1	Haul2	Idle
Research and Academic Building	2022	3/1/2022	12/31/2022	91.00	215.00	0.00	306					2.27E-04	3.70E-06	--	2.20E-06
	2023	1/1/2023	12/31/2023	0.00	365.00	0.00	365					1.31E-04	1.52E-06	--	0.00E+00
	2024	1/1/2024	12/31/2024	0.00	150.00	216.00	366					1.47E-04	1.46E-06	--	0.00E+00
	2025	1/1/2025	12/31/2025	0.00	0.00	365.00	365					1.47E-04	1.40E-06	--	0.00E+00

Risk Factors

	Abbreviation	UOM	3rd Trimester	0<2	2<9
Daily Breathing Rate (95th %'ile)	DBR	L/kg-day	361	1090	631
Fraction Of Time At Home	FAH	unitless	1	1	1
Exposure Frequency	EF	days/year	0.96	0.96	0.96
Age Sensitivity Factor	ASF	unitless	10	10	3
Inhalation Absorption Factor	A	unitless	1	1	1
Conversion Factor	CF_1	m^3/L	0.001	0.001	0.001
Conversion Factor	CF_2	$\mu g/m^3$	0.001	0.001	0.001
Cancer Potency Factor (diesel exhaust)	CPF	$mg/kg\text{-}day^{-1}$	1.1	1.1	1.1
Averaging Time (for residential exposure)	AT	years	70.00	70.00	70.00

Intake Factor for Inhalation, IF (m^3/kg-day)

	Year	Equation	3rd Trimester	0<2	2<9
Research and Academic Building	2022	DBR*FAH*EF *ED*ASF*A* CF/AT	0.012	0.088	0.000
	2023		0.000	0.149	0.000
	2024		0.000	0.061	0.015
	2025		0.000	0.000	0.026

Risk Calculation Part 1, R1

	3rd Trimester	0<2	2<9
IF*CPF*CF	1.36E-05	9.67E-05	0.00E+00
	0.00E+00	1.64E-04	0.00E+00
	0.00E+00	6.75E-05	1.69E-05
	0.00E+00	0.00E+00	2.86E-05

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

		RAB			
X (UTM)	Y (UTM	2021	2022	2023	2024
547520	4179640	0.011	0.006	0.007	0.007
547500	4179640	0.008	0.004	0.005	0.005
547520	4179660	0.006	0.004	0.004	0.004
547440	4179580	0.006	0.004	0.004	0.004
547460	4179620	0.006	0.003	0.004	0.004
547440	4179540	0.006	0.003	0.004	0.004
547480	4179640	0.006	0.003	0.004	0.004
547440	4179600	0.006	0.003	0.004	0.004
547500	4179660	0.005	0.003	0.003	0.003
547440	4179520	0.005	0.003	0.003	0.003
547420	4179580	0.005	0.003	0.003	0.003
547440	4179620	0.004	0.002	0.003	0.003
547460	4179640	0.004	0.002	0.003	0.003
547520	4179680	0.004	0.002	0.003	0.003
547560	4179700	0.004	0.002	0.003	0.003
547480	4179660	0.004	0.002	0.003	0.002
547420	4179600	0.004	0.002	0.003	0.003
547440	4179500	0.004	0.002	0.002	0.002
547540	4179700	0.003	0.002	0.002	0.002
547500	4179680	0.003	0.002	0.002	0.002
547400	4179560	0.003	0.002	0.002	0.002
547440	4179640	0.003	0.002	0.002	0.002
547400	4179540	0.003	0.002	0.002	0.002
547420	4179620	0.003	0.002	0.002	0.002
547400	4179580	0.004	0.002	0.002	0.002
547460	4179660	0.003	0.002	0.002	0.002
547580	4179720	0.003	0.002	0.002	0.002
547400	4179520	0.003	0.002	0.002	0.002
547440	4179480	0.003	0.002	0.002	0.002
547520	4179700	0.003	0.002	0.002	0.002
547400	4179600	0.003	0.002	0.002	0.002
547480	4179680	0.003	0.002	0.002	0.002
547560	4179720	0.003	0.002	0.002	0.002
547400	4179500	0.003	0.002	0.002	0.002
547380	4179540	0.003	0.002	0.002	0.002
547420	4179640	0.003	0.002	0.002	0.002
547380	4179560	0.003	0.002	0.002	0.002
547440	4179660	0.003	0.001	0.002	0.002
547380	4179520	0.003	0.001	0.002	0.002
547500	4179700	0.003	0.001	0.002	0.002
547540	4179720	0.002	0.001	0.002	0.002
547380	4179580	0.003	0.002	0.002	0.002
547400	4179620	0.003	0.001	0.002	0.002
547440	4179460	0.002	0.001	0.002	0.002
547460	4179680	0.002	0.001	0.002	0.002
547400	4179480	0.002	0.001	0.002	0.002
547380	4179500	0.002	0.001	0.001	0.001
547380	4179600	0.003	0.001	0.002	0.002
547580	4179740	0.002	0.001	0.001	0.001
547480	4179700	0.002	0.001	0.001	0.001
547520	4179720	0.002	0.001	0.001	0.001
547420	4179660	0.002	0.001	0.001	0.001
547360	4179540	0.002	0.001	0.001	0.001
547400	4179640	0.002	0.001	0.001	0.001
547380	4179480	0.002	0.001	0.001	0.001
547360	4179560	0.002	0.001	0.001	0.001
547560	4179740	0.002	0.001	0.001	0.001
547440	4179440	0.002	0.001	0.001	0.001
547400	4179460	0.002	0.001	0.001	0.001
547360	4179520	0.002	0.001	0.001	0.001
547440	4179680	0.002	0.001	0.001	0.001

Risk Calculation Part 2

	$\sum R1*C_{DPM}$				Cancer Risk	Receptor
3rd Trimeste	0<2	2<9	Total	per million	Determination
1.44E-07	2.46E-06	3.04E-07	2.91E-06	2.91	pot. res.
1.02E-07	1.75E-06	2.17E-07	2.07E-06	2.07	res.
8.46E-08	1.45E-06	1.80E-07	1.72E-06	1.72	res.
8.69E-08	1.49E-06	1.83E-07	1.76E-06	1.76	res.
8.28E-08	1.42E-06	1.75E-07	1.67E-06	1.67	res.
7.81E-08	1.34E-06	1.66E-07	1.59E-06	1.59	res.
7.74E-08	1.33E-06	1.64E-07	1.57E-06	1.57	res.
7.87E-08	1.33E-06	1.63E-07	1.58E-06	1.58	res.
6.57E-08	1.13E-06	1.40E-07	1.33E-06	1.33	res.
6.47E-08	1.11E-06	1.38E-07	1.31E-06	1.31	res.
6.32E-08	1.07E-06	1.31E-07	1.27E-06	1.27	res.
5.98E-08	1.02E-06	1.26E-07	1.21E-06	1.21	res.
5.88E-08	1.01E-06	1.25E-07	1.19E-06	1.19	res.
5.55E-08	9.53E-07	1.18E-07	1.13E-06	1.13	res.
5.46E-08	9.39E-07	1.16E-07	1.11E-06	1.11	res.
5.35E-08	9.19E-07	1.14E-07	1.09E-06	1.09	res.
5.65E-08	9.57E-07	1.16E-07	1.13E-06	1.13	res.
5.17E-08	8.89E-07	1.10E-07	1.05E-06	1.05	res.
4.63E-08	7.96E-07	9.85E-08	9.40E-07	0.94	res.
4.59E-08	7.88E-07	9.76E-08	9.32E-07	0.93	res.
4.75E-08	8.09E-07	9.92E-08	9.55E-07	0.96	res.
4.54E-08	7.79E-07	9.62E-08	9.20E-07	0.92	res.
4.55E-08	7.80E-07	9.62E-08	9.22E-07	0.92	res.
4.48E-08	7.66E-07	9.42E-08	9.05E-07	0.90	res.
5.03E-08	8.42E-07	1.01E-07	9.94E-07	0.99	res.
4.30E-08	7.38E-07	9.13E-08	8.73E-07	0.87	res.
4.26E-08	7.32E-07	9.07E-08	8.66E-07	0.87	res.
4.20E-08	7.21E-07	8.91E-08	8.52E-07	0.85	res.
4.12E-08	7.09E-07	8.79E-08	8.38E-07	0.84	res.
3.95E-08	6.79E-07	8.41E-08	8.03E-07	0.80	res.
4.25E-08	7.21E-07	8.78E-08	8.51E-07	0.85	res.
3.92E-08	6.74E-07	8.34E-08	7.97E-07	0.80	res.
3.84E-08	6.61E-07	8.18E-08	7.81E-07	0.78	res.
3.73E-08	6.40E-07	7.92E-08	7.57E-07	0.76	res.
3.67E-08	6.27E-07	7.71E-08	7.41E-07	0.74	res.
3.61E-08	6.19E-07	7.63E-08	7.31E-07	0.73	res.
3.82E-08	6.47E-07	7.89E-08	7.64E-07	0.76	res.
3.54E-08	6.07E-07	7.50E-08	7.18E-07	0.72	res.
3.46E-08	5.93E-07	7.31E-08	7.00E-07	0.70	res.
3.40E-08	5.85E-07	7.24E-08	6.91E-07	0.69	res.
3.39E-08	5.83E-07	7.22E-08	6.89E-07	0.69	res.
4.20E-08	6.97E-07	8.25E-08	8.21E-07	0.82	res.
3.52E-08	6.00E-07	7.37E-08	7.09E-07	0.71	res.
3.36E-08	5.78E-07	7.17E-08	6.84E-07	0.68	res.
3.31E-08	5.68E-07	7.02E-08	6.71E-07	0.67	res.
3.23E-08	5.55E-07	6.87E-08	6.56E-07	0.66	res.
3.17E-08	5.44E-07	6.72E-08	6.42E-07	0.64	res.
3.40E-08	5.76E-07	6.99E-08	6.80E-07	0.68	res.
3.08E-08	5.29E-07	6.55E-08	6.25E-07	0.62	res.
3.00E-08	5.15E-07	6.37E-08	6.09E-07	0.61	res.
2.98E-08	5.12E-07	6.34E-08	6.05E-07	0.60	res.
2.90E-08	4.97E-07	6.13E-08	5.87E-07	0.59	res.
3.00E-08	5.11E-07	6.26E-08	6.03E-07	0.60	res.
2.92E-08	5.00E-07	6.16E-08	5.91E-07	0.59	res.
2.84E-08	4.88E-07	6.04E-08	5.77E-07	0.58	res.
3.14E-08	5.29E-07	6.41E-08	6.25E-07	0.62	res.
2.82E-08	4.84E-07	6.00E-08	5.73E-07	0.57	res.
2.78E-08	4.78E-07	5.93E-08	5.65E-07	0.56	res.
2.78E-08	4.79E-07	5.93E-08	5.66E-07	0.57	res.
2.86E-08	4.90E-07	6.03E-08	5.79E-07	0.58	res.
2.81E-08	4.82E-07	5.96E-08	5.70E-07	0.57	res.

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Mitigated New Hospital Construction Cancer Risk Calculations for Residential Child Receptor

Haul Truck Trip Adjustment Factor to Model

	One Way (miles)					
	ISA	RAB	HDMC	IAH1	IAH2	
CalEEMod, Haul	20	20	20	20	20	*haul truck trip distance as modeled in CalEEMod*
CalEEMod, Vend	7.3	7.3	7.3	7.3	7.3	*vendor trip distance as modeled in CalEEMod*
AERMOD	0.52	0.52	0.52	0.52	0.19	
% in Dispersion Model, Haul	3%	3%	3%	3%	1%	
% in Dispersion Model, Vend	7%	7%	7%	7%	3%	

Construction Emissions, *as applied to AERMOD results*

				Days				Total Umitigated DPM (tons)				Total Umitigated DPM (g/s)			
	Year	Start Date	Stop Date	3rd Trimester	0<2	2<9	Duration	Offroad	Haul/Vend1	Haul/Vend2	Idle	Offroad	Haul1	Haul2	Idle
New Hospital	2023	6/1/2023	12/31/2023	90.00	124.00	0.00	214					1.40E-04	0.00E+00	--	0.00E+00
	2024	1/1/2024	12/31/2024	0.00	366.00	0.00	366					2.77E-04	2.72E-06	--	2.55E-06
	2025	1/1/2025	12/31/2025	0.00	240.00	125.00	365					1.32E-04	5.00E-06	--	0.00E+00
	2026	1/1/2026	12/31/2026	0.00	0.00	365.00	365					2.64E-04	9.55E-06	--	0.00E+00
	2027	1/1/2027	12/31/2027	0.00	0.00	365.00	365					1.32E-04	4.57E-06	--	0.00E+00
	2028	1/1/2028	12/31/2028	0.00	0.00	366.00	366					1.46E-04	4.35E-06	--	0.00E+00
	2029	1/1/2029	12/31/2029	0.00	0.00	365.00	365					1.47E-04	4.20E-06	--	0.00E+00

Risk Factors

	Abbreviation	UOM	3rd Trimester	0<2	2<9
Daily Breathing Rate (95th %'ile)	DBR	L/kg-day	361	1090	631
Fraction Of Time At Home	FAH	unitless	1	1	1
Exposure Frequency	EF	days/year	0.96	0.96	0.96
Age Sensitivity Factor	ASF	unitless	10	10	3
Inhalation Absorption Factor	A	unitless	1	1	1
Conversion Factor	CF_1	m^3/L	0.001	0.001	0.001
Conversion Factor	CF_2	$\mu g/m^3$	0.001	0.001	0.001
Cancer Potency Factor (diesel exhaust)	CPF	$mg/kg\text{-}day^{-1}$	1.1	1.1	1.1
Averaging Time (for residential exposure)	AT	years	70.00	70.00	70.00

Intake Factor for Inhalation, IF (m^3/kg-day)

	Year	Equation	3rd Trimester	0<2	2<9
New Hospital	2023		0.012	0.051	0.000
	2024		0.000	0.150	0.000
	2025	DBR*FAH*EF	0.000	0.098	0.009
	2026	*ED*ASF*A*	0.000	0.000	0.026
	2027	CF/AT	0.000	0.000	0.026
	2028		0.000	0.000	0.026
	2029		0.000	0.000	0.026

Risk Calculation Part 1, R1

	3rd Trimester	0<2	2<9
	1.34E-05	5.58E-05	0.00E+00
	0.00E+00	1.65E-04	0.00E+00
	0.00E+00	1.08E-04	9.78E-06
IF*CPF*CF	0.00E+00	0.00E+00	2.86E-05
	0.00E+00	0.00E+00	2.86E-05
	0.00E+00	0.00E+00	2.86E-05
	0.00E+00	0.00E+00	2.86E-05

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

		HDMC						
X (UTM)	Y (UTM	2023	2024	2025	2026	2027	2028	2029
547980	4179760	0.007	0.015	0.007	0.014	0.007	0.008	0.008
547980	4179720	0.006	0.012	0.006	0.012	0.006	0.007	0.007
547980	4179700	0.006	0.012	0.006	0.012	0.006	0.006	0.006
548000	4179760	0.006	0.012	0.006	0.011	0.006	0.006	0.006
547980	4179740	0.006	0.012	0.006	0.011	0.006	0.006	0.006
547980	4179780	0.006	0.011	0.005	0.011	0.005	0.006	0.006
547980	4179680	0.006	0.011	0.005	0.011	0.005	0.006	0.006
548000	4179700	0.005	0.011	0.005	0.010	0.005	0.006	0.006
548000	4179720	0.005	0.011	0.005	0.010	0.005	0.006	0.006
548000	4179740	0.005	0.010	0.005	0.010	0.005	0.005	0.005
548000	4179680	0.005	0.010	0.005	0.009	0.005	0.005	0.005
548020	4179760	0.005	0.010	0.005	0.009	0.005	0.005	0.005
548000	4179780	0.005	0.010	0.005	0.009	0.005	0.005	0.005
548040	4179720	0.005	0.010	0.005	0.009	0.005	0.005	0.005
547940	4179800	0.005	0.009	0.004	0.009	0.004	0.005	0.005
548020	4179720	0.005	0.009	0.004	0.009	0.004	0.005	0.005
547960	4179800	0.005	0.009	0.004	0.009	0.004	0.005	0.005
548020	4179700	0.005	0.009	0.004	0.009	0.004	0.005	0.005
547860	4179780	0.005	0.009	0.004	0.009	0.004	0.005	0.005
548040	4179740	0.005	0.009	0.004	0.009	0.004	0.005	0.005
548020	4179740	0.005	0.009	0.004	0.009	0.004	0.005	0.005
547980	4179660	0.005	0.009	0.004	0.009	0.004	0.005	0.005
548040	4179700	0.005	0.009	0.004	0.009	0.004	0.005	0.005
548060	4179720	0.004	0.009	0.004	0.008	0.004	0.005	0.005
548060	4179700	0.004	0.009	0.004	0.008	0.004	0.005	0.005
548020	4179680	0.004	0.009	0.004	0.008	0.004	0.004	0.005
547980	4179800	0.004	0.009	0.004	0.008	0.004	0.004	0.004
548040	4179760	0.004	0.008	0.004	0.008	0.004	0.004	0.004
548000	4179660	0.004	0.008	0.004	0.008	0.004	0.004	0.004
548020	4179780	0.004	0.008	0.004	0.008	0.004	0.004	0.004
548040	4179680	0.004	0.008	0.004	0.008	0.004	0.004	0.004
548060	4179680	0.004	0.008	0.004	0.008	0.004	0.004	0.004
548080	4179700	0.004	0.008	0.004	0.007	0.004	0.004	0.004
548060	4179740	0.004	0.008	0.004	0.007	0.004	0.004	0.004
548000	4179800	0.004	0.008	0.004	0.007	0.004	0.004	0.004
548080	4179680	0.004	0.008	0.004	0.007	0.004	0.004	0.004
548020	4179660	0.004	0.007	0.004	0.007	0.004	0.004	0.004
548040	4179780	0.004	0.007	0.003	0.007	0.003	0.004	0.004
548060	4179760	0.003	0.007	0.003	0.007	0.003	0.004	0.004
548080	4179720	0.003	0.007	0.003	0.007	0.003	0.004	0.004
548040	4179660	0.003	0.007	0.003	0.007	0.003	0.004	0.004
548020	4179800	0.003	0.007	0.003	0.006	0.003	0.004	0.004
548060	4179660	0.003	0.007	0.003	0.006	0.003	0.003	0.003
548080	4179660	0.003	0.007	0.003	0.006	0.003	0.003	0.003
548100	4179680	0.003	0.007	0.003	0.006	0.003	0.003	0.003
548080	4179740	0.003	0.007	0.003	0.006	0.003	0.003	0.003
547980	4179640	0.003	0.006	0.003	0.006	0.003	0.003	0.003
547960	4179820	0.003	0.006	0.003	0.006	0.003	0.003	0.003
547940	4179820	0.003	0.006	0.003	0.006	0.003	0.003	0.003
548000	4179640	0.003	0.006	0.003	0.006	0.003	0.003	0.003
547980	4179820	0.003	0.006	0.003	0.006	0.003	0.003	0.003
548060	4179780	0.003	0.006	0.003	0.006	0.003	0.003	0.003
548100	4179700	0.003	0.006	0.003	0.006	0.003	0.003	0.003
548080	4179760	0.003	0.006	0.003	0.006	0.003	0.003	0.003
548100	4179660	0.003	0.006	0.003	0.006	0.003	0.003	0.003
548100	4179720	0.003	0.006	0.003	0.006	0.003	0.003	0.003
548040	4179800	0.003	0.006	0.003	0.006	0.003	0.003	0.003
548000	4179820	0.003	0.006	0.003	0.005	0.003	0.003	0.003
548020	4179640	0.003	0.006	0.003	0.005	0.003	0.003	0.003
547920	4179820	0.003	0.006	0.003	0.005	0.003	0.003	0.003

Risk Calculation Part 2

		$\sum R1*C_{DPM}$			Cancer Risk	Receptor
3rd Trimester	0<2	2<9	Total	per million	Determination
9.71E-08	3.54E-06	1.09E-06	4.72E-06	4.72	pot. res.
8.33E-08	3.04E-06	9.36E-07	4.06E-06	4.06	pot. res.
8.23E-08	3.00E-06	9.25E-07	4.01E-06	4.01	pot. res.
7.95E-08	2.90E-06	8.93E-07	3.87E-06	3.87	pot. res.
7.85E-08	2.86E-06	8.82E-07	3.82E-06	3.82	pot. res.
7.65E-08	2.79E-06	8.60E-07	3.72E-06	3.72	pot. res.
7.52E-08	2.74E-06	8.45E-07	3.66E-06	3.66	pot. res.
7.20E-08	2.62E-06	8.09E-07	3.51E-06	3.51	pot. res.
7.13E-08	2.60E-06	8.01E-07	3.47E-06	3.47	pot. res.
6.84E-08	2.49E-06	7.69E-07	3.33E-06	3.33	pot. res.
6.65E-08	2.42E-06	7.48E-07	3.24E-06	3.24	pot. res.
6.61E-08	2.41E-06	7.44E-07	3.22E-06	3.22	pot. res.
6.49E-08	2.36E-06	7.29E-07	3.16E-06	3.16	pot. res.
6.36E-08	2.32E-06	7.16E-07	3.10E-06	3.10	pot. res.
6.33E-08	2.31E-06	7.12E-07	3.08E-06	3.08	pot. res.
6.22E-08	2.27E-06	7.00E-07	3.03E-06	3.03	pot. res.
6.18E-08	2.25E-06	6.95E-07	3.01E-06	3.01	pot. res.
6.18E-08	2.25E-06	6.95E-07	3.01E-06	3.01	pot. res.
6.12E-08	2.24E-06	6.92E-07	2.99E-06	2.99	pot. res.
6.13E-08	2.23E-06	6.89E-07	2.98E-06	2.98	pot. res.
6.06E-08	2.21E-06	6.82E-07	2.95E-06	2.95	pot. res.
6.04E-08	2.20E-06	6.80E-07	2.94E-06	2.94	pot. res.
6.04E-08	2.20E-06	6.80E-07	2.94E-06	2.94	pot. res.
5.91E-08	2.15E-06	6.65E-07	2.88E-06	2.88	pot. res.
5.88E-08	2.14E-06	6.61E-07	2.86E-06	2.86	pot. res.
5.74E-08	2.09E-06	6.45E-07	2.79E-06	2.79	pot. res.
5.69E-08	2.08E-06	6.41E-07	2.77E-06	2.77	pot. res.
5.56E-08	2.03E-06	6.26E-07	2.71E-06	2.71	pot. res.
5.56E-08	2.03E-06	6.25E-07	2.71E-06	2.71	pot. res.
5.50E-08	2.01E-06	6.19E-07	2.68E-06	2.68	pot. res.
5.32E-08	1.94E-06	5.98E-07	2.59E-06	2.59	pot. res.
5.30E-08	1.93E-06	5.97E-07	2.58E-06	2.58	pot. res.
5.22E-08	1.90E-06	5.87E-07	2.54E-06	2.54	pot. res.
5.19E-08	1.89E-06	5.84E-07	2.53E-06	2.53	pot. res.
5.08E-08	1.85E-06	5.72E-07	2.48E-06	2.48	pot. res.
5.03E-08	1.83E-06	5.66E-07	2.45E-06	2.45	pot. res.
4.96E-08	1.81E-06	5.58E-07	2.42E-06	2.42	pot. res.
4.71E-08	1.72E-06	5.30E-07	2.29E-06	2.29	pot. res.
4.69E-08	1.71E-06	5.28E-07	2.28E-06	2.28	pot. res.
4.64E-08	1.69E-06	5.22E-07	2.26E-06	2.26	pot. res.
4.63E-08	1.69E-06	5.21E-07	2.26E-06	2.26	pot. res.
4.48E-08	1.63E-06	5.04E-07	2.18E-06	2.18	pot. res.
4.44E-08	1.62E-06	5.00E-07	2.16E-06	2.16	pot. res.
4.42E-08	1.61E-06	4.98E-07	2.15E-06	2.15	pot. res.
4.42E-08	1.61E-06	4.98E-07	2.15E-06	2.15	pot. res.
4.38E-08	1.60E-06	4.93E-07	2.13E-06	2.13	pot. res.
4.30E-08	1.57E-06	4.85E-07	2.10E-06	2.10	pot. res.
4.24E-08	1.55E-06	4.78E-07	2.07E-06	2.07	pot. res.
4.16E-08	1.52E-06	4.69E-07	2.03E-06	2.03	pot. res.
4.13E-08	1.51E-06	4.66E-07	2.01E-06	2.01	pot. res.
4.10E-08	1.49E-06	4.62E-07	2.00E-06	2.00	pot. res.
4.06E-08	1.48E-06	4.57E-07	1.98E-06	1.98	pot. res.
4.04E-08	1.47E-06	4.55E-07	1.97E-06	1.97	pot. res.
4.01E-08	1.46E-06	4.51E-07	1.95E-06	1.95	pot. res.
3.99E-08	1.46E-06	4.50E-07	1.95E-06	1.95	pot. res.
3.94E-08	1.44E-06	4.44E-07	1.92E-06	1.92	pot. res.
3.93E-08	1.43E-06	4.43E-07	1.91E-06	1.91	pot. res.
3.84E-08	1.40E-06	4.33E-07	1.87E-06	1.87	pot. res.
3.83E-08	1.40E-06	4.32E-07	1.87E-06	1.87	pot. res.
3.83E-08	1.40E-06	4.33E-07	1.87E-06	1.87	pot. res.

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Mitigated Initial Phase of Aldea Housing Densification Construction Cancer Risk Calculations for Residential Child Receptor

Haul Truck Trip Adjustment Factor to Model

	One Way (miles)					
	ISA	RAB	HDMC	IAH1	IAH2	
CalEEMod, Haul	20	20	20	20	20	*haul truck trip distance as modeled in CalEEMod*
CalEEMod, Vend	7.3	7.3	7.3	7.3	7.3	*vendor trip distance as modeled in CalEEMod*
AERMOD	0.52	0.52	0.52	0.52	0.19	
% in Dispersion Model, Haul	3%	3%	3%	3%	1%	
% in Dispersion Model, Vend	7%	7%	7%	7%	3%	

Construction Emissions, *as applied to AERMOD results*

				Days				Total Umitigated DPM (tons)				Total Umitigated DPM (g/s)			
	Year	Start Date	Stop Date	3rd Trimester	0<2	2<9	Duration	Offroad	Haul/Vend1	Haul/Vend2	Idle	Offroad	Haul1	Haul2	Idle
Initial phase of Aldea Housing Densification	2028	1/3/2028	12/31/2028	90.00	274.00	0.00	364	4.54E-03	1.96E-05	7.17E-06	2.89E-06	1.31E-04	5.67E-07	2.07E-07	8.35E-08
	2029	1/1/2029	1/11/2029	0.00	11.00	0.00	11	2.00E-05	0.00E+00	0.00E+00	0.00E+00	1.91E-05	0.00E+00	0.00E+00	0.00E+00

Risk Factors

	Abbreviation	UOM	3rd Trimester	0<2	2<9
Daily Breathing Rate (95th %'ile)	DBR	L/kg-day	361	1090	631
Fraction Of Time At Home	FAH	unitless	1	1	1
Exposure Frequency	EF	days/year	0.96	0.96	0.96
Age Sensitivity Factor	ASF	unitless	10	10	3
Inhalation Absorption Factor	A	unitless	1	1	1
Conversion Factor	CF_1	m^3/L	0.001	0.001	0.001
Conversion Factor	CF_2	$\mu g/m^3$	0.001	0.001	0.001
Cancer Potency Factor (diesel exhaust)	CPF	$mg/kg\text{-}day^{-1}$	1.1	1.1	1.1
Averaging Time (for residential exposure)	AT	years	70.00	70.00	70.00

Intake Factor for Inhalation, IF (m^3/kg-day)

	Year	Equation	3rd Trimester	0<2	2<9
Initial phase of Aldea Housing Densification	2028	DBR*FAH*EF *ED*ASF*A*	0.012	0.112	0.000
	2029	CF/AT	0.000	0.004	0.000

Risk Calculation Part 1, R1

IF*CPF*CF	1.34E-05	1.23E-04	0.00E+00
	0.00E+00	4.95E-06	0.00E+00

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

		IAH	
X (UTM)	Y (UTM	2028	2029
547980	4179080	0.033	0.005
547980	4179100	0.033	0.005
548000	4179040	0.023	0.003
548000	4179060	0.023	0.003
548000	4179100	0.023	0.003
548000	4179080	0.022	0.003
548000	4179120	0.022	0.003
548000	4179020	0.019	0.003
548000	4179140	0.015	0.002
548020	4179080	0.015	0.002
548020	4179060	0.015	0.002
548020	4179100	0.015	0.002
548020	4179040	0.014	0.002
548020	4179120	0.014	0.002
548020	4179020	0.012	0.002
548040	4179080	0.010	0.002
548040	4179060	0.010	0.002
548040	4179100	0.010	0.001
548020	4179140	0.010	0.001
548040	4179040	0.010	0.001
548040	4179120	0.009	0.001
548020	4179000	0.009	0.001
548040	4179020	0.008	0.001
548060	4179080	0.008	0.001
548060	4179060	0.007	0.001
548060	4179100	0.007	0.001
548000	4179160	0.007	0.001
548040	4179140	0.007	0.001
548060	4179040	0.007	0.001
548060	4179120	0.007	0.001
547980	4179160	0.007	0.001
548040	4179000	0.007	0.001
548020	4179160	0.006	0.001
548060	4179020	0.006	0.001
548080	4179080	0.006	0.001
548080	4179060	0.006	0.001
548060	4179140	0.006	0.001
548080	4179100	0.006	0.001
548080	4179040	0.006	0.001
548040	4179160	0.005	0.001
548080	4179120	0.005	0.001
548100	4179080	0.005	0.001
548080	4179140	0.004	0.001
548100	4179100	0.004	0.001
548060	4179160	0.004	0.001
548100	4179120	0.004	0.001
548020	4179180	0.004	0.001
548000	4179180	0.004	0.001
548080	4179160	0.004	0.001
548040	4179180	0.004	0.001
548100	4179140	0.004	0.001
548120	4179100	0.004	0.001
548120	4179120	0.003	0.000
548060	4179180	0.003	0.000
548100	4179160	0.003	0.000
548120	4179140	0.003	0.000
548080	4179180	0.003	0.000
548140	4179120	0.003	0.000
548100	4179180	0.003	0.000
548120	4179160	0.003	0.000
548140	4179140	0.003	0.000
548160	4179120	0.002	0.000
548140	4179160	0.002	0.000
548120	4179180	0.002	0.000
548080	4179200	0.002	0.000
548160	4179140	0.002	0.000
548100	4179200	0.002	0.000
548160	4179160	0.002	0.000
548180	4179140	0.002	0.000
548140	4179180	0.002	0.000
548120	4179200	0.002	0.000
548180	4179160	0.002	0.000
548080	4179220	0.002	0.000
548160	4179180	0.002	0.000
548140	4179200	0.002	0.000
548100	4179220	0.002	0.000

Risk Calculation Part 2

	$\sum_R 1*C_{DPM}$			Cancer Risk	
3rd Trimester	0<2	2<9	Total	per million	Receptor Determination
4.42E-07	4.09E-06	0.00E+00	4.53E-06	4.53	Aldea Housing Res Hall
4.42E-07	4.09E-06	0.00E+00	4.53E-06	4.53	Aldea Housing Res Hall
3.12E-07	2.88E-06	0.00E+00	3.19E-06	3.19	Aldea Housing Res Hall
3.10E-07	2.87E-06	0.00E+00	3.18E-06	3.18	Aldea Housing Res Hall
3.10E-07	2.86E-06	0.00E+00	3.17E-06	3.17	Aldea Housing Res Hall
2.99E-07	2.76E-06	0.00E+00	3.06E-06	3.06	Aldea Housing Res Hall
2.94E-07	2.72E-06	0.00E+00	3.01E-06	3.01	Aldea Housing Res Hall
2.60E-07	2.40E-06	0.00E+00	2.66E-06	2.66	Aldea Housing Res Hall
2.04E-07	1.89E-06	0.00E+00	2.09E-06	2.09	Aldea Housing Res Hall
2.01E-07	1.86E-06	0.00E+00	2.06E-06	2.06	Aldea Housing Res Hall
2.00E-07	1.85E-06	0.00E+00	2.05E-06	2.05	Aldea Housing Res Hall
1.99E-07	1.84E-06	0.00E+00	2.04E-06	2.04	Aldea Housing Res Hall
1.90E-07	1.76E-06	0.00E+00	1.94E-06	1.94	Aldea Housing Res Hall
1.86E-07	1.72E-06	0.00E+00	1.90E-06	1.90	Aldea Housing Res Hall
1.60E-07	1.48E-06	0.00E+00	1.64E-06	1.64	Aldea Housing Res Hall
1.40E-07	1.30E-06	0.00E+00	1.44E-06	1.44	Aldea Housing Res Hall
1.39E-07	1.28E-06	0.00E+00	1.42E-06	1.42	Aldea Housing Res Hall
1.37E-07	1.27E-06	0.00E+00	1.41E-06	1.41	Aldea Housing Res Hall
1.37E-07	1.27E-06	0.00E+00	1.40E-06	1.40	Aldea Housing Res Hall
1.29E-07	1.19E-06	0.00E+00	1.32E-06	1.32	Aldea Housing Res Hall
1.23E-07	1.14E-06	0.00E+00	1.26E-06	1.26	Aldea Housing Res Hall
1.18E-07	1.09E-06	0.00E+00	1.20E-06	1.20	Aldea Housing Res Hall
1.11E-07	1.03E-06	0.00E+00	1.14E-06	1.14	Aldea Housing Res Hall
1.04E-07	9.60E-07	0.00E+00	1.06E-06	1.06	Aldea Housing Res Hall
9.99E-08	9.24E-07	0.00E+00	1.02E-06	1.02	Aldea Housing Res Hall
9.99E-08	9.24E-07	0.00E+00	1.02E-06	1.02	Aldea Housing Res Hall
9.61E-08	8.89E-07	0.00E+00	9.85E-07	0.98	Aldea Housing Res Hall
9.53E-08	8.81E-07	0.00E+00	9.77E-07	0.98	Aldea Housing Res Hall
9.50E-08	8.78E-07	0.00E+00	9.73E-07	0.97	Aldea Housing Res Hall
9.29E-08	8.59E-07	0.00E+00	9.51E-07	0.95	Aldea Housing Res Hall
8.84E-08	8.17E-07	0.00E+00	9.05E-07	0.91	Aldea Housing Res Hall
8.79E-08	8.13E-07	0.00E+00	9.01E-07	0.90	Aldea Housing Res Hall
8.64E-08	7.99E-07	0.00E+00	8.86E-07	0.89	Aldea Housing Res Hall
8.42E-08	7.79E-07	0.00E+00	8.63E-07	0.86	Aldea Housing Res Hall
7.80E-08	7.21E-07	0.00E+00	7.99E-07	0.80	Aldea Housing Res Hall
7.76E-08	7.18E-07	0.00E+00	7.95E-07	0.80	Aldea Housing Res Hall
7.58E-08	7.01E-07	0.00E+00	7.76E-07	0.78	Aldea Housing Res Hall
7.42E-08	6.86E-07	0.00E+00	7.60E-07	0.76	Aldea Housing Res Hall
7.42E-08	6.86E-07	0.00E+00	7.60E-07	0.76	Aldea Housing Res Hall
7.12E-08	6.58E-07	0.00E+00	7.29E-07	0.73	Aldea Housing Res Hall
6.94E-08	6.42E-07	0.00E+00	7.11E-07	0.71	Aldea Housing Res Hall
6.21E-08	5.74E-07	0.00E+00	6.36E-07	0.64	Aldea Housing Res Hall
6.01E-08	5.55E-07	0.00E+00	6.15E-07	0.62	Aldea Housing Res Hall
5.89E-08	5.45E-07	0.00E+00	6.04E-07	0.60	Aldea Housing Res Hall
5.85E-08	5.41E-07	0.00E+00	6.00E-07	0.60	Aldea Housing Res Hall
5.44E-08	5.03E-07	0.00E+00	5.58E-07	0.56	Aldea Housing Res Hall
5.23E-08	4.84E-07	0.00E+00	5.36E-07	0.54	Aldea Housing Res Hall
5.13E-08	4.75E-07	0.00E+00	5.26E-07	0.53	Aldea Housing Res Hall
5.00E-08	4.62E-07	0.00E+00	5.12E-07	0.51	Aldea Housing Res Hall
4.97E-08	4.60E-07	0.00E+00	5.09E-07	0.51	Aldea Housing Res Hall
4.93E-08	4.56E-07	0.00E+00	5.05E-07	0.51	Aldea Housing Res Hall
4.88E-08	4.51E-07	0.00E+00	5.00E-07	0.50	Aldea Housing Res Hall
4.55E-08	4.21E-07	0.00E+00	4.66E-07	0.47	Aldea Housing Res Hall
4.50E-08	4.17E-07	0.00E+00	4.62E-07	0.46	Aldea Housing Res Hall
4.23E-08	3.91E-07	0.00E+00	4.33E-07	0.43	Aldea Housing Res Hall
4.06E-08	3.75E-07	0.00E+00	4.16E-07	0.42	Aldea Housing Res Hall
3.92E-08	3.62E-07	0.00E+00	4.02E-07	0.40	Aldea Housing Res Hall
3.78E-08	3.49E-07	0.00E+00	3.87E-07	0.39	Aldea Housing Res Hall
3.54E-08	3.27E-07	0.00E+00	3.63E-07	0.36	Aldea Housing Res Hall
3.49E-08	3.23E-07	0.00E+00	3.58E-07	0.36	Aldea Housing Res Hall
3.43E-08	3.17E-07	0.00E+00	3.51E-07	0.35	Aldea Housing Res Hall
3.24E-08	2.99E-07	0.00E+00	3.32E-07	0.33	Aldea Housing Res Hall
3.05E-08	2.82E-07	0.00E+00	3.12E-07	0.31	Aldea Housing Res Hall
3.04E-08	2.81E-07	0.00E+00	3.11E-07	0.31	Aldea Housing Res Hall
3.01E-08	2.78E-07	0.00E+00	3.08E-07	0.31	Aldea Housing Res Hall
2.96E-08	2.74E-07	0.00E+00	3.04E-07	0.30	Aldea Housing Res Hall
2.82E-08	2.61E-07	0.00E+00	2.89E-07	0.29	Aldea Housing Res Hall
2.73E-08	2.53E-07	0.00E+00	2.80E-07	0.28	Aldea Housing Res Hall
2.69E-08	2.48E-07	0.00E+00	2.75E-07	0.28	Aldea Housing Res Hall
2.68E-08	2.48E-07	0.00E+00	2.75E-07	0.27	Aldea Housing Res Hall
2.54E-08	2.35E-07	0.00E+00	2.61E-07	0.26	Aldea Housing Res Hall
2.41E-08	2.23E-07	0.00E+00	2.47E-07	0.25	Aldea Housing Res Hall
2.34E-08	2.16E-07	0.00E+00	2.40E-07	0.24	Aldea Housing Res Hall
2.32E-08	2.15E-07	0.00E+00	2.38E-07	0.24	Aldea Housing Res Hall
2.22E-08	2.05E-07	0.00E+00	2.27E-07	0.23	Aldea Housing Res Hall
2.21E-08	2.05E-07	0.00E+00	2.27E-07	0.23	Aldea Housing Res Hall

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Mitigated Construction Hazard Index Calculations for Residential Child Receptor

Haul Truck Trip Adjustment Factor to Model

	One Way (miles)				
	ISA	RAB	HDMC	IAH1	IAH2
CalEEMod, Haul	20	20	20	20	20
CalEEMod, Vend	7.3	7.3	7.3	7.3	7.3
AERMOD	0.52	0.52	0.52	0.52	0.19
% in Dispersion Model, Haul	3%	3%	3%	3%	1%
% in Dispersion Model, Vend	7%	7%	7%	7%	3%

haul truck trip distance as modeled in CalEEMod

vendor trip distance as modeled in CalEEMod

HI DPM: 5

Construction Emissions, *as applied to AERMOD results*

				Total Mitigated DPM (tons)				Total Mitigated DPM (g/s)			
	Year	Start Date	Stop Date	Offroad	Haul/Vend1	Haul/Vend2	Idle	Offroad	Haul1	Haul2	Idle
Irving Street Arrival	2022	3/1/2022	12/31/2022	2.40E-03	5.74E-06	--	1.77E-06	6.90E-05	1.65E-07	--	5.09E-08
	2023	1/1/2023	11/30/2023	2.24E-03	4.29E-06	--	0.00E+00	6.44E-05	1.24E-07	--	0.00E+00
Research and Academic Building	2022	3/1/2022	12/31/2022	6.63E-03	1.08E-04	--	6.40E-05	1.91E-04	3.10E-06	--	1.84E-06
	2023	1/1/2023	12/31/2023	4.57E-03	5.30E-05	--	0.00E+00	1.31E-04	1.52E-06	--	0.00E+00
	2024	1/1/2024	12/31/2024	5.13E-03	5.08E-05	--	0.00E+00	1.48E-04	1.46E-06	--	0.00E+00
	2025	1/1/2025	12/31/2025	5.11E-03	4.87E-05	--	0.00E+00	1.47E-04	1.40E-06	--	0.00E+00
New Hospital	2023	6/1/2023	12/31/2023	2.85E-03	0.00E+00	--	0.00E+00	8.20E-05	0.00E+00	--	0.00E+00
	2024	1/1/2024	12/31/2024	9.67E-03	9.48E-05	--	8.89E-05	2.78E-04	2.73E-06	--	2.56E-06
	2025	1/1/2025	12/31/2025	4.59E-03	1.74E-04	--	0.00E+00	1.32E-04	5.00E-06	--	0.00E+00
	2026	1/1/2026	12/31/2026	9.18E-03	3.32E-04	--	0.00E+00	2.64E-04	9.55E-06	--	0.00E+00
	2027	1/1/2027	12/31/2027	4.59E-03	1.59E-04	--	0.00E+00	1.32E-04	4.57E-06	--	0.00E+00
	2028	1/1/2028	12/31/2028	5.09E-03	1.52E-04	--	0.00E+00	1.46E-04	4.36E-06	--	0.00E+00
	2029	1/1/2029	12/31/2029	5.11E-03	1.46E-04	--	0.00E+00	1.47E-04	4.20E-06	--	0.00E+00
Initial phase of Aldea Housing Densification	2028	1/3/2028	12/31/2028	4.54E-03	1.96E-05	7.17E-06	2.89E-06	1.31E-04	5.65E-07	2.06E-07	8.33E-08
	2029	1/1/2029	1/11/2029	2.00E-05	0.00E+00	0.00E+00	0.00E+00	5.75E-07	0.00E+00	0.00E+00	0.00E+00

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

By project

		ISA		RAB				HDMC							IAH		ISA	RAB	HDMC	IAH
X (UTM)	Y (UTM	2022	2023	2022	2023	2024	2025	2023	2024	2025	2026	2027	2028	2029	2028	2029				
547560	4179660	0.001	0.000	0.009	0.006	0.007	0.007	0.000	0.001	0.001	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.002	0.000	0.000
547520	4179640	0.000	0.000	0.009	0.006	0.007	0.007	0.000	0.001	0.001	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.002	0.000	0.000
547540	4179660	0.000	0.000	0.007	0.005	0.005	0.005	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000
547500	4179640	0.000	0.000	0.006	0.004	0.005	0.005	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000
547440	4179580	0.000	0.000	0.005	0.004	0.004	0.004	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000
547560	4179680	0.001	0.001	0.005	0.004	0.004	0.004	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000
547520	4179660	0.000	0.000	0.005	0.004	0.004	0.004	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000
547460	4179620	0.000	0.000	0.005	0.003	0.004	0.004	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000
547440	4179540	0.000	0.000	0.005	0.003	0.004	0.004	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
547480	4179640	0.000	0.000	0.005	0.003	0.004	0.004	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000
547860	4179780	0.004	0.004	0.002	0.001	0.001	0.001	0.003	0.009	0.004	0.009	0.004	0.005	0.005	0.000	0.000	0.001	0.000	0.002	0.000
547860	4179800	0.004	0.004	0.001	0.001	0.001	0.001	0.002	0.006	0.003	0.005	0.003	0.003	0.003	0.000	0.000	0.001	0.000	0.001	0.000
547980	4179760	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.015	0.007	0.014	0.007	0.008	0.008	0.000	0.000	0.000	0.000	0.003	0.000
547740	4179820	0.005	0.005	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.000
547860	4179820	0.004	0.003	0.001	0.001	0.001	0.001	0.001	0.004	0.002	0.004	0.002	0.002	0.002	0.000	0.000	0.001	0.000	0.001	0.000
547980	4179780	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.011	0.005	0.011	0.005	0.006	0.006	0.000	0.000	0.000	0.000	0.002	0.000
548000	4179760	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.012	0.006	0.011	0.006	0.006	0.006	0.000	0.000	0.000	0.000	0.002	0.000
547980	4179720	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.013	0.006	0.012	0.006	0.007	0.007	0.000	0.000	0.000	0.000	0.003	0.000
547980	4179740	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.012	0.006	0.011	0.006	0.006	0.006	0.000	0.000	0.000	0.000	0.002	0.000
547980	4179700	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.012	0.006	0.012	0.006	0.006	0.006	0.000	0.000	0.000	0.000	0.002	0.000
547980	4179680	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.011	0.005	0.011	0.005	0.006	0.006	0.000	0.000	0.000	0.000	0.002	0.000
548000	4179720	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.011	0.005	0.010	0.005	0.006	0.006	0.000	0.000	0.000	0.000	0.002	0.000
548000	4179700	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.011	0.005	0.010	0.005	0.006	0.006	0.000	0.000	0.000	0.000	0.002	0.000
548000	4179740	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.010	0.005	0.010	0.005	0.005	0.005	0.000	0.000	0.000	0.000	0.002	0.000
547860	4179840	0.003	0.003	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.003	0.001	0.001	0.001	0.000	0.000	0.001	0.000	0.001	0.000
547760	4179840	0.003	0.003	0.001	0.001	0.001	0.001	0.000	0.002	0.001	0.002	0.001	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.000
547700	4179820	0.003	0.002	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.000
547840	4179860	0.003	0.003	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.000
547740	4179840	0.003	0.002	0.001	0.001	0.001	0.001	0.000	0.002	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.000
547860	4179860	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.000
547980	4179100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.000	0.000	0.000	0.000	0.007
547980	4179080	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.000	0.000	0.000	0.000	0.007
548000	4179100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.000	0.000	0.000	0.000	0.005
548000	4179060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.000	0.000	0.000	0.000	0.005
548000	4179120	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.000	0.000	0.000	0.000	0.004
548000	4179040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.000	0.000	0.000	0.000	0.005
548000	4179080	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.000	0.000	0.000	0.000	0.004
548000	4179020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.000	0.000	0.000	0.000	0.004
548000	4179140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.000	0.000	0.000	0.000	0.003
548020	4179080	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.000	0.000	0.000	0.000	0.003
547440	4179600	0.000	0.000	0.005	0.003	0.004	0.004	0.000	0.001	0.001	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000
547540	4179680	0.001	0.000	0.004	0.003	0.003	0.003	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000
547500	4179660	0.000	0.000	0.004	0.003	0.003	0.003	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.001	0.000	0.000
547440	4179520	0.000	0.000	0.004	0.003	0.003	0.003	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000

UCSF Parnassus Heights LRDP
Initial Phase of LRDP (2030)
Mitigated Construction Cancer Risk Calculations for Daycare and School Receptors
Solver was used to maximize the exposure

Haul Truck Trip Adjustment Factor to Model

	One Way (miles)					
	ISA	RAB	HDMC	IAH1	IAH2	
CalEEMod, Haul	20	20	20	20	20	*haul truck trip distance as modeled in CalEEMod*
CalEEMod, Vend	7.3	7.3	7.3	7.3	7.3	*vendor trip distance as modeled in CalEEMod*
AERMOD	0.52	0.52	0.52	0.52	0.19	
% in Dispersion Model, Haul	3%	3%	3%	3%	1%	
% in Dispersion Model, Vend	7%	7%	7%	7%	3%	

Construction Emissions, *as represented in AERMOD*

					Total Mitigated DPM (tons)				Total Mitigated DPM (g/s)			
	Year	Start Date	Stop Date	Duration (Days)	Offroad	Haul/Vend1	Haul/Vend2	Idle	Offroad	Haul1	Haul2	Idle
Irving Street Arrival	2022	3/1/2022	12/31/2022	306	2.40E-03	5.74E-06	--	1.77E-06	8.24E-05	1.97E-07	--	6.07E-08
	2023	1/1/2023	11/30/2023	334	2.24E-03	4.29E-06	--	0.00E+00	7.04E-05	1.35E-07	--	0.00E+00
Research and Academic Building	2022	3/1/2022	12/31/2022	306	6.63E-03	1.08E-04	--	6.40E-05	2.27E-04	3.70E-06	--	2.20E-06
	2023	1/1/2023	12/31/2023	365	4.57E-03	5.30E-05	--	0.00E+00	1.31E-04	1.52E-06	--	0.00E+00
	2024	1/1/2024	12/31/2024	366	5.13E-03	5.08E-05	--	0.00E+00	1.47E-04	1.46E-06	--	0.00E+00
	2025	1/1/2025	12/31/2025	365	5.11E-03	4.87E-05	--	0.00E+00	1.47E-04	1.40E-06	--	0.00E+00
New Hospital	2023	6/1/2023	12/31/2023	214	2.85E-03	0.00E+00	--	0.00E+00	1.40E-04	0.00E+00	--	0.00E+00
	2024	1/1/2024	12/31/2024	366	9.67E-03	9.48E-05	--	8.89E-05	2.77E-04	2.72E-06	--	2.55E-06
	2025	1/1/2025	12/31/2025	365	4.59E-03	1.74E-04	--	0.00E+00	1.32E-04	5.00E-06	--	0.00E+00
	2026	1/1/2026	12/31/2026	365	9.18E-03	3.32E-04	--	0.00E+00	2.64E-04	9.55E-06	--	0.00E+00
	2027	1/1/2027	12/31/2027	365	4.59E-03	1.59E-04	--	0.00E+00	1.32E-04	4.57E-06	--	0.00E+00
	2028	1/1/2028	12/31/2028	366	5.09E-03	1.52E-04	--	0.00E+00	1.46E-04	4.35E-06	--	0.00E+00
	2029	1/1/2029	12/31/2029	365	5.11E-03	1.46E-04	--	0.00E+00	1.47E-04	4.20E-06	--	0.00E+00
Initial phase of Aldea Housing Densification	2028	1/3/2028	12/31/2028	364	4.54E-03	1.96E-05	7.17E-06	2.89E-06	1.31E-04	5.67E-07	2.07E-07	8.35E-08
	2029	1/1/2029	1/11/2029	11	2.00E-05	0.00E+00	0.00E+00	0.00E+00	1.91E-05	0.00E+00	0.00E+00	0.00E+00

		Daycare1		Daycare2		Daycare3		School1	School2	School3	School4
Name		Lucia Child Care Center		ABC Bay Area Child Care		Kirkham Child Care Center		Clarendon Alternative Elementary	Independence High	Stepping Stones Preschool	Haight Ashbury Community Nursery School
Max Exposure (years)		5		5		5		7	5	4	4
Exposure Duration	Year	0<2	2<9	0<2	2<9	0<2	2<9	2<16	2<16	2<16	2<16
Irving Street Arrival	2022	306.00	0.00	306.00	0.00	306.00	0.00	306.00	306.00	306.00	306.00
	2023	334.00	0.00	334.00	0.00	334.00	0.00	334.00	334.00	334.00	334.00
Research and Academic Building	2022	306.00	0.00	306.00	0.00	306.00	0.00	306.00	306.00	306.00	306.00
	2023	365.00	0.00	365.00	0.00	365.00	0.00	365.00	365.00	365.00	365.00
	2024	59.00	307.00	59.00	307.00	59.00	307.00	366.00	366.00	366.00	366.00
	2025	0.00	365.00	0.00	365.00	0.00	365.00	365.00	365.00	365.00	365.00
New Hospital	2023	214.00	0.00	214.00	0.00	214.00	0.00	214.00	214.00	214.00	214.00
	2024	366.00	0.00	366.00	0.00	366.00	0.00	366.00	366.00	366.00	366.00
	2025	180.00	185.00	180.00	185.00	180.00	185.00	365.00	365.00	365.00	365.00
	2026	0.00	365.00	0.00	365.00	0.00	365.00	365.00	365.00	365.00	365.00
	2027	0.00	365.00	0.00	365.00	0.00	365.00	365.00	365.00	151.00	151.00
	2028	0.00	181.00	0.00	181.00	0.00	181.00	366.00	151.00	0.00	0.00
	2029	0.00	0.00	0.00	0.00	0.00	0.00	365.00	0.00	0.00	0.00
Initial phase of Aldea Housing Densification	2028	364.00	0.00	364.00	0.00	364.00	0.00	364.00	364.00	364.00	364.00
	2029	11.00	0.00	11.00	0.00	11.00	0.00	11.00	11.00	11.00	11.00
		730.00	1096.0	730	1096	730	1096	2556.00	1826.00	1461	1461.00

Risk Factors

			Daycare		School
	Abbreviation	UOM	0<2	2<9	2<16
8HR Breathing Rate (95th %'ile, moderate intensity)	BR	L/kg-day	1200	640	520
Fraction Of Time At Home	FAH	unitless	0.33	0.33	0.33
Exposure Frequency	EF	days/year	0.68	0.68	0.49
Age Sensitivity Factor	ASF	unitless	10	3	3
Inhalation Absorption Factor	A	unitless	1	1	1
Modeling Adjustment Factor	MAF	unitless	1.4	1.4	1.4
Conversion Factor	CF_1	m^3/L	0.001	0.001	0.001
Conversion Factor	CF_2	$\mu g/m^3$	0.001	0.001	0.001
Cancer Potency Factor (diesel exhaust)	CPF	$mg/kg\text{-}day^{-1}$	1.1	1.1	1.1
Averaging Time (for residential exposure)	AT	years	70.00	70.00	70.00

Intake Factor for Inhalation, IF (m^3/kg-day)

			Daycare1		Daycare2		Daycare3		School1	School2	School3	School4
	Year	Equation	0<2	2<9	0<2	2<9	0<2	2<9	2<16	2<16	2<16	2<16
Irving Street Arrival	2022		0.045	0.000	0.045	0.000	0.045	0.000	0.004	0.004	0.004	0.004
	2023		0.050	0.000	0.050	0.000	0.050	0.000	0.005	0.005	0.005	0.005
Research and Academic Building	2022		0.045	0.000	0.045	0.000	0.045	0.000	0.004	0.004	0.004	0.004
	2023		0.054	0.000	0.054	0.000	0.054	0.000	0.005	0.005	0.005	0.005
	2024		0.009	0.007	0.009	0.007	0.009	0.007	0.005	0.005	0.005	0.005
	2025		0.000	0.009	0.000	0.009	0.000	0.009	0.005	0.005	0.005	0.005
New Hospital	2023	BR*FAH*EF*	0.032	0.000	0.032	0.000	0.032	0.000	0.003	0.003	0.003	0.003
	2024	ED*ASF*A*	0.054	0.000	0.054	0.000	0.054	0.000	0.005	0.005	0.005	0.005
	2025	MAF*CF/AT	0.027	0.004	0.027	0.004	0.027	0.004	0.005	0.005	0.005	0.005
	2026		0.000	0.009	0.000	0.009	0.000	0.009	0.005	0.005	0.005	0.005
	2027		0.000	0.009	0.000	0.009	0.000	0.009	0.005	0.005	0.002	0.002
	2028		0.000	0.004	0.000	0.004	0.000	0.004	0.005	0.002	0.000	0.000
	2029		0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000
Initial phase of Aldea Housing Densification	2028		0.054	0.000	0.054	0.000	0.054	0.000	0.005	0.005	0.005	0.005

	2029		0.002	0.000	0.002	0.000	0.002	0.000	0.000	0.000	0.000	0.000

Risk Calculation Part 1, R1

			Daycare1		Daycare2		Daycare3		School1	School2	School3	School4
	Year	Equation	0<2	2<9	0<2	2<9	0<2	2<9	2<16	2<16	2<16	2<16
Irving Street Arrival	2022		5.00E-05	0.00E+00	5.00E-05	0.00E+00	5.00E-05	0.00E+00	4.68E-06	4.68E-06	4.68E-06	4.68E-06
	2023		5.46E-05	0.00E+00	5.46E-05	0.00E+00	5.46E-05	0.00E+00	5.11E-06	5.11E-06	5.11E-06	5.11E-06
Research and Academic Building	2022		5.00E-05	0.00E+00	5.00E-05	0.00E+00	5.00E-05	0.00E+00	4.68E-06	4.68E-06	4.68E-06	4.68E-06
	2023		5.97E-05	0.00E+00	5.97E-05	0.00E+00	5.97E-05	0.00E+00	5.59E-06	5.59E-06	5.59E-06	5.59E-06
	2024		9.65E-06	8.03E-06	9.65E-06	8.03E-06	9.65E-06	8.03E-06	5.60E-06	5.60E-06	5.60E-06	5.60E-06
	2025		0.00E+00	9.55E-06	0.00E+00	9.55E-06	0.00E+00	9.55E-06	5.59E-06	5.59E-06	5.59E-06	5.59E-06
New Hospital	2023		3.50E-05	0.00E+00	3.50E-05	0.00E+00	3.50E-05	0.00E+00	3.27E-06	3.27E-06	3.27E-06	3.27E-06
	2024	IF*CPF*CF	5.98E-05	0.00E+00	5.98E-05	0.00E+00	5.98E-05	0.00E+00	5.60E-06	5.60E-06	5.60E-06	5.60E-06
	2025		2.94E-05	4.84E-06	2.94E-05	4.84E-06	2.94E-05	4.84E-06	5.59E-06	5.59E-06	5.59E-06	5.59E-06
	2026		0.00E+00	9.55E-06	0.00E+00	9.55E-06	0.00E+00	9.55E-06	5.59E-06	5.59E-06	5.59E-06	5.59E-06
	2027		0.00E+00	9.55E-06	0.00E+00	9.55E-06	0.00E+00	9.55E-06	5.59E-06	5.59E-06	2.31E-06	2.31E-06
	2028		0.00E+00	4.73E-06	0.00E+00	4.73E-06	0.00E+00	4.73E-06	5.60E-06	2.31E-06	0.00E+00	0.00E+00
	2029		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.59E-06	0.00E+00	0.00E+00	0.00E+00
Initial phase of Aldea Housing Densification	2028		5.95E-05	0.00E+00	5.95E-05	0.00E+00	5.95E-05	0.00E+00	5.57E-06	5.57E-06	5.57E-06	5.57E-06
	2029		1.80E-06	0.00E+00	1.80E-06	0.00E+00	1.80E-06	0.00E+00	1.68E-07	1.68E-07	1.68E-07	1.68E-07

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

		ISA		RAB				HDMC							IAH	
X (UTM)	Y (UTM	2022	2023	2022	2023	2024	2025	2023	2024	2025	2026	2027	2028	2029	2028	2029
547880	4178580	8.96E-06	7.65E-06	3.28E-05	1.87E-05	2.09E-05	2.09E-05	2.11E-05	4.25E-05	2.05E-05	4.09E-05	2.04E-05	2.25E-05	2.27E-05	1.31E-04	1.76E-05
547900	4178580	8.82E-06	7.54E-06	3.21E-05	1.83E-05	2.04E-05	2.04E-05	2.06E-05	4.16E-05	2.01E-05	4.01E-05	2.00E-05	2.20E-05	2.22E-05	1.34E-04	1.73E-05
547920	4178580	8.75E-06	7.47E-06	3.21E-05	1.83E-05	2.05E-05	2.05E-05	2.06E-05	4.16E-05	2.01E-05	4.01E-05	2.00E-05	2.21E-05	2.22E-05	1.47E-04	1.70E-05
547860	4178600	9.24E-06	7.89E-06	3.33E-05	1.90E-05	2.12E-05	2.12E-05	2.14E-05	4.32E-05	2.08E-05	4.16E-05	2.08E-05	2.29E-05	2.30E-05	1.40E-04	1.94E-05
547880	4178600	9.11E-06	7.78E-06	3.26E-05	1.86E-05	2.08E-05	2.07E-05	2.09E-05	4.23E-05	2.04E-05	4.08E-05	2.04E-05	2.24E-05	2.25E-05	1.40E-04	1.91E-05
547900	4178600	8.96E-06	7.65E-06	3.17E-05	1.81E-05	2.02E-05	2.02E-05	2.04E-05	4.12E-05	1.99E-05	3.97E-05	1.98E-05	2.18E-05	2.19E-05	1.42E-04	1.89E-05
547920	4178600	8.88E-06	7.58E-06	3.19E-05	1.82E-05	2.03E-05	2.03E-05	2.04E-05	4.13E-05	1.99E-05	3.98E-05	1.99E-05	2.19E-05	2.20E-05	1.48E-04	1.85E-05
547880	4178620	9.31E-06	7.95E-06	3.29E-05	1.88E-05	2.10E-05	2.10E-05	2.12E-05	4.27E-05	2.06E-05	4.12E-05	2.06E-05	2.27E-05	2.28E-05	1.51E-04	2.09E-05
547900	4178620	9.19E-06	7.85E-06	3.25E-05	1.85E-05	2.07E-05	2.07E-05	2.09E-05	4.22E-05	2.04E-05	4.07E-05	2.03E-05	2.24E-05	2.25E-05	1.52E-04	2.05E-05
547880	4178640	9.56E-06	8.16E-06	3.38E-05	1.93E-05	2.16E-05	2.15E-05	2.17E-05	4.39E-05	2.12E-05	4.23E-05	2.11E-05	2.33E-05	2.34E-05	1.64E-04	2.28E-05
547900	4178640	9.43E-06	8.06E-06	3.34E-05	1.91E-05	2.13E-05	2.13E-05	2.15E-05	4.33E-05	2.09E-05	4.18E-05	2.09E-05	2.30E-05	2.31E-05	1.63E-04	2.24E-05
547920	4178640	9.31E-06	7.95E-06	3.31E-05	1.89E-05	2.11E-05	2.11E-05	2.12E-05	4.28E-05	2.07E-05	4.13E-05	2.06E-05	2.27E-05	2.29E-05	1.64E-04	2.19E-05
547880	4178660	9.79E-06	8.36E-06	3.44E-05	1.96E-05	2.19E-05	2.19E-05	2.21E-05	4.46E-05	2.15E-05	4.30E-05	2.15E-05	2.37E-05	2.38E-05	1.79E-04	2.50E-05
547900	4178660	9.64E-06	8.24E-06	3.37E-05	1.92E-05	2.15E-05	2.15E-05	2.16E-05	4.37E-05	2.11E-05	4.22E-05	2.11E-05	2.32E-05	2.33E-05	1.78E-04	2.46E-05
547920	4178660	9.51E-06	8.12E-06	3.33E-05	1.90E-05	2.12E-05	2.11E-05	2.13E-05	4.30E-05	2.08E-05	4.15E-05	2.07E-05	2.28E-05	2.29E-05	1.78E-04	2.41E-05
547900	4178680	9.88E-06	8.44E-06	3.43E-05	1.96E-05	2.19E-05	2.18E-05	2.20E-05	4.44E-05	2.15E-05	4.29E-05	2.14E-05	2.36E-05	2.37E-05	1.95E-04	2.72E-05
547920	4178680	9.74E-06	8.32E-06	3.39E-05	1.93E-05	2.16E-05	2.16E-05	2.17E-05	4.38E-05	2.12E-05	4.22E-05	2.11E-05	2.32E-05	2.34E-05	1.94E-04	2.66E-05
547940	4178680	9.61E-06	8.20E-06	3.35E-05	1.91E-05	2.13E-05	2.13E-05	2.13E-05	4.31E-05	2.08E-05	4.16E-05	2.08E-05	2.29E-05	2.30E-05	1.96E-04	2.61E-05
547220	4179660	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
547240	4179660	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
547220	4179680	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
547240	4179680	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
547160	4179700	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
547180	4179700	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
547160	4179720	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
547180	4179720	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
548260	4179620	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.000	0.000
548280	4179620	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.000	0.000
548260	4179640	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.000	0.000
548280	4179640	0.000	0.000	0.001	0.000	0.000	0.000	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.000	0.000

Risk Calculation Part 2

R1*∑C_{DPM}			
ISA	RAB	HDMC	IAH	
8.11E-05	4.91E-04	1.02E-03	7.30E-04	Clarendon Alternative Elementary
7.98E-05	4.80E-04	9.95E-04	7.47E-04	Clarendon Alternative Elementary
7.92E-05	4.82E-04	9.97E-04	8.22E-04	Clarendon Alternative Elementary
8.36E-05	4.98E-04	1.03E-03	7.84E-04	Clarendon Alternative Elementary
8.24E-05	4.88E-04	1.01E-03	7.84E-04	Clarendon Alternative Elementary
8.10E-05	4.76E-04	9.85E-04	7.94E-04	Clarendon Alternative Elementary
8.03E-05	4.77E-04	9.88E-04	8.29E-04	Clarendon Alternative Elementary
8.42E-05	4.94E-04	1.02E-03	8.46E-04	Clarendon Alternative Elementary
8.31E-05	4.87E-04	1.01E-03	8.48E-04	Clarendon Alternative Elementary
8.65E-05	5.07E-04	1.05E-03	9.15E-04	Clarendon Alternative Elementary
8.54E-05	5.01E-04	1.04E-03	9.12E-04	Clarendon Alternative Elementary
8.43E-05	4.96E-04	1.03E-03	9.20E-04	Clarendon Alternative Elementary
8.86E-05	5.15E-04	1.07E-03	9.99E-04	Clarendon Alternative Elementary
8.73E-05	5.06E-04	1.05E-03	9.94E-04	Clarendon Alternative Elementary
8.60E-05	4.98E-04	1.03E-03	9.96E-04	Clarendon Alternative Elementary
8.94E-05	5.14E-04	1.06E-03	1.09E-03	Clarendon Alternative Elementary
8.82E-05	5.08E-04	1.05E-03	1.08E-03	Clarendon Alternative Elementary
8.69E-05	5.02E-04	1.03E-03	1.09E-03	Clarendon Alternative Elementary
1.16E-03	8.65E-03	6.67E-03	2.23E-04	Independence High
1.25E-03	9.53E-03	7.03E-03	2.29E-04	Independence High
1.14E-03	8.06E-03	6.14E-03	2.18E-04	Independence High
1.22E-03	8.84E-03	6.48E-03	2.24E-04	Independence High
9.06E-04	5.86E-03	4.14E-03	1.98E-04	Stepping Stones Preschool
9.66E-04	6.34E-03	4.36E-03	2.03E-04	Stepping Stones Preschool
8.82E-04	5.52E-03	3.91E-03	1.94E-04	Stepping Stones Preschool
9.40E-04	5.95E-03	4.11E-03	1.98E-04	Stepping Stones Preschool
3.88E-03	1.16E-02	3.50E-02	5.79E-04	Haight Ashbury Community Nursery School
3.71E-03	1.11E-02	3.25E-02	5.88E-04	Haight Ashbury Community Nursery School
4.13E-03	1.15E-02	3.61E-02	5.36E-04	Haight Ashbury Community Nursery School
3.91E-03	1.09E-02	3.33E-02	5.44E-04	Haight Ashbury Community Nursery School

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

		ISA		RAB				HDMC							IAH	
X (UTM)	Y (UTM	2022	2023	2022	2023	2024	2025	2023	2024	2025	2026	2027	2028	2029	2028	2029
547540	4179680	0.001	0.001	0.005	0.003	0.003	0.003	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000
547560	4179680	0.001	0.001	0.006	0.004	0.004	0.004	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000
547540	4179660	0.001	0.000	0.008	0.005	0.005	0.005	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000
547560	4179660	0.001	0.001	0.011	0.006	0.007	0.007	0.001	0.001	0.001	0.002	0.001	0.001	0.001	0.000	0.000
547200	4179140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
547220	4179140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
547460	4179400	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000
547480	4179400	0.000	0.000	0.001	0.001	0.001	0.001	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000

Risk Calculation Part 2

R1*∑C_{DPM}			
ISA	RAB	HDMC	IAH	
5.97E-02	5.16E-01	1.21E-01	3.46E-03	Lucia Child Care Center
6.57E-02	6.41E-01	1.39E-01	3.53E-03	Lucia Child Care Center
5.49E-02	8.41E-01	1.35E-01	3.61E-03	Lucia Child Care Center
5.93E-02	1.10E+00	1.57E-01	3.69E-03	Lucia Child Care Center
5.03E-03	2.85E-02	2.24E-02	4.18E-03	ABC Bay Area Child Care
5.16E-03	2.88E-02	2.27E-02	4.37E-03	ABC Bay Area Child Care
1.14E-02	1.49E-01	6.23E-02	5.24E-03	Kirkham Child Care Center
1.09E-02	1.48E-01	6.50E-02	5.49E-03	Kirkham Child Care Center

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Mitigated Construction Annual PM2.5 Concentration by Construction Year

Haul Truck Trip Adjustment Factor to Model

	One Way (miles)					
	ISA	RAB	HDMC	IAH1	IAH2	
CalEEMod, Haul	20	20	20	20	20	*haul truck trip distance as modeled in CalEEMod*
CalEEMod, Vend	7.3	7.3	7.3	7.3	7.3	*vendor trip distance as modeled in CalEEMod*
AERMOD	0.52	0.52	0.52	0.52	0.19	
% in Dispersion Model, Haul	3%	3%	3%	3%	1%	
% in Dispersion Model, Vend	7%	7%	7%	7%	3%	

Construction Emissions, *as applied to AERMOD results*

				Total Mitigated PM2.5 (tons)				Total Mitigated PM2.5 (g/s)			
	Year	Start Date	Stop Date	Offroad	Haul/Vend1	Haul/Vend2	Idle	Offroad	Haul1	Haul2	Idle
Irving Street Arrival	2022	3/1/2022	12/31/2022	2.40E-03	5.47E-06	--	1.69E-06	6.90E-05	1.57E-07	--	4.87E-08
	2023	1/1/2023	11/30/2023	2.24E-03	4.29E-06	--	0.00E+00	6.44E-05	1.24E-07	--	0.00E+00
Research and Academic Building	2022	3/1/2022	12/31/2022	6.63E-03	1.03E-04	--	6.12E-05	1.91E-04	2.98E-06	--	1.76E-06
	2023	1/1/2023	12/31/2023	4.57E-03	5.01E-05	--	0.00E+00	1.31E-04	1.44E-06	--	0.00E+00
	2024	1/1/2024	12/31/2024	5.13E-03	4.87E-05	--	0.00E+00	1.48E-04	1.40E-06	--	0.00E+00
	2025	1/1/2025	12/31/2025	5.11E-03	4.65E-05	--	0.00E+00	1.47E-04	1.34E-06	--	0.00E+00
New Hospital	2023	6/1/2023	12/31/2023	2.85E-03	0.00E+00	--	0.00E+00	8.20E-05	0.00E+00	--	0.00E+00
	2024	1/1/2024	12/31/2024	9.67E-03	9.06E-05	--	8.51E-05	2.78E-04	2.61E-06	--	2.45E-06
	2025	1/1/2025	12/31/2025	4.59E-03	1.67E-04	--	0.00E+00	1.32E-04	4.80E-06	--	0.00E+00
	2026	1/1/2026	12/31/2026	9.18E-03	3.18E-04	--	0.00E+00	2.64E-04	9.14E-06	--	0.00E+00
	2027	1/1/2027	12/31/2027	4.59E-03	1.52E-04	--	0.00E+00	1.32E-04	4.36E-06	--	0.00E+00
	2028	1/1/2028	12/31/2028	5.09E-03	1.45E-04	--	0.00E+00	1.46E-04	4.18E-06	--	0.00E+00
	2029	1/1/2029	12/31/2029	5.11E-03	1.40E-04	--	0.00E+00	1.47E-04	4.01E-06	--	0.00E+00
Initial phase of Aldea Housing Densification	2028	1/3/2028	12/31/2028	4.54E-03	1.87E-05	6.81E-06	2.77E-06	1.31E-04	5.37E-07	1.96E-07	7.97E-08
	2029	1/1/2029	1/11/2029	2.00E-05	0.00E+00	0.00E+00	0.00E+00	5.75E-07	0.00E+00	0.00E+00	0.00E+00

Diesel Particulate Matter concentration, C_{DPM} (ug/m^3)

Max by Project

		ISA		RAB				HDMC							IAH		ISA	RAB	HDMC	IAH
X (UTM)	Y (UTM	2022	2023	2022	2023	2024	2025	2023	2024	2025	2026	2027	2028	2029	2028	2029				
547980	4179080	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.000	0.000	0.000	0.000	0.033
547980	4179100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.000	0.000	0.000	0.000	0.033
548000	4179040	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.000	0.000	0.000	0.000	0.023
548000	4179060	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.000	0.000	0.000	0.000	0.023
548000	4179100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.000	0.000	0.000	0.000	0.023
548000	4179080	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.000	0.000	0.000	0.000	0.022
548000	4179120	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.000	0.000	0.000	0.000	0.022
547560	4179660	0.001	0.000	0.009	0.006	0.007	0.007	0.000	0.001	0.001	0.002	0.001	0.001	0.001	0.000	0.000	0.001	0.009	0.002	0.000
547520	4179640	0.000	0.000	0.009	0.006	0.007	0.007	0.000	0.001	0.001	0.002	0.001	0.001	0.001	0.000	0.000	0.000	0.009	0.002	0.000
548000	4179020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.019	0.000	0.000	0.000	0.000	0.019
547540	4179660	0.000	0.000	0.007	0.005	0.005	0.005	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.007	0.001	0.000
547980	4179760	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.015	0.007	0.014	0.007	0.008	0.008	0.000	0.000	0.001	0.001	0.015	0.000
548000	4179140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.000	0.000	0.000	0.000	0.015
548020	4179080	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.000	0.000	0.000	0.000	0.015
547500	4179640	0.000	0.000	0.006	0.004	0.005	0.005	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.006	0.001	0.000
547980	4179720	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.012	0.006	0.012	0.006	0.007	0.007	0.000	0.000	0.001	0.001	0.012	0.000
547980	4179700	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.012	0.006	0.012	0.006	0.006	0.006	0.000	0.000	0.001	0.001	0.012	0.000
548000	4179760	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.012	0.006	0.011	0.006	0.006	0.006	0.000	0.000	0.001	0.001	0.012	0.000
547980	4179740	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.012	0.006	0.011	0.006	0.006	0.006	0.000	0.000	0.001	0.001	0.012	0.000
547980	4179780	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.011	0.005	0.011	0.005	0.006	0.006	0.000	0.000	0.001	0.001	0.011	0.000
547980	4179680	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.011	0.005	0.011	0.005	0.006	0.006	0.000	0.000	0.001	0.001	0.011	0.000
547560	4179680	0.001	0.001	0.005	0.004	0.004	0.004	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.001	0.005	0.001	0.000
547520	4179660	0.000	0.000	0.005	0.004	0.004	0.004	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.005	0.001	0.000
547440	4179580	0.000	0.000	0.005	0.004	0.004	0.004	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.005	0.001	0.000
548000	4179700	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.011	0.005	0.010	0.005	0.006	0.006	0.000	0.000	0.001	0.001	0.011	0.000
548000	4179720	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.011	0.005	0.010	0.005	0.006	0.006	0.000	0.000	0.001	0.001	0.011	0.000
547460	4179620	0.000	0.000	0.005	0.003	0.004	0.004	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.005	0.001	0.000
548000	4179740	0.001	0.001	0.001	0.001	0.001	0.001	0.003	0.010	0.005	0.010	0.005	0.005	0.005	0.000	0.000	0.001	0.001	0.010	0.000
547440	4179540	0.000	0.000	0.005	0.003	0.004	0.004	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.001	0.000
547480	4179640	0.000	0.000	0.005	0.003	0.004	0.004	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.005	0.001	0.000
547860	4179780	0.004	0.004	0.002	0.001	0.001	0.001	0.003	0.009	0.004	0.009	0.004	0.005	0.005	0.000	0.000	0.004	0.002	0.009	0.000
547860	4179800	0.004	0.004	0.001	0.001	0.001	0.001	0.002	0.006	0.003	0.005	0.003	0.003	0.003	0.000	0.000	0.004	0.001	0.006	0.000
547740	4179820	0.005	0.005	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.000	0.000	0.005	0.001	0.002	0.000
547860	4179820	0.004	0.003	0.001	0.001	0.001	0.001	0.001	0.004	0.002	0.004	0.002	0.002	0.002	0.000	0.000	0.004	0.001	0.004	0.000
547760	4179840	0.003	0.003	0.001	0.001	0.001	0.001	0.000	0.002	0.001	0.002	0.001	0.001	0.001	0.000	0.000	0.003	0.001	0.002	0.000
547860	4179840	0.003	0.003	0.001	0.001	0.001	0.001	0.001	0.003	0.001	0.003	0.001	0.001	0.001	0.000	0.000	0.003	0.001	0.003	0.000
547700	4179820	0.003	0.002	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.003	0.001	0.001	0.000
547740	4179840	0.003	0.002	0.001	0.001	0.001	0.001	0.000	0.002	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.003	0.001	0.002	0.000
547840	4179860	0.003	0.003	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.000	0.000	0.003	0.001	0.002	0.000

AIR Operational HRA Calculations

UCSF Parnassus Heights LRDP

Initial Phase of LRDP (2030)

Summary of Operational Cancer Risk, Hazard Index, and annual average $PM_{2.5}$ concentration

Operation Cancer Risk

Receptor Type	UTM E	UTM N	Background	Project	Cumulative	Location
Resident	547980	4179600	9.68	0.26	9.94	Edgewood Ave
Resident, onsite hall	547600	4179700	23.21	0.04	23.25	3rd Ave Housing
School	548260	4179640	33.34	0.00	33.35	Haight Ashbury Community Nursery School
Day Care	547480	4179400	9.50	0.01	9.51	Kirkham Child Care Center

Operational Chronic Hazard Index, unitless

Receptor Type	UTM E	UTM N	Background	Project	Cumulative	Location
Resident	547980	4179580	4.44	0.00	4.44	Edgewood Ave
Resident, onsite hall	547600	4179700	2.41	0.00	2.41	3rd Ave Housing
School	548260	4179620	2.01	0.00	2.01	Haight Ashbury Community Nursery School
Day Care	547560	4179660	3.82	0.00	3.82	Lucia Child Care Center

Operational Acute Hazard Index, unitless

Receptor Type	UTM E	UTM N	Background	Project	Cumulative	Location
Resident	547980	4179520	NA	0.00	0.00	Edgewood Ave
Resident, onsite hall	547600	4179720	NA	0.00	0.00	3rd Ave Housing
School	547240	4179660	NA	0.00	0.00	Independence High
Day Care	547560	4179660	NA	0.00	0.00	Lucia Child Care Center

Operational $PM_{2.5}$ Concentration, ug/m^3

Receptor Type	UTM E	UTM N	Background	Project	Cumulative	
Resident	547980	4179580	8.33	0.01	8.34	Edgewood Ave
Resident, onsite hall	547600	4179780	8.33	0.00	8.33	145 Irving St
School	548260	4179620	8.59	0.00	8.59	Haight Ashbury Community Nursery School
Day Care	547480	4179400	8.22	0.00	8.22	Kirkham Child Care Center

UCSF Parnassus Heights LRDP
Initial Phase of LRDP (2030)
Operational Inhalation Cancer Risk for Residential Child to Adult Receptor

Risk = ∑Dose *CFP *ASF *ED /AT * FAH |
where,

Dose= C * (BR/BW) *A * EF * 10^-6
CFP = Cancer Potency Factor
ASF = Age sentivity factor
ED = Exposure duration
AT = Averaging time, 70 yrs
FAH = Fraction of time at home
Cair = Pollutant concentration
(BR/BW) = Daily Breathing Rate
A = Inhalation absorption factor
EF = Exposure Frequency
i = age bin groups

Equations Rearranged
Risk = C * CFP * ∑ [(BR/BW) * A * EF * ASF * ED /AT * FAH * 10^6]

Risk inputs part 1

Age Bin	BR/BW (L/kg-day)	A	EF	FAH	ED/AT	ASF	CF1 (ug/mg)	CF1 (L/m³)	(BR/BW)*A *EF* ASF*ED/AT *FAH* 10^-6
3rd Trimester	361	1	0.96	1	0.00	10	1.00E-03	1.00E-03	1.24E-05
1<2	1050	1	0.96	1	0.03	10	1.00E-03	1.00E-03	2.99E-04
2<16	745	1	0.96	0.72	0.20	3	1.00E-03	1.00E-03	3.06E-04
16>30	335	1	0.96	0.28	0.20	1	1.00E-03	1.00E-03	5.35E-05
								total	9.57E-04

Risk calculations part 1

Pollutant Concentrations by Source

Risk calculations part 2

Unique Identifier			Emission Source	EDG	Fume Hoods														PCUP									EDG	FH	PCUP	Total	Receptor Type Determination
			CPF (mg/kg-day)⁻¹	1.1	12	0.1	500	0.17	15	0.15	0.019	510	0.027	0.0087	0.25	0.072	0.021	0.0049	1.5	0.0035	0.91	3.9	0.27	0.6	0.01	0.1	0.0087	0.021	0.12	0.013	3.9	Cancer Risk (per million)				
	UTM-X	UTM-Y	DPM (ug/m³)	Arsenic (ug/m³)	Benzene (ug/m³)	Benzidine (ug/m³)	Benzyl chloride (ug/m³)	Cadmium (ug/m³)	Carbon tetrachloride (ug/m³)	Chloroform (ug/m³)	Chromium (VI) (ug/m³)	Dioxane, 1,4- (ug/m³)	Ethyl Benzene (ug/m³)	Ethylene dibromide (ug/m³)	Ethylene dichloride (ug/m³)	Formaldehyde (ug/m³)	Hydrazine (ug/m³)	Methylene bis (2-chloroaniline) 4,4'- (ug/m³)	Methylene chloride (ug/m³)	Nickel (ug/m³)	PAH (as benzo(a)pyrene) (ug/m³)	Vinyl chloride (ug/m³)	1,3-Butadiene (ug/m³)	Acetaldehyde (ug/m³)	Benzene (ug/m³)	Ethyl Benzene (ug/m³)	Formaldehyde (ug/m³)	Naphthalene (ug/m³)	Propylene oxide (ug/m³)	PAH (as benzo(a)pyrene) (ng/m³)				
5477760	4179620	8.08E-04	1.77E-10	2.63E-05	0.00E+00	6.03E-08	2.64E-08	8.11E-05	5.52E-03	3.22E-10	3.88E-05	1.69E-05	2.18E-05	2.43E-06	1.30E-04	1.20E-06	0.00E+00	7.05E-03	0.00E+00	3.54E-13	0.00E+00	6.51E-09	6.32E-07	1.49E-04	5.42E-07	2.11E-04	2.88E-08	4.39E-07	1.66E-08	0.59	0.10	0.00	0.70	campus
5478004	4179620	7.69E-04	1.82E-10	2.70E-05	0.00E+00	6.20E-08	2.71E-08	8.32E-05	5.68E-03	3.30E-10	3.99E-05	1.73E-05	2.24E-05	2.50E-06	1.33E-04	1.24E-06	0.00E+00	7.24E-03	0.00E+00	3.63E-13	0.00E+00	6.68E-09	4.11E-07	9.49E-05	3.59E-07	1.35E-04	2.00E-08	2.82E-07	1.12E-08	0.56	0.11	0.00	0.67	campus
5477760	4179620	7.60E-04	1.61E-10	2.40E-05	0.00E+00	5.50E-08	2.41E-08	7.39E-05	5.03E-03	2.93E-10	3.54E-05	1.54E-05	1.99E-05	2.22E-06	1.18E-04	1.10E-06	0.00E+00	6.43E-03	0.00E+00	3.23E-13	0.00E+00	1.10E-08	1.06E-06	2.53E-06	8.97E-07	3.60E-04	4.54E-08	7.41E-07	2.70E-08	0.56	0.09	0.01	0.66	campus
5477840	4179620	7.39E-04	1.58E-10	2.35E-05	0.00E+00	5.39E-08	2.36E-08	7.23E-05	4.91E-03	2.87E-10	3.46E-05	1.34E-05	2.17E-05	1.96E-06	1.15E-04	1.07E-06	0.00E+00	6.28E-03	0.00E+00	3.15E-13	0.00E+00	9.68E-09	8.34E-07	1.99E-06	7.05E-07	2.83E-04	3.54E-08	5.86E-07	2.12E-08	0.54	0.09	0.00	0.64	campus
5478220	4179620	7.19E-04	1.81E-10	2.69E-05	0.00E+00	6.17E-08	2.70E-08	8.29E-05	5.64E-03	3.29E-10	3.97E-05	1.73E-05	2.23E-05	2.49E-06	1.33E-04	1.23E-06	0.00E+00	7.20E-03	0.00E+00	3.62E-13	0.00E+00	3.49E-09	1.43E-07	7.88E-07	3.01E-07	1.12E-04	1.69E-08	2.35E-07	9.40E-09	0.53	0.11	0.00	0.63	campus
5478000	4179640	7.14E-04	1.63E-10	2.42E-05	0.00E+00	5.55E-08	2.43E-08	7.46E-05	5.07E-03	2.96E-10	3.57E-05	1.55E-05	2.00E-05	2.24E-06	1.19E-04	1.11E-06	0.00E+00	6.48E-03	0.00E+00	3.26E-13	0.00E+00	5.33E-09	5.17E-07	1.21E-06	4.45E-07	1.73E-04	2.35E-08	3.59E-07	1.36E-08	0.52	0.09	0.00	0.62	campus
5477760	4179640	6.87E-04	1.45E-10	2.16E-05	0.00E+00	4.98E-08	2.18E-08	6.66E-05	4.53E-03	2.64E-10	3.19E-05	1.39E-05	1.79E-05	2.01E-06	1.06E-04	9.93E-07	0.00E+00	5.79E-03	0.00E+00	2.91E-13	0.00E+00	1.32E-08	1.28E-06	3.03E-06	1.08E-06	4.33E-04	5.22E-08	8.90E-07	3.17E-08	0.50	0.08	0.01	0.59	campus
5478220	4179640	6.67E-04	1.63E-10	2.42E-05	0.00E+00	5.55E-08	2.43E-08	7.46E-05	5.07E-03	2.96E-10	3.57E-05	1.55E-05	2.00E-05	2.24E-06	1.19E-04	1.11E-06	0.00E+00	6.48E-03	0.00E+00	3.26E-13	0.00E+00	3.80E-09	3.74E-07	8.63E-07	3.28E-07	1.23E-04	1.83E-08	2.56E-07	1.02E-08	0.50	0.09	0.00	0.59	campus
5478040	4179620	6.62E-04	1.77E-10	2.63E-05	0.00E+00	6.02E-08	2.63E-08	8.09E-05	5.51E-03	3.21E-10	3.88E-05	1.69E-05	2.17E-05	2.43E-06	1.30E-04	1.20E-06	0.00E+00	7.04E-03	0.00E+00	3.53E-13	0.00E+00	1.37E-08	1.37E-06	3.27E-06	1.17E-06	1.82E-04	2.54E-08	3.71E-07	1.48E-08	0.49	0.10	0.00	0.59	campus
5477760	4179600	6.41E-04	1.74E-10	2.59E-05	0.00E+00	5.93E-08	2.59E-08	7.96E-05	5.42E-03	3.16E-10	3.81E-05	1.66E-05	2.14E-05	2.39E-06	1.28E-04	1.18E-06	0.00E+00	6.92E-03	0.00E+00	3.48E-13	0.00E+00	4.72E-09	4.64E-07	1.09E-06	4.07E-07	1.54E-04	2.27E-08	3.18E-07	1.27E-08	0.47	0.10	0.00	0.57	campus
5478040	4179600	6.24E-04	1.80E-10	2.68E-05	0.00E+00	6.14E-08	2.68E-08	8.25E-05	5.61E-03	3.27E-10	3.95E-05	1.72E-05	2.22E-05	2.47E-06	1.32E-04	1.22E-06	0.00E+00	7.17E-03	0.00E+00	3.60E-13	0.00E+00	3.39E-09	3.31E-07	7.73E-07	2.90E-07	1.10E-04	1.62E-08	2.26E-07	9.01E-09	0.46	0.10	0.00	0.56	campus
5478040	4179640	6.33E-04	1.61E-10	2.39E-05	0.00E+00	5.47E-08	2.39E-08	7.35E-05	5.00E-03	2.92E-10	3.52E-05	1.53E-05	1.98E-05	2.21E-06	1.18E-04	1.09E-06	0.00E+00	6.39E-03	0.00E+00	3.21E-13	0.00E+00	3.79E-09	3.73E-07	8.63E-07	3.27E-07	1.23E-04	1.83E-08	2.56E-07	1.02E-08	0.46	0.09	0.00	0.56	campus
5478220	4179600	5.94E-04	1.70E-10	2.66E-05	0.00E+00	6.09E-08	2.66E-08	8.18E-05	5.57E-03	3.25E-10	3.92E-05	1.71E-05	2.20E-05	2.45E-06	1.31E-04	1.22E-06	0.00E+00	7.12E-03	0.00E+00	3.57E-13	0.00E+00	2.69E-09	2.67E-07	6.95E-07	2.33E-07	8.64E-05	1.37E-08	1.81E-07	7.48E-09	0.44	0.10	0.00	0.54	campus
5478040	4179620	5.84E-04	1.70E-10	2.53E-05	0.00E+00	5.79E-08	2.53E-08	7.78E-05	5.29E-03	3.09E-10	3.73E-05	1.62E-05	2.09E-05	2.34E-06	1.25E-04	1.16E-06	0.00E+00	6.77E-03	0.00E+00	3.40E-13	0.00E+00	3.06E-09	3.01E-07	6.91E-07	2.65E-07	9.82E-05	1.48E-08	2.07E-07	8.26E-09	0.43	0.10	0.00	0.53	campus
5477840	4179600	5.64E-04	1.58E-10	2.35E-05	0.00E+00	5.39E-08	2.36E-08	7.23E-05	4.91E-03	2.87E-10	3.47E-05	1.51E-05	1.95E-05	2.17E-06	1.16E-04	1.08E-06	0.00E+00	6.30E-03	0.00E+00	3.16E-13	0.00E+00	7.98E-09	7.86E-07	1.99E-06	6.78E-07	2.82E-04	3.56E-08	5.48E-07	2.06E-08	0.43	0.09	0.00	0.52	campus
5478040	4179640	5.83E-04	1.60E-10	2.38E-05	0.00E+00	5.44E-08	2.38E-08	7.31E-05	4.98E-03	2.90E-10	3.50E-05	1.52E-05	1.96E-05	2.19E-06	1.17E-04	1.09E-06	0.00E+00	6.36E-03	0.00E+00	3.19E-13	0.00E+00	3.72E-09	3.66E-07	8.43E-07	3.21E-07	1.20E-04	1.80E-08	2.51E-07	1.00E-08	0.43	0.09	0.00	0.52	campus
5478040	4179600	5.58E-04	1.73E-10	2.57E-05	0.00E+00	5.89E-08	2.58E-08	7.92E-05	5.39E-03	3.14E-10	3.79E-05	1.65E-05	2.13E-05	2.38E-06	1.27E-04	1.18E-06	0.00E+00	6.89E-03	0.00E+00	3.46E-13	0.00E+00	2.47E-09	2.44E-07	5.57E-07	2.16E-07	7.91E-05	1.25E-08	1.66E-07	6.82E-09	0.41	0.10	0.00	0.51	campus
5478220	4179660	5.16E-04	1.38E-10	2.06E-05	0.00E+00	4.72E-08	2.06E-08	6.34E-05	4.29E-03	2.50E-10	3.02E-05	1.31E-05	1.69E-05	1.89E-06	1.01E-04	9.37E-07	0.00E+00	5.48E-03	0.00E+00	2.75E-13	0.00E+00	5.20E-09	5.16E-07	1.23E-06	4.47E-07	1.75E-04	2.41E-08	3.57E-07	1.38E-08	0.38	0.08	0.00	0.46	campus
5478000	4179660	5.15E-04	1.35E-10	2.00E-05	0.00E+00	4.59E-08	2.01E-08	6.16E-05	4.16E-03	2.45E-10	2.95E-05	1.28E-05	1.66E-05	1.85E-06	9.87E-06	9.16E-07	0.00E+00	5.36E-03	0.00E+00	2.69E-13	0.00E+00	5.98E-09	5.77E-07	1.37E-06	4.93E-07	1.95E-04	2.56E-08	4.02E-07	1.50E-08	0.38	0.08	0.00	0.46	campus
5478040	4179640	5.14E-04	1.46E-10	2.58E-05	0.00E+00	4.39E-08	2.09E-08	6.44E-05	4.37E-03	2.55E-10	3.07E-05	1.34E-05	1.72E-05	1.93E-06	1.03E-04	9.54E-07	0.00E+00	5.58E-03	0.00E+00	2.80E-13	0.00E+00	4.79E-09	4.62E-07	1.10E-06	4.01E-07	1.57E-04	2.07E-08	3.22E-07	1.21E-08	0.44	0.08	0.00	0.52	campus
5477760	4179660	5.01E-04	1.28E-10	1.91E-05	0.00E+00	4.37E-08	1.91E-08	5.87E-05	3.96E-03	2.33E-10	2.81E-05	1.22E-05	1.58E-05	1.76E-06	9.41E-06	8.73E-07	0.00E+00	5.11E-03	0.00E+00	2.56E-13	0.00E+00	9.15E-09	8.76E-07	2.11E-06	7.38E-07	3.00E-04	3.65E-08	6.17E-07	2.21E-08	0.37	0.07	0.00	0.45	campus
5478040	4179660	4.97E-04	1.62E-10	2.41E-05	0.00E+00	4.91E-08	2.35E-08	7.41E-05	5.04E-03	2.94E-10	3.55E-05	1.54E-05	1.99E-05	2.22E-06	1.19E-04	1.10E-06	0.00E+00	6.44E-03	0.00E+00	3.23E-13	0.00E+00	2.23E-09	2.23E-07	5.04E-07	1.81E-07	7.21E-05	1.15E-08	1.52E-07	5.27E-09	0.35	0.09	0.00	0.44	campus
5478040	4179660	4.86E-04	1.44E-10	2.14E-05	0.00E+00	4.91E-08	2.15E-08	6.59E-05	4.48E-03	2.62E-10	3.16E-05	1.37E-05	1.77E-05	1.98E-06	1.06E-04	9.81E-07	0.00E+00	5.73E-03	0.00E+00	2.88E-13	0.00E+00	8.67E-09	8.36E-07	2.02E-06	7.10E-07	2.87E-04	3.62E-08	5.85E-07	2.14E-08	0.36	0.08	0.00	0.44	campus
5477760	4179640	4.47E-04	1.47E-10	2.17E-05	0.00E+00	4.01E-08	1.77E-08	5.44E-05	3.76E-03	2.16E-10	2.61E-05	1.13E-05	1.46E-05	1.63E-06	8.71E-06	8.08E-07	0.00E+00	4.73E-03	0.00E+00	2.37E-13	0.00E+00	1.38E-08	1.31E-06	3.17E-06	1.11E-06	4.51E-04	5.32E-08	9.26E-07	3.26E-08	0.33	0.07	0.00	0.40	campus
5477840	4179640	4.23E-04	1.48E-10	2.21E-05	0.00E+00	5.00E-08	2.21E-08	6.80E-05	4.63E-03	2.70E-10	3.26E-05	1.42E-05	1.83E-05	2.04E-06	1.09E-04	1.01E-06	0.00E+00	5.91E-03	0.00E+00	2.97E-13	0.00E+00	5.09E-09	4.94E-07	1.17E-06	4.24E-07	1.66E-04	2.23E-08	3.43E-07	1.29E-08	0.31	0.09	0.00	0.40	campus
5477840	4179620	4.21E-04	1.36E-10	2.03E-05	0.00E+00	4.60E-08	2.03E-08	6.26E-05	4.26E-03	2.48E-10	3.00E-05	1.30E-05	1.68E-05	1.87E-06	1.00E-04	9.28E-07	0.00E+00	5.44E-03	0.00E+00	2.73E-13	0.00E+00	1.06E-08	1.01E-06	2.43E-06	8.53E-07	3.46E-04	4.10E-08	7.09E-07	2.49E-08	0.31	0.08	0.00	0.39	campus
5477840	4179620	4.18E-04	1.55E-10	2.30E-05	0.00E+00	5.27E-08	2.30E-08	7.08E-05	4.82E-03	2.81E-10	3.39E-05	1.48E-05	1.90E-05	2.12E-06	1.14E-04	1.05E-06	0.00E+00	6.16E-03	0.00E+00	3.09E-13	0.00E+00	3.10E-09	3.01E-07	6.91E-07	2.63E-07	9.81E-05	1.46E-08	2.06E-07	8.18E-09	0.30	0.09	0.00	0.39	campus
5477420	4179640	4.09E-04	1.24E-10	1.84E-05	0.00E+00	4.21E-08	1.84E-08	5.66E-05	3.85E-03	2.25E-10	2.71E-05	1.18E-05	1.52E-05	1.70E-06	9.07E-06	8.41E-07	0.00E+00	4.92E-03	0.00E+00	2.47E-13	0.00E+00	1.77E-08	1.70E-06	4.10E-06	1.44E-06	5.83E-04	7.29E-08	1.19E-06	4.34E-08	0.30	0.07	0.01	0.38	campus
5478040	4179660	3.97E-04	1.38E-10	2.06E-05	0.00E+00	4.71E-08	2.06E-08	6.33E-05	4.31E-03	2.51E-10	3.04E-05	1.32E-05	1.70E-05	1.90E-06	1.01E-04	9.41E-07	0.00E+00	5.50E-03	0.00E+00	2.76E-13	0.00E+00	1.20E-08	1.14E-06	2.84E-06	9.97E-07	4.04E-04	4.78E-08	8.21E-07	2.87E-08	0.28	0.08	0.00	0.37	campus
5478220	4179580	3.76E-04	1.56E-10	2.32E-05	0.00E+00	5.32E-08	2.33E-08	7.14E-05	4.86E-03	2.84E-10	3.42E-05	1.49E-05	1.92E-05	2.14E-06	1.14E-04	1.06E-06	0.00E+00	6.21E-03	0.00E+00	3.12E-13	0.00E+00	1.81E-08	1.85E-06	4.16E-07	1.72E-07	5.88E-05	1.11E-08	1.22E-07	5.66E-09	0.28	0.09	0.00	0.37	campus
5478040	4179580	3.73E-04	1.57E-10	2.34E-05	0.00E+00	5.35E-08	2.34E-08	7.19E-05	4.89E-03	2.86E-10	3.44E-05	1.50E-05	1.93E-05	2.16E-06	1.15E-04	1.07E-06	0.00E+00	6.25E-03	0.00E+00	3.14E-13	0.00E+00	2.91E-09	2.96E-07	6.81E-07	2.71E-07	9.61E-05	1.71E-08	1.97E-07	8.94E-09	0.27	0.09	0.00	0.37	campus
5478040	4179580	3.72E-04	1.49E-10	2.21E-05	0.00E+00	5.07E-08	2.22E-08	6.81E-05	4.63E-03	2.70E-10	3.26E-05	1.42E-05	1.83E-05	2.04E-06	1.09E-04	1.01E-06	0.00E+00	5.92E-03	0.00E+00	2.97E-13	0.00E+00	1.52E-09	1.53E-07	3.46E-07	1.40E-07	4.89E-05	8.67E-09	1.02E-07	4.53E-09	0.27	0.09	0.00	0.36	campus
5477840	4179580	3.61E-04	1.51E-10	2.24E-05	0.00E+00	5.14E-08	2.24E-08	6.90E-05	4.70E-03	2.74E-10	3.31E-05	1.44E-05	1.86E-05	2.07E-06	1.11E-04	1.02E-06	0.00E+00	6.01E-03	0.00E+00	3.02E-13	0.00E+00	1.84E-09	1.87E-07	4.19E-07	1.70E-07	5.92E-05	1.04E-08	1.23E-07	5.48E-09	0.26	0.09	0.00	0.35	campus
5478040	4179680	3.78E-04	1.20E-10	1.78E-05	0.00E+00	4.07E-08	1.78E-08	5.47E-05	3.72E-03	2.17E-10	2.62E-05	1.14E-05	1.47E-05	1.64E-06	8.77E-06	8.14E-07	0.00E+00	4.76E-03	0.00E+00	2.39E-13	0.00E+00	1.33E-08	1.28E-06	3.14E-06	1.08E-06	4.46E-04	5.41E-08	8.99E-07	3.25E-08	0.28	0.07	0.01	0.35	campus
5478040	4179660	3.74E-04	1.38E-10	2.04E-05	0.00E+00	4.67E-08	2.04E-08	6.27E-05	4.26E-03	2.48E-10	2.99E-05	1.30E-05	1.68E-05	1.87E-06	1.00E-04	9.28E-07	0.00E+00	5.45E-03	0.00E+00	2.73E-13	0.00E+00	2.21E-08	2.12E-06	5.20E-06	1.79E-06	7.39E-04	8.98E-08	1.49E-06	5.38E-08	0.27	0.07	0.00	0.35	campus
5478080	4179600	3.38E-04	1.46E-10	2.17E-05	0.00E+00	4.98E-08	2.18E-08	6.69E-05	4.55E-03	2.66E-10	3.20E-05	1.39E-05	1.80E-05	2.01E-06	1.07E-04	9.94E-07	0.00E+00	5.82E-03	0.00E+00	2.92E-13	0.00E+00	2.12E-09	2.10E-07	4.79E-07	1.85E-07	6.81E-05	1.06E-08	1.43E-07	5.84E-09	0.25	0.08	0.00	0.33	campus
5478220	4179680	3.42E-04	1.14E-10	1.69E-05	0.00E+00	3.88E-08	1.70E-08	5.21E-05	3.55E-03	2.07E-10	2.50E-05	1.09E-05	1.40E-05	1.56E-06	8.35E-06	7.75E-07	0.00E+00	4.53E-03	0.00E+00	2.28E-13	0.00E+00	7.66E-09	7.36E-07	1.79E-06	6.31E-07	2.54E-04	3.30E-08	5.13E-07	1.92E-08	0.25	0.07	0.00	0.32	campus
5477680	4179580	3.17E-04	1.36E-10	2.06E-05	0.00E+00	4.71E-08	2.07E-08	6.35E-05	4.30E-03	2.51E-10	3.04E-05	1.32E-05	1.71E-05	1.90E-06	1.02E-04	9.43E-07	0.00E+00	5.52E-03	0.00E+00	2.77E-13	0.00E+00	7.11E-09	6.93E-07	1.67E-06	6.00E-07	2.34E-04	3.24E-08	4.79E-07	1.85E-08	0.23	0.08	0.00	0.32	campus
5478040	4179580	3.22E-04	1.36E-10	2.03E-05	0.00E+00	4.65E-08	2.03E-08	6.25E-05	4.25E-03	2.48E-10	2.99E-05	1.30E-05	1.68E-05	1.87E-06	1.00E-04	9.28E-07	0.00E+00	5.43E-03	0.00E+00	2.73E-13	0.00E+00	1.33E-09	1.34E-07	3.03E-07	1.23E-07	4.28E-05	7.75E-09	8.94E-08	4.02E-09	0.24	0.08	0.00	0.32	campus
5478040	4179600	3.12E-04	1.20E-10	1.78E-05	0.00E+00	4.09E-08	1.78E-08	5.48E-05	3.73E-03	2.18E-10	2.63E-05	1.14E-05	1.47E-05	1.64E-06	8.78E-06	8.15E-07	0.00E+00	4.77E-03	0.00E+00	2.39E-13	0.00E+00	6.06E-09	2.05E-06	6.66E-07	2.23E-07	8.66E-05	8.78E-09	1.75E-08	6.06E-09	0.23	0.07	0.01	0.31	campus
5477740	4179600	3.07E-04	1.35E-10	2.00E-05	0.00E+00	4.59E-08	2.01E-08	6.17E-05	4.20E-03	2.45E-10	2.95E-05	1.29E-05	1.66E-05	1.85E-06	9.88E-06	9.17E-07	0.00E+00	5.36E-03	0.00E+00	2.69E-13	0.00E+00	1.27E-08	1.24E-06	2.98E-06	1.07E-06	4.23E-04	5.68E-08	8.59E-07	3.27E-08	0.23	0.08	0.01	0.31	campus
5478040	4179680	3.08E-04	1.16E-10	1.61E-05	0.00E+00	3.69E-08	1.61E-08	4.94E-05	3.36E-03	1.96E-10	2.37E-05	1.03E-05	1.33E-05	1.48E-06	7.91E-06	7.34E-07	0.00E+00	4.30E-03	0.00E+00	2.16E-13	0.00E+00	6.35E-09	6.17E-07	1.63E-06	5.73E-07	2.31E-04	2.94E-08	4.69E-07	1.73E-08	0.23	0.06	0.00	0.29	campus
5477900	4179640	2.92E-04	1.24E-10	1.84E-05	0.00E+00	4.23E-08	1.85E-08	5.68E-05	3.86E-03	2.25E-10	2.72E-05	1.18E-05	1.53E-05	1.70E-06	9.10E-06	8.44E-07	0.00E+00	4.94E-03	0.00E+00	2.48E-13	0.00E+00	4.51E-09	4.38E-07	1.03E-06	3.78E-07	1.47E-04	2.02E-08	3.04E-07	1.16E-08	0.21	0.07	0.00	0.29	campus
5477900	4179660	2.52E-04	8.64E-11	1.28E-05	0.00E+00	2.93E-08	1.28E-08	3.93E-05	2.67E-03	1.56E-10	1.88E-05	8.18E-06	1.06E-05	1.18E-06	6.29E-06	5.84E-07	0.00E+00	3.41E-03	0.00E+00	1.71E-13	0.00E+00	1.25E-08	1.22E-06	2.94E-06	1.06E-06	4.16E-04	5.60E-08	9.27E-07	3.21E-08	0.18	0.05	0.00	0.23	campus
5478040	4179700	2.81E-04	1.02E-10	1.51E-05	0.00E+00	3.47E-08	1.52E-08	4.66E-05	3.17E-03	1.85E-10	2.23E-05	9.72E-06	1.25E-05	1.40E-06	7.47E-06	6.93E-07	0.00E+00	4.05E-03	0.00E+00	2.04E-13	0.00E+00	3.62E-08	3.46E-06	8.55E-06	2.87E-06	1.21E-03	1.37E-07	2.44E-06	8.49E-08	0.21	0.06	0.02	0.28	campus
5477960	4179660	2.82E-04	1.16E-10	1.73E-05	0.00E+00	3.97E-08	1.74E-08	5.33E-05	3.63E-03	2.12E-10	2.55E-05	1.11E-05	1.46E-05	1.60E-06	8.53E-06	7.92E-07	0.00E+00	4.71E-03	0.00E+00	2.34E-13	0.00E+00	1.95E-08	1.89E-06	4.58E-06	1.64E-06	6.49E-04	7.75E-08	1.34E-06	4.64E-08	0.21	0.07	0.01	0.28	campus
5477940	4179700	2.82E-04	1.00E-10	1.49E-05	0.00E+00	3.41E-08	1.49E-08	4.58E-05	3.12E-03	1.82E-10	2.20E-05	9.56E-06	1.23E-05	1.38E-06	7.35E-06	6.82E-07	0.00E+00	3.99E-03	0.00E+00	2.00E-13	0.00E+00	2.58E-08	2.47E-06	6.11E-06	2.07E-06	8.68E-04	1.00E-07	1.74E-06	6.14E-08	0.21	0.06	0.01	0.28	campus
5477940	4179660	2.85E-04	1.03E-10	1.54E-05	0.00E+00	3.52E-08	1.54E-08	4.73E-05	3.22E-03	1.88E-10	2.27E-05	9.86E-06	1.27E-05	1.42E-06	7.59E-06	7.03E-07	0.00E+00	4.11E-03	0.00E+00	2.07E-13	0.00E+00	1.82E-08	1.74E-06	4.19E-06	1.45E-06	5.97E-04	7.10E-08	1.22E-06	4.33E-08	0.21	0.06	0.01	0.28	campus
5477940	4179620	2.32E-04	8.28E-11	1.47E-05	0.00E+00	2.81E-08	1.23E-08	3.77E-05	2.56E-03	1.81E-10	2.18E-05	7.89E-06	1.02E-05	1.14E-06	6.07E-06	5.62E-07	0.00E+00	3.82E-03	0.00E+00	1.66E-13	0.00E+00	1.06E-08	1.01E-06	2.57E-06	8.85E-07	3.64E-04	4.48E-08	7.31E-07	2.87E-08	0.17	0.05	0.00	0.23	pot. res.
5477960	4179620	2.60E-04	8.83E-11	1.31E-05	0.00E+

UCSF Parnassus Heights LRDP
Initial Phase of LRDP (2030)
Operational Inhalation Cancer Risk for Daycare and School Receptors

Risk = $\sum[\text{Dose}_i * \text{CFP} * \text{ASF}_i * \text{ED}_i/\text{AT} * \text{FAH}_i]$

where,

Dose = C_{air} * {BR/BW} *A * EF * 10

[6] CFP = Cancer Potency Factor
ASF = Age sentivity factor
ED = Exposure duration
AT = Averaging time, 70 yrs
FAH = Fraction of time at home
Cair = Pollutant concentration
{BR/BW} = Daily Breathing Rate
A = Inhalation absorption factor
EF = Exposure Frequency
i = age bin groups

Equations Rearranged
Risk = $C_{air} * \text{CPF} * \sum [\{BR/BW\}_i * A * EF * ASF_i * ED_i /AT * FAH_i * 10^{-6}]$

Risk inputs part 1 / Risk calculations part 1

Daycare/School	Age Bin	BR/BW (L/kg-day)	A	EF	FAH	ED/AT	ASF	CF1 (ug/mg)	CF1 (L/m³)		{BR/BW}ᵢ * A * EF * ASFᵢ * EDᵢ/AT * FAHᵢ * 10⁶
Lucia Child Care Center	0<2	1200	1	0.68	0.33	0.03	10	1.00E-03	1.00E-03		7.69E-05
	2<9	640	1	0.68	0.33	0.07	3	1.00E-03	1.00E-03		3.08E-05
										total	**1.08E-04**
ABC Bay Area Child Care	0<2	1200	1	0.68	0.33	0.03	10	1.00E-03	1.00E-03		7.69E-05
	2<9	640	1	0.68	0.33	0.07	3	1.00E-03	1.00E-03		3.08E-05
										total	**1.08E-04**
Kirkham Child Care Center	0<2	1200	1	0.68	0.33	0.03	10	1.00E-03	1.00E-03		7.69E-05
	2<9	640	1	0.68	0.33	0.07	3	1.00E-03	1.00E-03		3.08E-05
										total	**1.08E-04**
Clarendon Alternative Elementary	2<16	520	1	0.49	0.33	0.10	3	1.00E-03	1.00E-03		2.52E-05
										total	**2.52E-05**
Independence High	2<16	520	1	0.49	0.33	0.07	3	1.00E-03	1.00E-03		1.80E-05
										total	**1.80E-05**
Stepping Stones Preschool	2<16	520	1	0.49	0.33	0.06	3	1.00E-03	1.00E-03		1.44E-05
										total	**1.44E-05**
Haight Ashbury Community Nursery School	2<16	520	1	0.49	0.33	0.06	3	1.00E-03	1.00E-03		1.44E-05
										total	**1.44E-05**

Pollutant Concentrations by Source

Unique Identifier	Emission Source		EDG	Fume Hoods						
	CPF (mg/kg-day)⁻¹		1.1	12	0.1	500	0.17	15	0.15	0.019	510
	UTM X	UTM Y	DPM (ug/m³)	Arsenic (ug/m³)	Benzene (ug/m³)	Benzidine (ug/m³)	Benzyl chloride (ug/m³)	Cadmium (ug/m³)	Carbon tetrachloride (ug/m³)	Chloroform (ug/m³)	Chromium (VI) (ug/m³)
547900 4178680	547900	4178680	9.70E-06	4.26E-12	6.34E-07	0.00E+00	1.45E-09	6.35E-10	1.95E-06	1.33E-04	7.75E-12
547920 4178680	547920	4178680	9.67E-06	4.25E-12	6.33E-07	0.00E+00	1.45E-09	6.34E-10	1.95E-06	1.32E-04	7.73E-12
547940 4178680	547940	4178680	9.64E-06	4.24E-12	6.31E-07	0.00E+00	1.45E-09	6.32E-10	1.94E-06	1.32E-04	7.71E-12
547880 4178660	547880	4178660	9.49E-06	4.17E-12	6.20E-07	0.00E+00	1.42E-09	6.21E-10	1.91E-06	1.30E-04	7.58E-12
547900 4178660	547900	4178660	9.46E-06	4.16E-12	6.19E-07	0.00E+00	1.42E-09	6.20E-10	1.91E-06	1.30E-04	7.56E-12
547920 4178660	547920	4178660	9.43E-06	4.15E-12	6.18E-07	0.00E+00	1.41E-09	6.19E-10	1.90E-06	1.29E-04	7.55E-12
547880 4178640	547880	4178640	9.27E-06	4.07E-12	6.06E-07	0.00E+00	1.39E-09	6.07E-10	1.86E-06	1.27E-04	7.40E-12
547900 4178640	547900	4178640	9.22E-06	4.06E-12	6.04E-07	0.00E+00	1.38E-09	6.05E-10	1.86E-06	1.27E-04	7.38E-12
547920 4178640	547920	4178640	9.18E-06	4.06E-12	6.03E-07	0.00E+00	1.38E-09	6.05E-10	1.86E-06	1.26E-04	7.37E-12
547880 4178620	547880	4178620	9.10E-06	3.97E-12	5.91E-07	0.00E+00	1.35E-09	5.92E-10	1.82E-06	1.24E-04	7.22E-12
547900 4178620	547900	4178620	9.05E-06	3.96E-12	5.89E-07	0.00E+00	1.35E-09	5.90E-10	1.81E-06	1.23E-04	7.20E-12
547860 4178600	547860	4178600	8.91E-06	3.89E-12	5.79E-07	0.00E+00	1.33E-09	5.80E-10	1.78E-06	1.21E-04	7.07E-12
547880 4178600	547880	4178600	8.88E-06	3.88E-12	5.77E-07	0.00E+00	1.32E-09	5.78E-10	1.78E-06	1.21E-04	7.05E-12
547900 4178600	547900	4178600	8.86E-06	3.87E-12	5.76E-07	0.00E+00	1.32E-09	5.77E-10	1.77E-06	1.21E-04	7.03E-12
547920 4178600	547920	4178600	8.78E-06	3.86E-12	5.75E-07	0.00E+00	1.32E-09	5.76E-10	1.77E-06	1.20E-04	7.02E-12
547880 4178580	547880	4178580	8.64E-06	3.79E-12	5.64E-07	0.00E+00	1.29E-09	5.65E-10	1.74E-06	1.18E-04	6.89E-12
547900 4178580	547900	4178580	8.61E-06	3.77E-12	5.62E-07	0.00E+00	1.29E-09	5.63E-10	1.73E-06	1.18E-04	6.86E-12
547920 4178580	547920	4178580	8.55E-06	3.77E-12	5.61E-07	0.00E+00	1.29E-09	5.62E-10	1.73E-06	1.17E-04	6.85E-12
547240 4179660	547240	4179660	1.55E-05	7.10E-12	1.06E-06	0.00E+00	2.42E-09	1.06E-09	3.25E-06	2.21E-04	1.29E-11
547220 4179660	547220	4179660	1.49E-05	6.85E-12	1.02E-06	0.00E+00	2.33E-09	1.02E-09	3.14E-06	2.13E-04	1.24E-11
547240 4179680	547240	4179680	1.48E-05	6.77E-12	1.01E-06	0.00E+00	2.31E-09	1.01E-09	3.10E-06	2.11E-04	1.23E-11
547220 4179680	547220	4179680	1.43E-05	6.55E-12	9.75E-07	0.00E+00	2.23E-09	9.77E-10	3.00E-06	2.04E-04	1.19E-11
547180 4179700	547180	4179700	1.29E-05	5.91E-12	8.80E-07	0.00E+00	2.02E-09	8.82E-10	2.71E-06	1.84E-04	1.08E-11
547180 4179720	547180	4179720	1.25E-05	5.72E-12	8.52E-07	0.00E+00	1.95E-09	8.53E-10	2.62E-06	1.78E-04	1.04E-11
547160 4179700	547160	4179700	1.25E-05	5.76E-12	8.57E-07	0.00E+00	1.96E-09	8.58E-10	2.64E-06	1.79E-04	1.05E-11
547160 4179720	547160	4179720	1.21E-05	5.58E-12	8.30E-07	0.00E+00	1.90E-09	8.32E-10	2.56E-06	1.74E-04	1.01E-11
548260 4179620	548260	4179620	1.21E-04	4.19E-11	6.24E-06	0.00E+00	1.43E-08	6.25E-09	1.92E-05	1.31E-03	7.62E-11
548280 4179620	548280	4179620	1.17E-04	4.06E-11	6.04E-06	0.00E+00	1.38E-08	6.05E-09	1.86E-05	1.26E-03	7.38E-11
548260 4179640	548260	4179640	1.22E-04	4.11E-11	6.11E-06	0.00E+00	1.40E-08	6.12E-09	1.88E-05	1.28E-03	7.47E-11
548280 4179640	548280	4179640	1.18E-04	3.97E-11	5.91E-06	0.00E+00	1.35E-08	5.92E-09	1.82E-05	1.24E-03	7.22E-11
547560 4179660	547560	4179660	7.88E-06	5.03E-11	7.48E-06	0.00E+00	1.71E-08	7.50E-09	2.30E-05	1.57E-03	9.14E-11
547560 4179680	547560	4179680	7.94E-06	3.34E-11	4.96E-06	0.00E+00	1.14E-08	4.97E-09	1.53E-05	1.04E-03	6.07E-11
547540 4179660	547540	4179660	9.22E-06	2.66E-11	3.96E-06	0.00E+00	9.07E-09	3.97E-09	1.22E-05	8.29E-04	4.84E-11
547540 4179680	547540	4179680	8.52E-06	2.04E-11	3.04E-06	0.00E+00	6.96E-09	3.04E-09	9.35E-06	6.36E-04	3.71E-11
547220 4179140	547220	4179140	1.60E-05	7.67E-12	1.14E-06	0.00E+00	2.62E-09	1.14E-09	3.52E-06	2.39E-04	1.40E-11
547200 4179140	547200	4179140	1.54E-05	7.65E-12	1.14E-06	0.00E+00	2.61E-09	1.14E-09	3.50E-06	2.38E-04	1.39E-11
547480 4179400	547480	4179400	4.20E-05	1.81E-11	2.69E-06	0.00E+00	6.16E-09	2.69E-09	8.28E-06	5.63E-04	3.29E-11
547460 4179400	547460	4179400	4.04E-05	1.77E-11	2.64E-06	0.00E+00	6.04E-09	2.64E-09	8.12E-06	5.52E-04	3.22E-11

Unique Identifier	Fume Hoods										
	0.027	0.0087	0.25	0.072	0.021	0.0049	1.5	0.0035	0.91	3.9	0.27
	Dioxane, 1,4- (ug/m³)	Ethyl Benzene (ug/m³)	Ethylene dibromide (ug/m³)	Ethylene dichloride (ug/m³)	Formaldehyde (ug/m³)	Hydrazine (ug/m³)	Methylene bis (2-chloroaniline), 4,4'- (ug/m³)	Methylene chloride (ug/m³)	Nickel (ug/m³)	PAH (as benzo(a)pyrene) (ug/m³)	Vinyl chloride (ug/m³)
547900 4178680	9.35E-07	4.07E-07	5.24E-07	5.86E-08	3.13E-06	2.90E-08	0.00E+00	1.70E-04	0.00E+00	8.52E-15	0.00E+00
547920 4178680	9.33E-07	4.06E-07	5.23E-07	5.84E-08	3.12E-06	2.89E-08	0.00E+00	1.69E-04	0.00E+00	8.50E-15	0.00E+00
547940 4178680	9.30E-07	4.05E-07	5.22E-07	5.83E-08	3.11E-06	2.89E-08	0.00E+00	1.69E-04	0.00E+00	8.48E-15	0.00E+00
547880 4178660	9.14E-07	3.98E-07	5.13E-07	5.73E-08	3.06E-06	2.84E-08	0.00E+00	1.66E-04	0.00E+00	8.34E-15	0.00E+00
547900 4178660	9.12E-07	3.97E-07	5.12E-07	5.72E-08	3.05E-06	2.83E-08	0.00E+00	1.66E-04	0.00E+00	8.32E-15	0.00E+00
547920 4178660	9.10E-07	3.96E-07	5.11E-07	5.71E-08	3.05E-06	2.83E-08	0.00E+00	1.65E-04	0.00E+00	8.30E-15	0.00E+00
547880 4178640	8.93E-07	3.88E-07	5.01E-07	5.59E-08	2.99E-06	2.77E-08	0.00E+00	1.62E-04	0.00E+00	8.14E-15	0.00E+00
547900 4178640	8.91E-07	3.88E-07	5.00E-07	5.58E-08	2.98E-06	2.76E-08	0.00E+00	1.62E-04	0.00E+00	8.12E-15	0.00E+00
547920 4178640	8.90E-07	3.87E-07	4.99E-07	5.57E-08	2.98E-06	2.76E-08	0.00E+00	1.62E-04	0.00E+00	8.11E-15	0.00E+00
547880 4178620	8.71E-07	3.79E-07	4.89E-07	5.46E-08	2.91E-06	2.70E-08	0.00E+00	1.58E-04	0.00E+00	7.94E-15	0.00E+00
547900 4178620	8.69E-07	3.78E-07	4.87E-07	5.44E-08	2.91E-06	2.70E-08	0.00E+00	1.58E-04	0.00E+00	7.92E-15	0.00E+00
547860 4178600	8.54E-07	3.71E-07	4.79E-07	5.35E-08	2.86E-06	2.65E-08	0.00E+00	1.55E-04	0.00E+00	7.78E-15	0.00E+00
547880 4178600	8.51E-07	3.70E-07	4.77E-07	5.33E-08	2.85E-06	2.64E-08	0.00E+00	1.55E-04	0.00E+00	7.76E-15	0.00E+00
547900 4178600	8.49E-07	3.69E-07	4.76E-07	5.32E-08	2.84E-06	2.63E-08	0.00E+00	1.54E-04	0.00E+00	7.74E-15	0.00E+00
547920 4178600	8.47E-07	3.69E-07	4.75E-07	5.31E-08	2.83E-06	2.63E-08	0.00E+00	1.54E-04	0.00E+00	7.72E-15	0.00E+00
547880 4178580	8.31E-07	3.62E-07	4.66E-07	5.21E-08	2.78E-06	2.58E-08	0.00E+00	1.51E-04	0.00E+00	7.58E-15	0.00E+00
547900 4178580	8.28E-07	3.60E-07	4.64E-07	5.19E-08	2.77E-06	2.57E-08	0.00E+00	1.50E-04	0.00E+00	7.55E-15	0.00E+00
547920 4178580	8.27E-07	3.60E-07	4.64E-07	5.18E-08	2.77E-06	2.57E-08	0.00E+00	1.50E-04	0.00E+00	7.54E-15	0.00E+00
547240 4179660	1.56E-06	6.77E-07	8.73E-07	9.75E-08	5.21E-06	4.83E-08	0.00E+00	2.83E-04	0.00E+00	1.42E-14	0.00E+00
547220 4179660	1.50E-06	6.53E-07	8.43E-07	9.41E-08	5.03E-06	4.66E-08	0.00E+00	2.73E-04	0.00E+00	1.37E-14	0.00E+00
547240 4179680	1.48E-06	6.46E-07	8.33E-07	9.30E-08	4.97E-06	4.61E-08	0.00E+00	2.70E-04	0.00E+00	1.35E-14	0.00E+00
547220 4179680	1.44E-06	6.25E-07	8.06E-07	9.00E-08	4.81E-06	4.46E-08	0.00E+00	2.61E-04	0.00E+00	1.31E-14	0.00E+00
547180 4179700	1.30E-06	5.64E-07	7.28E-07	8.13E-08	4.34E-06	4.03E-08	0.00E+00	2.36E-04	0.00E+00	1.18E-14	0.00E+00
547180 4179720	1.26E-06	5.46E-07	7.04E-07	7.87E-08	4.20E-06	3.90E-08	0.00E+00	2.28E-04	0.00E+00	1.14E-14	0.00E+00
547160 4179700	1.26E-06	5.50E-07	7.09E-07	7.91E-08	4.23E-06	3.92E-08	0.00E+00	2.29E-04	0.00E+00	1.15E-14	0.00E+00
547160 4179720	1.22E-06	5.32E-07	6.87E-07	7.67E-08	4.09E-06	3.80E-08	0.00E+00	2.22E-04	0.00E+00	1.12E-14	0.00E+00
548260 4179620	9.20E-06	4.00E-06	5.16E-06	5.76E-07	3.08E-05	2.85E-07	0.00E+00	1.67E-03	0.00E+00	8.38E-14	0.00E+00
548280 4179620	8.90E-06	3.87E-06	4.99E-06	5.58E-07	2.98E-05	2.76E-07	0.00E+00	1.62E-03	0.00E+00	8.12E-14	0.00E+00
548260 4179640	9.01E-06	3.92E-06	5.05E-06	5.65E-07	3.01E-05	2.80E-07	0.00E+00	1.64E-03	0.00E+00	8.21E-14	0.00E+00
548280 4179640	8.71E-06	3.79E-06	4.89E-06	5.46E-07	2.91E-05	2.70E-07	0.00E+00	1.58E-03	0.00E+00	7.94E-14	0.00E+00
547560 4179660	1.10E-05	4.80E-06	6.19E-06	6.91E-07	3.69E-05	3.42E-07	0.00E+00	2.00E-03	0.00E+00	1.01E-13	0.00E+00
547560 4179680	7.32E-06	3.18E-06	4.11E-06	4.59E-07	2.45E-05	2.27E-07	0.00E+00	1.33E-03	0.00E+00	6.67E-14	0.00E+00
547540 4179660	5.84E-06	2.54E-06	3.27E-06	3.66E-07	1.95E-05	1.81E-07	0.00E+00	1.06E-03	0.00E+00	5.32E-14	0.00E+00
547540 4179680	4.48E-06	1.95E-06	2.51E-06	2.81E-07	1.50E-05	1.39E-07	0.00E+00	8.13E-04	0.00E+00	4.08E-14	0.00E+00
547220 4179140	1.68E-06	7.33E-07	9.44E-07	1.05E-07	5.63E-06	5.22E-08	0.00E+00	3.06E-04	0.00E+00	1.53E-14	0.00E+00
547200 4179140	1.68E-06	7.30E-07	9.42E-07	1.05E-07	5.62E-06	5.21E-08	0.00E+00	3.05E-04	0.00E+00	1.53E-14	0.00E+00
547480 4179400	3.96E-06	1.72E-06	2.22E-06	2.48E-07	1.33E-05	1.23E-07	0.00E+00	7.20E-04	0.00E+00	3.61E-14	0.00E+00
547460 4179400	3.89E-06	1.69E-06	2.18E-06	2.44E-07	1.30E-05	1.21E-07	0.00E+00	7.06E-04	0.00E+00	3.55E-14	0.00E+00

Risk calculations part 2

Unique Identifier	PCUP								EDG	FH	PCUP	Total	Receptor Type Determination
	0.6	0.01	0.1	0.0087	0.021	0.12	0.013	3.9	Cancer Risk (per million)				
	1,3-Butadiene (ug/m³)	Acetaldehyde (ug/m³)	Benzene (ug/m³)	Ethyl Benzene (ug/m³)	Formaldehyde (ug/m³)	Naphthalene (ug/m³)	Propylene oxide (ug/m³)	PAH (as benzo(a)pyrene) (ug/m³)					
547900 4178680	1.40E-09	1.35E-07	3.30E-07	1.14E-07	4.68E-05	5.82E-09	9.41E-08	3.45E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547920 4178680	1.38E-09	1.33E-07	3.27E-07	1.13E-07	4.64E-05	5.76E-09	9.32E-08	3.42E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547940 4178680	1.37E-09	1.32E-07	3.24E-07	1.12E-07	4.60E-05	5.70E-09	9.23E-08	3.38E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547880 4178660	1.37E-09	1.32E-07	3.24E-07	1.12E-07	4.60E-05	5.72E-09	9.24E-08	3.39E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547900 4178660	1.36E-09	1.31E-07	3.22E-07	1.12E-07	4.57E-05	5.68E-09	9.18E-08	3.37E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547920 4178660	1.35E-09	1.30E-07	3.20E-07	1.11E-07	4.53E-05	5.63E-09	9.11E-08	3.34E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547880 4178640	1.34E-09	1.29E-07	3.17E-07	1.10E-07	4.50E-05	5.59E-09	9.03E-08	3.31E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547900 4178640	1.33E-09	1.28E-07	3.14E-07	1.09E-07	4.45E-05	5.53E-09	8.95E-08	3.28E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547920 4178640	1.31E-09	1.26E-07	3.11E-07	1.07E-07	4.41E-05	5.48E-09	8.85E-08	3.24E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547880 4178620	1.32E-09	1.27E-07	3.12E-07	1.08E-07	4.43E-05	5.50E-09	8.89E-08	3.26E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547900 4178620	1.31E-09	1.26E-07	3.09E-07	1.07E-07	4.38E-05	5.45E-09	8.81E-08	3.23E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547860 4178600	1.30E-09	1.25E-07	3.06E-07	1.06E-07	4.35E-05	5.40E-09	8.73E-08	3.20E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547880 4178600	1.29E-09	1.24E-07	3.05E-07	1.06E-07	4.33E-05	5.38E-09	8.69E-08	3.19E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547900 4178600	1.29E-09	1.24E-07	3.04E-07	1.05E-07	4.31E-05	5.35E-09	8.67E-08	3.17E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547920 4178600	1.27E-09	1.22E-07	2.99E-07	1.04E-07	4.25E-05	5.27E-09	8.53E-08	3.12E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547880 4178580	1.25E-09	1.21E-07	2.97E-07	1.03E-07	4.21E-05	5.23E-09	8.45E-08	3.10E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547900 4178580	1.25E-09	1.20E-07	2.95E-07	1.02E-07	4.18E-05	5.20E-09	8.41E-08	3.08E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547920 4178580	1.23E-09	1.19E-07	2.91E-07	1.01E-07	4.13E-05	5.12E-09	8.29E-08	3.04E-09	0.00	0.00	0.00	0.00	Clarendon Alternative Elementary
547240 4179660	2.22E-09	2.13E-07	5.25E-07	1.81E-07	7.45E-05	9.08E-09	1.50E-07	5.43E-09	0.00	0.00	0.00	0.00	Independence High
547220 4179660	2.17E-09	2.08E-07	5.12E-07	1.76E-07	7.27E-05	8.85E-09	1.46E-07	5.29E-09	0.00	0.00	0.00	0.00	Independence High
547240 4179680	2.17E-09	2.09E-07	5.14E-07	1.77E-07	7.29E-05	8.89E-09	1.47E-07	5.32E-09	0.00	0.00	0.00	0.00	Independence High
547220 4179680	2.12E-09	2.04E-07	5.01E-07	1.72E-07	7.11E-05	8.66E-09	1.43E-07	5.18E-09	0.00	0.00	0.00	0.00	Independence High
547180 4179700	2.00E-09	1.92E-07	4.72E-07	1.62E-07	6.69E-05	8.15E-09	1.35E-07	4.87E-09	0.00	0.00	0.00	0.00	Stepping Stones Preschool
547180 4179720	1.97E-09	1.90E-07	4.66E-07	1.60E-07	6.61E-05	8.06E-09	1.33E-07	4.82E-09	0.00	0.00	0.00	0.00	Stepping Stones Preschool
547160 4179700	1.95E-09	1.87E-07	4.61E-07	1.58E-07	6.54E-05	7.95E-09	1.32E-07	4.76E-09	0.00	0.00	0.00	0.00	Stepping Stones Preschool
547160 4179720	1.93E-09	1.86E-07	4.56E-07	1.57E-07	6.47E-05	7.89E-09	1.30E-07	4.72E-09	0.00	0.00	0.00	0.00	Stepping Stones Preschool
548260 4179620	1.35E-08	1.29E-06	3.18E-06	1.10E-06	4.51E-04	5.53E-08	9.07E-07	3.30E-08	0.00	0.00	0.00	0.00	Haight Ashbury Community Nursery School
548280 4179620	1.31E-08	1.26E-06	3.09E-06	1.07E-06	4.38E-04	5.37E-08	8.82E-07	3.20E-08	0.00	0.00	0.00	0.00	Haight Ashbury Community Nursery School
548260 4179640	1.31E-08	1.26E-06	3.09E-06	1.06E-06	4.38E-04	5.35E-08	8.81E-07	3.20E-08	0.00	0.00	0.00	0.00	Haight Ashbury Community Nursery School
548280 4179640	1.27E-08	1.22E-06	3.00E-06	1.03E-06	4.26E-04	5.21E-08	8.57E-07	3.11E-08	0.00	0.00	0.00	0.00	Haight Ashbury Community Nursery School
547560 4179660	4.81E-09	4.65E-07	1.14E-06	3.96E-07	1.61E-04	2.04E-08	3.24E-07	1.20E-08	0.00	0.00	0.00	0.01	Lucia Child Care Center
547560 4179680	4.83E-09	4.66E-07	1.14E-06	3.96E-07	1.62E-04	2.02E-08	3.26E-07	1.20E-08	0.00	0.00	0.00	0.00	Lucia Child Care Center
547540 4179660	4.43E-09	4.27E-07	1.05E-06	3.64E-07	1.48E-04	1.87E-08	2.98E-07	1.10E-08	0.00	0.00	0.00	0.00	Lucia Child Care Center
547540 4179680	4.35E-09	4.20E-07	1.03E-06	3.57E-07	1.46E-04	1.82E-08	2.94E-07	1.08E-08	0.00	0.00	0.00	0.00	Lucia Child Care Center
547220 4179140	2.82E-09	2.71E-07	6.67E-07	2.29E-07	9.46E-05	1.15E-08	1.90E-07	6.87E-09	0.00	0.00	0.00	0.00	ABC Bay Area Child Care
547200 4179140	2.87E-09	2.76E-07	6.79E-07	2.33E-07	9.64E-05	1.17E-08	1.94E-07	7.00E-09	0.00	0.00	0.00	0.00	ABC Bay Area Child Care
547480 4179400	6.25E-09	6.02E-07	1.48E-06	5.10E-07	2.10E-04	2.59E-08	4.22E-07	1.54E-08	0.00	0.00	0.00	0.01	Kirkham Child Care Center
547460 4179400	6.05E-09	5.82E-07	1.43E-06	4.94E-07	2.03E-04	2.50E-08	4.08E-07	1.49E-08	0.00	0.00	0.00	0.01	Kirkham Child Care Center

UCSF Parnassus Heights LRDP
Initial Phase of LRDP (2030)
Operational Inhalation Chronic Hazard Index for Residential Receptor

Chronic Hazard Quotient = Annual Average Concentration / Chronic REL

Pollutant Concentrations by Source

Unique Identifier	Emission Source		Chronic REL (ug/m^3)		0.015	3	0.02	40	300	0.2	70	3000	0.8	400	9	0.2	0.09	0.03	0.03	400	0.014	2000	0.35	200	3	2000	9	7000	9	30	300	700	Total Hazard Index	Receptor Type Determination
	UTM X	UTM Y	DPM (ug/m^3)		Arsenic (ug/m^3)	Benzene (ug/m^3)	Cadmium (ug/m^3)	Carbon tetrachloride (ug/m^3)	Chloroform (ug/m^3)	Chromium (VI) (ug/m^3)	Ethylbenzene (ug/m^3)	Diacetyl (ug/m^3)	Ethylene dibromide (ug/m^3)	Hexane (ug/m^3)	Ethylene dichloride (ug/m^3)	Formaldehyde (ug/m^3)	Hydrazine (ug/m^3)	Methylene chloride (ug/m^3)	Perchloroethylene (ug/m^3)	Toluene (ug/m^3)	Trichloroethylene (ug/m^3)	Vinyl chloride (ug/m^3)	Mercuric chloride (ug/m^3)	Methyl ethyl ketone (ug/m^3)	Nickel (ug/m^3)	Ethylene Glycol (ug/m^3)	Acetaldehyde (ug/m^3)	Acrolein (ug/m^3)	Ammonia (ug/m^3)	Benzene (ug/m^3)	13-Butadiene (ug/m^3)	Ethyl benzene (ug/m^3)	Formaldehyde (ug/m^3)	Hexane (ug/m^3)	Naphthalene (ug/m^3)	Propylene oxide (ug/m^3)	Toluene (ug/m^3)	Xylene (ug/m^3)		
547960	4179560	2.32E-04	8.28E-11	1.23E-05	1.23E-08	3.79E-05	2.57E-03	1.53E-10	0.00E+00	1.81E-03	1.02E-05	1.14E-06	6.06E-05	5.62E-07	2.13E-09	0.00E+00	8.41E-12	3.29E-03	0.00E+00	7.89E-06	1.04E-05	1.53E-06	2.57E-05	1.68E-07	8.85E-06	3.54E-03	5.20E-07	4.48E-07	7.31E-06	2.83E-07	1.85E-03	0.00	campus
547960	4179600	2.52E-04	8.64E-11	1.29E-05	1.29E-08	3.96E-05	2.68E-03	1.57E-10	0.00E+00	1.90E-03	1.06E-05	1.19E-06	6.34E-05	5.88E-07	2.22E-09	0.00E+00	8.80E-12	3.44E-03	0.00E+00	8.25E-06	9.79E-06	1.60E-06	2.68E-05	1.01E-07	8.35E-06	3.41E-03	5.37E-07	4.31E-07	6.83E-06	2.67E-07	1.75E-03	0.00	campus
547960	4179640	2.63E-04	7.67E-11	1.14E-05	1.14E-08	3.51E-05	2.38E-03	1.39E-10	0.00E+00	1.68E-03	9.44E-06	1.05E-06	5.63E-05	5.22E-07	1.97E-09	0.00E+00	7.81E-12	3.05E-03	0.00E+00	7.32E-06	9.25E-06	1.42E-06	2.38E-05	9.74E-08	7.92E-06	3.27E-03	4.96E-07	3.93E-07	6.57E-06	2.53E-07	1.62E-03	0.00	campus
547960	4179680	2.24E-04	7.84E-11	1.17E-05	1.17E-08	3.59E-05	2.44E-03	1.42E-10	0.00E+00	1.72E-03	9.64E-06	1.08E-06	5.75E-05	5.33E-07	1.99E-09	0.00E+00	7.98E-12	3.12E-03	0.00E+00	7.48E-06	7.72E-06	1.42E-06	2.43E-05	9.23E-08	1.89E-06	8.01E-06	6.53E-06	2.68E-06	1.33E-06	2.54E-06	1.03E-07	1.30E-03	0.00	campus
547960	4179720	1.96E-04	7.36E-11	1.10E-05	1.10E-08	3.37E-05	2.29E-03	1.34E-10	0.00E+00	1.61E-03	9.06E-06	1.01E-06	5.40E-05	5.01E-07	1.87E-09	0.00E+00	7.49E-12	2.93E-03	0.00E+00	7.02E-06	7.26E-06	1.32E-06	8.63E-03	1.79E-05	7.58E-06	6.11E-06	2.54E-03	1.33E-06	2.39E-06	1.03E-06	1.27E-03	0.00	campus
547960	4179640	2.40E-04	8.10E-11	1.21E-05	1.21E-08	3.71E-05	2.53E-03	1.47E-10	0.00E+00	1.78E-03	9.97E-06	1.11E-06	5.95E-05	5.52E-07	2.06E-09	0.00E+00	8.25E-12	3.23E-03	0.00E+00	7.73E-06	6.62E-06	1.24E-06	7.98E-03	5.64E-06	2.30E-03	3.52E-06	2.89E-07	4.63E-06	1.79E-07	1.18E-03	0.00	pot res
547960	4179600	2.52E-04	8.64E-11	1.29E-05	1.29E-08	3.96E-05	2.68E-03	1.57E-10	0.00E+00	1.90E-03	1.06E-05	1.19E-06	6.34E-05	5.88E-07	2.22E-09	0.00E+00	8.80E-12	3.44E-03	0.00E+00	8.25E-06	7.07E-06	1.32E-06	8.52E-03	6.02E-06	2.45E-03	3.76E-06	3.09E-07	4.94E-06	1.91E-07	1.26E-03	0.00	pot res
547960	4179620	2.60E-04	8.93E-11	1.33E-05	1.33E-08	4.09E-05	2.75E-03	1.61E-10	0.00E+00	1.94E-03	1.09E-05	1.21E-06	6.48E-05	6.01E-07	2.23E-09	0.00E+00	9.00E-12	3.52E-03	0.00E+00	8.43E-06	5.49E-06	1.04E-06	6.66E-03	1.34E-05	3.07E-06	4.78E-06	1.90E-03	3.20E-07	4.16E-06	1.67E-07	1.09E-03	0.00	campus
547960	4179640	2.63E-04	9.04E-11	1.34E-05	1.34E-08	4.13E-05	2.78E-03	1.63E-10	0.00E+00	1.96E-03	1.10E-05	1.22E-06	6.55E-05	6.07E-07	2.25E-09	0.00E+00	9.09E-12	3.56E-03	0.00E+00	8.52E-06	5.46E-06	1.04E-06	6.62E-03	1.33E-05	3.05E-06	4.75E-06	1.89E-03	3.18E-07	4.13E-06	1.66E-07	1.08E-03	0.00	pot res
547960	4179740	2.40E-04	7.24E-11	1.08E-05	1.08E-08	3.31E-05	2.25E-03	1.32E-10	0.00E+00	1.59E-03	8.90E-06	9.95E-07	5.31E-05	4.93E-07	1.84E-09	0.00E+00	7.37E-12	2.88E-03	0.00E+00	6.91E-06	4.07E-06	7.52E-07	4.88E-03	1.00E-05	4.24E-06	3.45E-06	1.42E-03	1.98E-07	3.08E-06	1.24E-07	8.06E-04	0.00	campus
547960	4179720	1.96E-04	7.36E-11	1.10E-05	1.10E-08	3.37E-05	2.29E-03	1.34E-10	0.00E+00	1.61E-03	9.06E-06	1.01E-06	5.40E-05	5.01E-07	1.87E-09	0.00E+00	7.49E-12	2.93E-03	0.00E+00	7.02E-06	4.14E-06	7.65E-07	4.96E-03	1.02E-05	4.31E-06	3.51E-06	1.44E-03	2.01E-07	3.13E-06	1.26E-07	8.19E-04	0.00	pot res
547960	4179740	1.79E-04	6.60E-11	1.01E-05	1.01E-08	3.11E-05	2.12E-03	1.24E-10	0.00E+00	1.49E-03	8.37E-06	9.34E-07	4.99E-05	4.63E-07	1.73E-09	0.00E+00	6.92E-12	2.71E-03	0.00E+00	6.49E-06	4.94E-06	8.77E-07	5.80E-03	1.23E-05	5.15E-06	4.12E-06	1.72E-03	1.69E-07	1.96E-06	3.50E-06	1.37E-07	8.46E-04	0.00	campus
547960	4179720	2.04E-04	7.52E-11	1.15E-05	1.15E-08	3.55E-05	2.43E-03	1.42E-10	0.00E+00	1.84E-03	1.03E-05	1.15E-06	6.17E-05	5.72E-07	2.09E-09	0.00E+00	8.53E-12	3.29E-03	0.00E+00	7.91E-06	5.63E-06	1.01E-06	7.61E-03	1.40E-05	4.93E-06	3.95E-06	1.65E-03	2.30E-07	3.58E-06	1.44E-07	9.37E-04	0.00	pot res
547960	4179720	2.17E-04	8.01E-11	1.22E-05	1.22E-08	3.78E-05	2.59E-03	1.49E-10	0.00E+00	1.96E-03	1.09E-05	1.22E-06	6.57E-05	6.09E-07	2.22E-09	0.00E+00	9.08E-12	3.73E-03	0.00E+00	8.42E-06	5.98E-06	1.07E-06	8.09E-03	1.49E-05	5.24E-06	4.20E-06	1.84E-03	2.45E-07	3.81E-06	1.53E-07	9.96E-04	0.00	pot res
547960	4179740	2.40E-04	8.86E-11	1.34E-05	1.34E-08	4.14E-05	2.84E-03	1.64E-10	0.00E+00	2.15E-03	1.20E-05	1.34E-06	7.21E-05	6.68E-07	2.44E-09	0.00E+00	9.96E-12	4.09E-03	0.00E+00	9.24E-06	6.56E-06	1.17E-06	8.87E-03	1.64E-05	5.75E-06	4.61E-06	2.02E-03	2.69E-07	4.18E-06	1.68E-07	1.09E-03	0.00	pot res
547960	4179760	2.63E-04	9.71E-11	1.46E-05	1.46E-08	4.53E-05	3.11E-03	1.80E-10	0.00E+00	2.36E-03	1.31E-05	1.47E-06	7.90E-05	7.32E-07	2.67E-09	0.00E+00	1.09E-11	4.48E-03	0.00E+00	1.01E-05	7.19E-06	1.28E-06	9.72E-03	1.80E-05	6.30E-06	5.05E-06	2.21E-03	2.95E-07	4.58E-06	1.84E-07	1.19E-03	0.00	pot res
547960	4179720	2.17E-04	8.01E-11	1.22E-05	1.22E-08	3.78E-05	2.59E-03	1.49E-10	0.00E+00	1.96E-03	1.09E-05	1.22E-06	6.57E-05	6.09E-07	2.22E-09	0.00E+00	9.08E-12	3.73E-03	0.00E+00	8.42E-06	5.98E-06	1.07E-06	8.09E-03	1.49E-05	5.24E-06	4.20E-06	1.84E-03	2.45E-07	3.81E-06	1.53E-07	9.96E-04	0.00	pot res
547960	4179760	2.81E-04	1.03E-10	1.51E-05	1.52E-08	4.66E-05	3.17E-03	1.85E-10	0.00E+00	2.23E-03	1.25E-05	1.40E-06	7.47E-05	6.93E-07	2.59E-09	0.00E+00	1.04E-11	4.05E-03	0.00E+00	9.72E-06	3.45E-06	6.12E-07	4.05E-03	8.55E-06	3.62E-06	2.87E-06	1.21E-03	1.19E-07	1.97E-06	1.37E-07	2.44E-06	9.48E-06	5.92E-06	0.00	campus
547960	4179740	2.52E-04	9.29E-11	1.36E-05	1.37E-08	4.18E-05	2.85E-03	1.66E-10	0.00E+00	2.00E-03	1.12E-05	1.26E-06	6.71E-05	6.22E-07	2.32E-09	0.00E+00	9.35E-12	3.74E-03	0.00E+00	8.73E-06	3.10E-06	5.50E-07	3.64E-03	7.68E-06	3.25E-06	2.58E-06	1.09E-03	1.07E-07	1.77E-06	1.23E-07	2.19E-06	8.51E-06	5.32E-06	0.00	pot res
548000	4179580	2.13E-04	7.54E-11	1.12E-05	1.12E-08	3.45E-05	2.35E-03	1.37E-10	0.00E+00	1.65E-03	9.28E-06	1.04E-06	5.54E-05	5.13E-07	1.92E-09	0.00E+00	7.68E-12	3.00E-03	0.00E+00	7.20E-06	4.83E-06	8.94E-07	5.79E-03	1.18E-05	5.01E-06	4.09E-06	1.68E-03	2.42E-07	2.08E-06	1.38E-07	8.54E-06	1.88E-06	1.47E-06	0.00	campus
548000	4179600	2.52E-04	8.64E-11	1.29E-05	1.29E-08	3.96E-05	2.68E-03	1.57E-10	0.00E+00	1.90E-03	1.06E-05	1.19E-06	6.34E-05	5.88E-07	2.22E-09	0.00E+00	8.80E-12	3.44E-03	0.00E+00	8.25E-06	5.34E-06	9.88E-07	6.40E-03	1.30E-05	5.54E-06	4.52E-06	1.86E-03	2.67E-07	2.30E-06	1.52E-07	9.44E-06	2.08E-06	1.62E-06	0.00	pot res
548000	4179740	1.79E-04	6.60E-11	1.01E-05	1.01E-08	3.11E-05	2.12E-03	1.24E-10	0.00E+00	1.49E-03	8.37E-06	9.34E-07	4.99E-05	4.63E-07	1.73E-09	0.00E+00	6.92E-12	2.71E-03	0.00E+00	6.49E-06	4.94E-06	8.77E-07	5.80E-03	1.23E-05	5.15E-06	4.12E-06	1.72E-03	1.69E-07	1.96E-06	3.50E-06	1.37E-07	8.46E-04	0.00	campus
548000	4179720	2.04E-04	7.52E-11	1.15E-05	1.15E-08	3.55E-05	2.43E-03	1.42E-10	0.00E+00	1.84E-03	1.03E-05	1.15E-06	6.17E-05	5.72E-07	2.09E-09	0.00E+00	8.53E-12	3.29E-03	0.00E+00	7.91E-06	5.63E-06	1.01E-06	7.61E-03	1.40E-05	4.93E-06	3.95E-06	1.65E-03	2.30E-07	3.58E-06	1.44E-07	9.37E-04	0.00	pot res
548000	4179740	2.17E-04	8.01E-11	1.22E-05	1.22E-08	3.78E-05	2.59E-03	1.49E-10	0.00E+00	1.96E-03	1.09E-05	1.22E-06	6.57E-05	6.09E-07	2.22E-09	0.00E+00	9.08E-12	3.73E-03	0.00E+00	8.42E-06	5.98E-06	1.07E-06	8.09E-03	1.49E-05	5.24E-06	4.20E-06	1.84E-03	2.45E-07	3.81E-06	1.53E-07	9.96E-04	0.00	pot res
548000	4179760	2.81E-04	1.03E-10	1.51E-05	1.52E-08	4.66E-05	3.17E-03	1.85E-10	0.00E+00	2.23E-03	1.25E-05	1.40E-06	7.47E-05	6.93E-07	2.59E-09	0.00E+00	1.04E-11	4.05E-03	0.00E+00	9.72E-06	3.45E-06	6.12E-07	4.05E-03	8.55E-06	3.62E-06	2.87E-06	1.21E-03	1.19E-07	1.97E-06	1.37E-07	2.44E-06	9.48E-06	5.92E-06	0.00	pot res
548000	4179780	2.52E-04	9.29E-11	1.36E-05	1.37E-08	4.18E-05	2.85E-03	1.66E-10	0.00E+00	2.00E-03	1.12E-05	1.26E-06	6.71E-05	6.22E-07	2.32E-09	0.00E+00	9.35E-12	3.74E-03	0.00E+00	8.73E-06	3.10E-06	5.50E-07	3.64E-03	7.68E-06	3.25E-06	2.58E-06	1.09E-03	1.07E-07	1.77E-06	1.23E-07	2.19E-06	8.51E-06	5.32E-06	0.00	pot res
548000	4179740	2.40E-04	8.86E-11	1.34E-05	1.34E-08	4.14E-05	2.84E-03	1.64E-10	0.00E+00	2.15E-03	1.20E-05	1.34E-06	7.21E-05	6.68E-07	2.44E-09	0.00E+00	9.96E-12	4.09E-03	0.00E+00	9.24E-06	6.56E-06	1.17E-06	8.87E-03	1.64E-05	5.75E-06	4.61E-06	2.02E-03	2.69E-07	4.18E-06	1.68E-07	1.09E-03	0.00	pot res
548000	4179760	2.63E-04	9.71E-11	1.46E-05	1.46E-08	4.53E-05	3.11E-03	1.80E-10	0.00E+00	2.36E-03	1.31E-05	1.47E-06	7.90E-05	7.32E-07	2.67E-09	0.00E+00	1.09E-11	4.48E-03	0.00E+00	1.01E-05	7.19E-06	1.28E-06	9.72E-03	1.80E-05	6.30E-06	5.05E-06	2.21E-03	2.95E-07	4.58E-06	1.84E-07	1.19E-03	0.00	pot res
548000	4179780	2.52E-04	9.29E-11	1.36E-05	1.37E-08	4.18E-05	2.85E-03	1.66E-10	0.00E+00	2.00E-03	1.12E-05	1.26E-06	6.71E-05	6.22E-07	2.32E-09	0.00E+00	9.35E-12	3.74E-03	0.00E+00	8.73E-06	3.10E-06	5.50E-07	3.64E-03	7.68E-06	3.25E-06	2.58E-06	1.09E-03	1.07E-07	1.77E-06	1.23E-07	2.19E-06	8.51E-06	5.32E-06	0.00	pot res
548020	4179560	2.13E-04	7.54E-11	1.12E-05	1.12E-08	3.45E-05	2.35E-03	1.37E-10	0.00E+00	1.65E-03	9.28E-06	1.04E-06	5.54E-05	5.13E-07	1.92E-09	0.00E+00	7.68E-12	3.00E-03	0.00E+00	7.20E-06	4.83E-06	8.94E-07	5.79E-03	1.18E-05	5.01E-06	4.09E-06	1.68E-03	2.42E-07	2.08E-06	1.38E-07	8.54E-06	1.88E-06	1.47E-06	0.00	campus
548020	4179580	2.04E-04	7.24E-11	1.08E-05	1.08E-08	3.31E-05	2.25E-03	1.32E-10	0.00E+00	1.59E-03	8.90E-06	9.95E-07	5.31E-05	4.93E-07	1.84E-09	0.00E+00	7.37E-12	2.88E-03	0.00E+00	6.91E-06	4.07E-06	7.52E-07	4.88E-03	1.00E-05	4.24E-06	3.45E-06	1.42E-03	1.98E-07	3.08E-06	1.24E-07	8.06E-04	0.00	campus
548020	4179600	1.97E-04	6.96E-11	1.08E-05	1.08E-08	3.57E-05	2.46E-03	1.43E-10	0.00E+00	1.70E-03	9.55E-06	1.07E-06	5.70E-05	5.29E-07	1.98E-09	0.00E+00	7.92E-12	3.09E-03	0.00E+00	7.42E-06	6.95E-06	1.23E-06	8.37E-03	1.73E-05	7.26E-06	5.92E-06	2.48E-03	3.46E-07	5.38E-06	2.12E-07	1.35E-03	0.00	pot res
548000	4179540	1.73E-04	6.58E-11	9.92E-06	9.92E-09	3.02E-05	2.05E-03	1.20E-10	0.00E+00	1.44E-03	8.10E-06	9.05E-07	4.83E-05	4.48E-07	1.68E-09	0.00E+00	6.70E-12	2.62E-03	0.00E+00	6.28E-06	4.20E-06	7.61E-07	4.93E-03	1.03E-05	4.30E-06	3.53E-06	1.47E-03	1.75E-07	2.73E-06	1.09E-07	7.31E-06	2.96E-06	1.13E-06	0.00	campus
548000	4179560	1.70E-04	6.48E-11	9.64E-06	9.66E-09	2.97E-05	2.02E-03	1.18E-10	0.00E+00	1.42E-03	7.97E-06	8.91E-07	4.76E-05	4.41E-07	1.65E-09	0.00E+00	6.59E-12	2.58E-03	0.00E+00	6.18E-06	4.14E-06	7.50E-07	4.86E-03	1.02E-05	4.24E-06	3.48E-06	1.45E-03	1.72E-07	2.69E-06	1.07E-07	7.20E-06	2.91E-06	1.11E-06	0.00	pot res
548020	4179580	2.04E-04	7.24E-11	1.08E-05	1.08E-08	3.31E-05	2.25E-03	1.32E-10	0.00E+00	1.59E-03	8.90E-06	9.95E-07	5.31E-05	4.93E-07	1.84E-09	0.00E+00	7.37E-12	2.88E-03	0.00E+00	6.91E-06	4.07E-06	7.52E-07	4.88E-03	1.00E-05	4.24E-06	3.45E-06	1.42E-03	1.98E-07	3.08E-06	1.24E-07	8.06E-04	0.00	campus
548020	4179560	1.97E-04	6.96E-11	1.08E-05	1.08E-08	3.57E-05	2.46E-03	1.43E-10	0.00E+00	1.70E-03	9.55E-06	1.07E-06	5.70E-05	5.29E-07	1.98E-09	0.00E+00	7.92E-12	3.09E-03	0.00E+00	7.42E-06	6.95E-06	1.23E-06	8.37E-03	1.73E-05	7.26E-06	5.92E-06	2.48E-03	3.46E-07	5.38E-06	2.12E-07	1.35E-03	0.00	pot res
548000	4179600	2.52E-04	8.64E-11	1.29E-05	1.29E-08	3.96E-05	2.68E-03	1.57E-10	0.00E+00	1.90E-03	1.06E-05	1.19E-06	6.34E-05	5.88E-07	2.22E-09	0.00E+00	8.80E-12	3.44E-03	0.00E+00	8.25E-06	5.34E-06	9.88E-07	6.40E-03	1.30E-05	5.54E-06	4.52E-06	1.86E-03	2.67E-07	2.30E-06	1.52E-07	9.44E-06	2.08E-06	1.62E-06	0.00	pot res
548000	4179620	2.60E-04	8.93E-11	1.33E-05	1.33E-08	4.09E-05	2.75E-03	1.61E-10	0.00E+00	1.94E-03	1.09E-05	1.21E-06	6.48E-05	6.01E-07	2.23E-09	0.00E+00	9.00E-12	3.52E-03	0.00E+00	8.43E-06	5.49E-06	1.04E-06	6.66E-03	1.34E-05	3.07E-06	4.78E-06	1.90E-03	3.20E-07	4.16E-06	1.67E-07	1.09E-03	0.00	campus
548000	4179640	2.63E-04	9.04E-11	1.34E-05	1.34E-08	4.13E-05	2.78E-03	1.63E-10	0.00E+00	1.96E-03	1.10E-05	1.22E-06	6.55E-05	6.07E-07	2.25E-09	0.00E+00	9.09E-12	3.56E-03	0.00E+00	8.52E-06	5.46E-06	1.04E-06	6.62E-03	1.33E-05	3.05E-06	4.75E-06	1.89E-03	3.18E-07	4.13E-06	1.66E-07	1.08E-03	0.00	pot res
548000	4179660	2.32E-04	7.84E-11	1.17E-05	1.17E-08	3.59E-05	2.44E-03	1.42E-10	0.00E+00	1.72E-03	9.64E-06	1.08E-06	5.75E-05	5.33E-07	1.99E-09	0.00E+00	7.98E-12	3.12E-03	0.00E+00	7.48E-06	7.72E-06	1.42E-06	2.43E-05	9.23E-08	1.89E-06	8.01E-06	6.53E-06	2.68E-06	1.33E-06	2.54E-06	1.03E-07	1.30E-03	0.00	campus
548000	4179700	2.17E-04	8.17E-11	1.22E-05	1.22E-08	3.74E-05	2.55E-03	1.49E-10	0.00E+00	1.79E-03	1.01E-05	1.13E-06	6.06E-05	5.56E-07	2.08E-09	0.00E+00	8.32E-12	3.26E-03	0.00E+00	7.80E-06	5.20E-06	9.63E-07	6.04E-03	1.29E-05	5.49E-06	4.29E-06	1.84E-03	2.41E-07	3.99E-06	1.57E-07	1.01E-03	0.00	campus
548000	4179720	2.13E-04	7.54E-11	1.12E-05	1.12E-08	3.45E-05	2.35E-03	1.37E-10	0.00E+00	1.65E-03	9.28E-06	1.04E-06	5.54E-05	5.13E-07	1.92E-09	0.00E+00	7.68E-12	3.00E-03	0.00E+00	7.20E-06	4.83E-06	8.94E-07	5.79E-03	1.18E-05	5.01E-06	4.09E-06	1.68E-03	2.42E-07	2.08E-06	1.38E-07	8.54E-06	1.88E-06	1.47E-06	0.00	campus
548000	4179760	2.81E-04	1.03E-10	1.51E-05	1.52E-08	4.66E-05	3.17E-03	1.85E-10	0.00E+00	2.23E-03	1.25E-05	1.40E-06	7.47E-05	6.93E-07	2.59E-09	0.00E+00	1.04E-11	4.05E-03	0.00E+00	9.72E-06	3.45E-06	6.12E-07	4.05E-03	8.55E-06	3.62E-06	2.87E-06	1.21E-03	1.19E-07	1.97E-06	1.37E-07	2.44E-06	9.48E-06	5.92E-06	0.00	pot res
548000	4179740	2.40E-04	8.86E-11	1.34E-05	1.34E-08	4.14E-05	2.84E-03	1.64E-10	0.00E+00	2.15E-03	1.20E-05	1.34E-06	7.21E-05	6.68E-07	2.44E-09	0.00E+00	9.96E-12	4.09E-03	0.00E+00	9.24E-06	6.56E-06	1.17E-06	8.87E-03	1.64E-05	5.75E-06	4.61E-06	2.02E-03	2.69E-07	4.18E-06	1.68E-07	1.09E-03	0.00	pot res
548000	4179760	2.63E-04	9.71E-11	1.46E-05	1.46E-08	4.53E-05	3.11E-03	1.80E-10	0.00E+00	2.36E-03	1.31E-05	1.47E-06	7.90E-05	7.32E-07	2.67E-09	0.00E+00	1.09E-11	4.48E-03	0.00E+00	1.01E-05	7.19E-06	1.28E-06	9.72E-03	1.80E-05	6.30E-06	5.05E-06	2.21E-03	2.95E-07	4.58E-06	1.84E-07	1.19E-03	0.00	pot res
548000	4179780	2.52E-04	9.29E-11	1.36E-05	1.37E-08	4.18E-05	2.85E-03	1.66E-10	0.00E+00	2.00E-03	1.12E-05	1.26E-06	6.71E-05	6.22E-07	2.32E-09	0.00E+00	9.35E-12	3.74E-03	0.00E+00	8.73E-06	3.10E-06	5.50E-07	3.64E-03	7.68E-06	3.25E-06	2.58E-06	1.09E-03	1.07E-07	1.77E-06	1.23E-07	2.19E-06	8.51E-06	5.32E-06	0.00	pot res
548020	4179560	2.13E-04	7.54E-11	1.12E-05	1.12E-08	3.45E-05	2.35E-03	1.37E-10	0.00E+00	1.65E-03	9.28E-06	1.04E-06	5.54E-05	5.13E-07	1.92E-09	0.00E+00	7.68E-12	3.00E-03	0.00E+00	7.20E-06	4.83E-06	8.94E-07	5.79E-03	1.18E-05	5.01E-06	4.09E-06	1.68E-03	2.42E-07	2.08E-06	1.38E-07	8.54E-06	1.88E-06	1.47E-06	0.00	campus
548020	4179580	2.04E-04	7.24E-11	1.08E-05	1.08E-08	3.31E-05	2.25E-03	1.32E-10	0.00E+00	1.59E-03	8.90E-06	9.95E-07	5.31E-05	4.93E-07	1.84E-09	0.00E+00	7.37E-12	2.88E-03	0.00E+00	6.91E-06	4.07E-06	7.52E-07	4.88E-03	1.00E-05	4.24E-06	3.45E-06	1.42E-03	1.98E-07	3.08E-06	1.24E-07	8.06E-04	0.00	campus
548020	4179600	1.97E-04	6.96E-11	1.08E-05	1.08E-08	3.57E-05	2.46E-03	1.43E-10	0.00E+00	1.70E-03	9.55E-06	1.07E-06	5.70E-05	5.29E-07	1.98E-09	0.00E+00	7.92E-12	3.09E-03	0.00E+00	7.42E-06	6.95E-06	1.23E-06	8.37E-03	1.73E-05	7.26E-06	5.92E-06	2.48E-03	3.46E-07	5.38E-06	2.12E-07	1.35E-03	0.00	pot res
548020	4179620	2.23E-04	7.74E-11	1.15E-05	1.15E-08	3.54E-05	2.41E-03	1.35E-10	0.00E+00	1.63E-03	9.14E-06	1.02E-06	5.45E-05	5.06E-07	1.89E-09	0.00E+00	7.56E-12	2.96E-03	0.00E+00	7.09E-06	3.03E-06	5.61E-07	3.64E-03	7.43E-06	3.15E-06	2.57E-06	1.09E-03	1.50E-07	2.10E-06	9.12E-06	5.36E-06	0.00	pot res
548020	4179640	2.63E-04	9.04E-11	1.34E-05	1.34E-08	4.13E-05	2.78E-03	1.63E-10	0.00

UCSF Parnassus Heights LRDP
Initial Phase of LRDP (2030)
Operational Inhalation Acute Hazard Index for Residential Receptor

Acute Hazard Quotient = 1-hour Max Concentration / Acute REL

Pollutant Concentrations by Source

Unique Identifier	Emission Source		Fume Hoods												PCUP									Total Hazard Index	Receptor Type Determination	
	Chronic REL (ug/m^3)		0.2	27	240	1900	150	3000	55	0.6	0.6	14000	0.2	120	180000	470	2.5	3200	27	660	55	470	3100	37000	22000			
	UTM X	UTM Y	Arsenic (ug/m^3)	Benzene (ug/m^3)	Benzyl chloride (ug/m^3)	arbon tetrachlorid (ug/m^3)	Chloroform (ug/m^3)	Dioxane, 1,4- (ug/m^3)	ormaldehyd (ug/m^3)	ercury and compoun (ug/m^3)	Mercuric chloride (ug/m^3)	ethylene chlori (ug/m^3)	Nickel (ug/m^3)	ulfuric acid/Oleu (ug/m^3)	Vinyl chloride (ug/m^3)	Acetaldehyde (ug/m^3)	Acrolein (ug/m^3)	Ammonia (ug/m^3)	Benzene (ug/m^3)	1,3-Butadiene (ug/m^3)	Formaldehyde (ug/m^3)	Propylene oxide (ug/m^3)	Toluene (ug/m^3)	Xylene (ug/m^3)			
547640 4179660	547640	4179660	5.12E-09	7.61E-04	1.74E-06	2.34E-03	1.59E-01	1.12E-03	3.75E-03	0.00E+00	5.21E-10	2.04E-01	0.00E+00	5.83E-05	0.00E+00	1.02E-04	1.79E-05	1.19E-01	2.51E-04	1.07E-06	3.57E-02	4.87E-02	7.20E-05	2.76E-06	1.74E-04	0.00	Campus	
547660, 4179660	547660	4179660	4.51E-09	6.71E-04	1.54E-06	2.07E-03	1.41E-01	9.90E-04	3.31E-03	0.00E+00	4.59E-10	1.80E-01	0.00E+00	5.14E-05	0.00E+00	1.09E-04	1.92E-05	1.27E-01	2.70E-04	1.15E-06	3.84E-02	5.18E-02	7.74E-05	2.97E-06	1.86E-04	0.00	Campus	
547640 ,4179640	547640	4179640	4.94E-09	7.35E-04	1.68E-06	2.26E-03	1.54E-01	1.08E-03	3.63E-03	0.00E+00	5.03E-10	1.97E-01	0.00E+00	5.63E-05	0.00E+00	9.25E-05	1.66E-05	1.09E-01	2.28E-04	9.68E-07	3.24E-02	4.77E-02	6.53E-05	2.50E-06	1.60E-04	0.00	Campus	
547640 ,4179680	547640	4179680	4.96E-09	7.38E-04	1.69E-06	2.27E-03	1.55E-01	1.09E-03	3.64E-03	0.00E+00	5.05E-10	1.98E-01	0.00E+00	5.65E-05	0.00E+00	8.91E-05	1.57E-05	1.04E-01	2.21E-04	9.37E-07	3.14E-02	4.22E-02	6.32E-05	2.43E-06	1.52E-04	0.00	Campus	
547620 ,4179640	547620	4179640	5.12E-09	7.62E-04	1.75E-06	2.35E-03	1.60E-01	1.12E-03	3.76E-03	0.00E+00	5.21E-10	2.04E-01	0.00E+00	5.83E-05	0.00E+00	8.11E-05	1.44E-05	9.52E-02	2.01E-04	8.52E-07	2.85E-02	4.00E-02	5.74E-05	2.20E-06	1.39E-04	0.00	Campus	
547660 ,4179680	547660	4179680	4.34E-09	6.45E-04	1.48E-06	1.99E-03	1.35E-01	9.51E-04	3.18E-03	0.00E+00	4.41E-10	1.73E-01	0.00E+00	4.94E-05	0.00E+00	9.99E-05	1.76E-05	1.17E-01	2.47E-04	1.05E-06	3.51E-02	4.71E-02	7.09E-05	2.69E-06	1.70E-04	0.00	Campus	
547640 ,4179700	547640	4179700	4.96E-09	7.38E-04	1.69E-06	2.27E-03	1.55E-01	1.09E-03	3.64E-03	0.00E+00	5.05E-10	1.98E-01	0.00E+00	5.65E-05	0.00E+00	8.14E-05	1.41E-05	9.43E-02	2.02E-04	8.60E-07	2.88E-02	3.62E-02	5.80E-05	2.24E-06	1.37E-04	0.00	Campus	
547620 ,4179660	547620	4179660	4.91E-09	7.30E-04	1.67E-06	2.25E-03	1.53E-01	1.08E-03	3.60E-03	0.00E+00	5.00E-10	1.95E-01	0.00E+00	5.59E-05	0.00E+00	7.85E-05	1.39E-05	9.21E-02	1.94E-04	8.24E-07	2.76E-02	3.86E-02	5.56E-05	2.13E-06	1.35E-04	0.00	Campus	
547660 ,4179640	547660	4179640	4.00E-09	5.96E-04	1.37E-06	1.83E-03	1.25E-01	8.78E-04	2.94E-03	0.00E+00	4.08E-10	1.59E-01	0.00E+00	4.56E-05	0.00E+00	1.03E-04	1.83E-05	1.21E-01	2.54E-04	1.08E-06	3.61E-02	5.11E-02	7.27E-05	2.78E-06	1.77E-04	0.00	Campus	
547600 ,4179640	547600	4179640	5.47E-09	8.14E-04	1.87E-06	2.51E-03	1.71E-01	1.20E-03	4.02E-03	0.00E+00	5.57E-10	2.18E-01	0.00E+00	6.23E-05	0.00E+00	5.45E-05	9.64E-06	6.38E-02	1.35E-04	5.73E-07	1.92E-02	2.65E-02	3.86E-05	1.49E-06	9.33E-05	0.00	Campus	
547620 ,4179620	547620	4179620	4.53E-09	6.75E-04	1.55E-06	2.08E-03	1.41E-01	9.95E-04	3.33E-03	0.00E+00	4.62E-10	1.81E-01	0.00E+00	5.16E-05	0.00E+00	7.83E-05	1.39E-05	9.19E-02	1.94E-04	8.23E-07	2.76E-02	3.83E-02	5.55E-05	2.15E-06	1.34E-04	0.00	Campus	
547620 ,4179540	547620	4179540	5.50E-09	8.18E-04	1.87E-06	2.52E-03	1.71E-01	1.21E-03	4.03E-03	0.00E+00	5.60E-10	2.19E-01	0.00E+00	6.26E-05	0.00E+00	5.00E-05	8.75E-06	5.83E-02	1.24E-04	5.27E-07	1.76E-02	2.32E-02	3.55E-05	1.34E-06	8.50E-05	0.00	Campus	
547620 ,4179680	547620	4179680	4.91E-09	7.30E-04	1.67E-06	2.25E-03	1.53E-01	1.08E-03	3.60E-03	0.00E+00	5.00E-10	1.95E-01	0.00E+00	5.59E-05	0.00E+00	6.64E-05	1.17E-05	7.75E-02	1.65E-04	6.99E-07	2.34E-02	3.13E-02	4.71E-05	1.81E-06	1.13E-04	0.00	Campus	
547600 ,4179540	547600	4179540	5.06E-09	7.53E-04	1.73E-06	2.32E-03	1.58E-01	1.11E-03	3.71E-03	0.00E+00	5.15E-10	2.02E-01	0.00E+00	5.76E-05	0.00E+00	5.67E-05	9.90E-06	6.60E-02	1.41E-04	5.98E-07	2.00E-02	2.61E-02	4.03E-05	1.56E-06	9.62E-05	0.00	Campus	
547640 ,4179560	547640	4179560	2.66E-09	3.96E-04	9.08E-07	1.22E-03	8.30E-02	5.84E-04	1.95E-03	0.00E+00	2.71E-10	1.06E-01	0.00E+00	3.03E-05	0.00E+00	1.19E-04	2.24E-05	1.44E-01	2.92E-04	1.23E-06	4.14E-02	7.34E-02	8.29E-05	3.28E-06	2.13E-04	0.00	Campus	
547960 ,4179600	547960	4179600	2.99E-09	4.41E-04	1.01E-06	1.36E-03	9.24E-02	6.52E-04	2.18E-03	0.00E+00	3.02E-10	1.18E-01	0.00E+00	3.37E-05	0.00E+00	1.09E-04	2.04E-05	1.31E-01	2.68E-04	1.13E-06	3.80E-02	6.59E-02	7.60E-05	3.05E-06	1.94E-04	0.00	Campus	
547960 ,4179540	547960	4179540	2.41E-09	3.59E-04	8.22E-07	1.10E-03	7.51E-02	5.29E-04	1.77E-03	0.00E+00	2.45E-10	9.60E-02	0.00E+00	2.74E-05	0.00E+00	1.24E-04	2.28E-05	1.48E-01	3.06E-04	1.29E-06	4.34E-02	7.04E-02	8.68E-05	3.45E-06	2.18E-04	0.00	Campus	
547520 ,4179540	547520	4179540	5.51E-09	8.20E-04	1.88E-06	2.52E-03	1.72E-01	1.21E-03	4.04E-03	0.00E+00	5.61E-10	2.19E-01	0.00E+00	6.27E-05	0.00E+00	3.64E-05	6.49E-06	4.28E-02	9.02E-05	3.83E-07	1.28E-02	1.81E-02	2.58E-05	9.93E-07	6.27E-05	0.00	Campus	
547960 ,4179580	547960	4179580	2.86E-09	4.25E-04	9.74E-07	1.31E-03	8.90E-02	6.26E-04	2.10E-03	0.00E+00	2.91E-10	1.14E-01	0.00E+00	3.25E-05	0.00E+00	1.09E-04	2.07E-05	1.32E-01	2.68E-04	1.13E-06	3.80E-02	6.90E-02	7.59E-05	3.04E-06	1.99E-04	0.00	Campus	
547640 ,4179540	547640	4179540	5.17E-09	7.69E-04	1.76E-06	2.37E-03	1.61E-01	1.13E-03	3.80E-03	0.00E+00	5.26E-10	2.06E-01	0.00E+00	5.89E-05	0.00E+00	4.53E-05	7.93E-06	5.28E-02	1.12E-04	4.78E-07	1.60E-02	2.10E-02	3.22E-05	1.22E-06	7.70E-05	0.00	Campus	
547520 ,4179560	547520	4179560	5.48E-09	8.15E-04	1.87E-06	2.51E-03	1.71E-01	1.20E-03	4.02E-03	0.00E+00	5.58E-10	2.18E-01	0.00E+00	6.24E-05	0.00E+00	3.60E-05	6.40E-06	4.23E-02	8.90E-05	3.77E-07	1.26E-02	1.79E-02	2.55E-05	9.80E-07	6.18E-05	0.00	Campus	
547960 ,4179520	547960	4179520	2.34E-09	3.48E-04	7.97E-07	1.07E-03	7.28E-02	5.13E-04	1.72E-03	0.00E+00	2.38E-10	9.31E-02	0.00E+00	2.66E-05	0.00E+00	1.26E-04	2.24E-05	1.48E-01	3.12E-04	1.32E-06	4.43E-02	6.23E-02	8.93E-05	3.44E-06	2.17E-04	0.00	Campus	
547600 ,4179660	547600	4179660	4.94E-09	7.35E-04	1.68E-06	2.26E-03	1.54E-01	1.08E-03	3.63E-03	0.00E+00	5.03E-10	1.97E-01	0.00E+00	5.63E-05	0.00E+00	5.02E-05	8.79E-06	5.85E-02	1.25E-04	5.29E-07	1.77E-02	2.33E-02	3.57E-05	1.37E-06	8.53E-05	0.00	Campus	
547640 ,4179620	547640	4179620	3.56E-09	5.30E-04	1.21E-06	1.63E-03	1.11E-01	7.81E-04	2.61E-03	0.00E+00	3.62E-10	1.42E-01	0.00E+00	4.05E-05	0.00E+00	8.83E-05	1.57E-05	1.04E-01	2.19E-04	9.26E-07	3.11E-02	4.44E-02	6.24E-05	2.44E-06	1.52E-04	0.00	Campus	
547660 ,4179700	547660	4179700	3.26E-09	4.84E-04	1.11E-06	1.49E-03	1.01E-01	7.14E-04	2.39E-03	0.00E+00	3.31E-10	1.30E-01	0.00E+00	3.71E-05	0.00E+00	9.64E-05	1.66E-05	1.12E-01	2.39E-04	1.01E-06	3.41E-02	4.20E-02	6.88E-05	2.61E-06	1.62E-04	0.00	Campus	
547660 ,4179600	547660	4179600	3.61E-09	5.37E-04	1.23E-06	1.65E-03	1.12E-01	7.91E-04	2.65E-03	0.00E+00	3.67E-10	1.44E-01	0.00E+00	4.11E-05	0.00E+00	8.42E-05	1.49E-05	9.87E-02	2.09E-04	8.85E-07	2.96E-02	4.10E-02	5.97E-05	2.30E-06	1.44E-04	0.00	Campus	
547540 ,4179580	547540	4179580	5.14E-09	7.65E-04	1.75E-06	2.36E-03	1.60E-01	1.13E-03	3.78E-03	0.00E+00	5.24E-10	2.05E-01	0.00E+00	5.86E-05	0.00E+00	3.98E-05	7.06E-06	4.67E-02	9.83E-05	4.16E-07	1.40E-02	1.96E-02	2.82E-05	1.08E-06	6.83E-05	0.00	Campus	
547960 ,4179680	547960	4179680	4.70E-09	6.99E-04	1.60E-06	2.15E-03	1.46E-01	1.03E-03	3.45E-03	0.00E+00	4.78E-10	1.87E-01	0.00E+00	5.36E-05	0.00E+00	5.20E-05	9.04E-06	6.04E-02	1.28E-04	5.50E-07	1.84E-02	2.70E-02	3.71E-05	1.43E-06	8.80E-05	0.00	Campus	
547520 ,4179520	547520	4179520	5.29E-09	7.87E-04	1.80E-06	2.42E-03	1.65E-01	1.16E-03	3.88E-03	0.00E+00	5.38E-10	2.11E-01	0.00E+00	6.02E-05	0.00E+00	3.37E-05	5.99E-06	3.95E-02	8.31E-05	3.53E-07	1.18E-02	1.67E-02	2.38E-05	9.08E-07	5.79E-05	0.00	Campus	
547520 ,4179500	547520	4179500	5.35E-09	7.96E-04	1.82E-06	2.45E-03	1.67E-01	1.17E-03	3.92E-03	0.00E+00	5.44E-10	2.13E-01	0.00E+00	6.09E-05	0.00E+00	3.13E-05	5.56E-06	3.68E-02	7.74E-05	3.29E-07	1.10E-02	1.54E-02	2.22E-05	8.47E-07	5.38E-05	0.00	Campus	
547540 ,4179520	547540	4179520	4.71E-09	7.01E-04	1.61E-06	2.16E-03	1.47E-01	1.03E-03	3.46E-03	0.00E+00	4.80E-10	1.88E-01	0.00E+00	5.38E-05	0.00E+00	4.82E-05	8.36E-06	5.59E-02	1.20E-04	5.10E-07	1.70E-02	2.50E-02	3.44E-05	1.31E-06	8.15E-05	0.00	Campus	
547640 ,4179600	547640	4179600	3.41E-09	5.07E-04	1.16E-06	1.56E-03	1.06E-01	7.47E-04	2.50E-03	0.00E+00	3.47E-10	1.36E-01	0.00E+00	3.88E-05	0.00E+00	8.40E-05	1.49E-05	9.86E-02	2.08E-04	8.83E-07	2.96E-02	4.12E-02	5.95E-05	2.29E-06	1.44E-04	0.00	Campus	
547660 ,4179620	547660	4179620	3.21E-09	4.78E-04	1.09E-06	1.47E-03	1.00E-01	7.04E-04	2.36E-03	0.00E+00	3.27E-10	1.28E-01	0.00E+00	3.66E-05	0.00E+00	8.93E-05	1.59E-05	1.05E-01	2.21E-04	9.37E-07	3.14E-02	4.49E-02	6.31E-05	2.46E-06	1.54E-04	0.00	Campus	
547600 ,4179620	547600	4179620	4.07E-09	6.05E-04	1.39E-06	1.88E-03	1.27E-01	8.92E-04	2.98E-03	0.00E+00	4.14E-10	1.62E-01	0.00E+00	4.63E-05	0.00E+00	6.22E-05	1.10E-05	7.29E-02	1.54E-04	6.54E-07	2.19E-02	3.01E-02	4.41E-05	1.70E-06	1.06E-04	0.00	Campus	
547700 ,4179640	547700	4179640	2.14E-09	3.19E-04	7.31E-07	8.82E-04	6.68E-02	4.70E-04	1.57E-03	0.00E+00	2.18E-10	8.53E-02	0.00E+00	2.44E-05	0.00E+00	1.18E-04	2.07E-05	1.37E-01	2.91E-04	1.24E-06	4.16E-02	5.58E-02	8.34E-05	3.20E-06	2.01E-04	0.00	Campus	
547620 ,4179700	547620	4179700	4.38E-09	6.52E-04	1.49E-06	2.01E-03	1.37E-01	9.61E-04	3.22E-03	0.00E+00	4.46E-10	1.75E-01	0.00E+00	4.99E-05	0.00E+00	5.29E-05	9.20E-06	6.14E-02	1.32E-04	5.58E-07	1.87E-02	2.39E-02	3.77E-05	1.45E-06	8.95E-05	0.00	Campus	
547680 ,4179660	547680	4179660	2.47E-09	3.68E-04	8.43E-07	1.13E-03	7.71E-02	5.43E-04	1.82E-03	0.00E+00	2.52E-10	9.85E-02	0.00E+00	2.82E-05	0.00E+00	1.07E-04	1.89E-05	1.26E-01	2.66E-04	1.13E-06	3.78E-02	5.11E-02	7.62E-05	2.92E-06	1.83E-04	0.00	Campus	
547680 ,4179680	547680	4179680	2.49E-09	3.71E-04	8.49E-07	1.14E-03	7.76E-02	5.46E-04	1.83E-03	0.00E+00	2.54E-10	9.92E-02	0.00E+00	2.84E-05	0.00E+00	1.08E-04	1.86E-05	1.25E-01	2.67E-04	1.14E-06	3.80E-02	4.76E-02	7.68E-05	2.90E-06	1.82E-04	0.00	Campus	
547580 ,4179660	547580	4179660	4.53E-09	6.74E-04	1.54E-06	2.07E-03	1.41E-01	9.93E-04	3.32E-03	0.00E+00	4.61E-10	1.80E-01	0.00E+00	5.16E-05	0.00E+00	4.76E-05	8.33E-06	5.55E-02	1.18E-04	5.01E-07	1.68E-02	2.22E-02	3.38E-05	1.31E-06	8.09E-05	0.00	Campus	
547660 ,4179580	547660	4179580	3.38E-09	5.02E-04	1.15E-06	1.55E-03	1.05E-01	7.41E-04	2.48E-03	0.00E+00	3.44E-10	1.35E-01	0.00E+00	3.85E-05	0.00E+00	8.06E-05	1.41E-05	9.39E-02	2.00E-04	8.50E-07	2.84E-02	3.73E-02	5.73E-05	2.19E-06	1.37E-04	0.00	Campus	
547520 ,4179580	547520	4179580	4.88E-09	7.23E-04	1.66E-06	2.24E-03	1.59E-01	1.07E-03	3.57E-03	0.00E+00	4.95E-10	1.93E-01	0.00E+00	5.55E-05	0.00E+00	3.63E-05	6.45E-06	4.26E-02	8.97E-05	3.81E-07	1.27E-02	1.80E-02	2.57E-05	9.83E-07	6.23E-05	0.00	Campus	
547580 ,4179640	547580	4179640	4.53E-09	6.73E-04	1.54E-06	2.07E-03	1.41E-01	9.93E-04	3.32E-03	0.00E+00	4.61E-10	1.80E-01	0.00E+00	5.15E-05	0.00E+00	4.54E-05	8.00E-06	5.31E-02	1.13E-04	4.78E-07	1.60E-02	2.17E-02	3.22E-05	1.24E-06	7.75E-05	0.00	Campus	
547600 ,4179720	547600	4179720	4.53E-09	6.74E-04	1.54E-06	2.07E-03	1.41E-01	9.93E-04	3.32E-03	0.00E+00	4.61E-10	1.80E-01	0.00E+00	5.15E-05	0.00E+00	4.47E-05	7.74E-06	5.18E-02	1.11E-04	4.73E-07	1.58E-02	1.97E-02	3.19E-05	1.22E-06	7.54E-05	0.00	3rd Ave Housing	Res Hall
547580 ,4179640	547580	4179640	4.92E-09	8.88E-04	1.58E-06	2.12E-03	1.44E-01	1.01E-03	3.39E-03	0.00E+00	4.71E-10	1.94E-01	0.00E+00	5.26E-05	0.00E+00	4.13E-05	7.30E-06	4.84E-02	1.02E-04	4.34E-07	1.45E-02	2.00E-02	2.93E-05	1.13E-06	7.07E-05	0.00	Campus	
547540 ,4179560	547540	4179560	4.69E-09	6.98E-04	1.60E-06	2.15E-03	1.46E-01	1.03E-03	3.44E-03	0.00E+00	4.77E-10	1.87E-01	0.00E+00	5.34E-05	0.00E+00	3.93E-05	6.99E-06	4.62E-02	9.73E-05	4.13E-07	1.38E-02	1.95E-02	2.78E-05	1.07E-06	6.75E-05	0.00	campus	
547620 ,4179600	547620	4179600	3.24E-09	4.82E-04	1.10E-06	1.48E-03	1.01E-01	7.10E-04	2.38E-03	0.00E+00	3.30E-10	1.29E-01	0.00E+00	3.69E-05	0.00E+00	8.08E-05	1.43E-05	9.47E-02	2.00E-04	8.50E-07	2.85E-02	3.92E-02	5.73E-05	2.20E-06	1.38E-04	0.00	campus	
547640 ,4179500	547640	4179500	4.13E-09	6.14E-04	1.41E-06	1.89E-03	1.29E-01	9.06E-04	3.03E-03	0.00E+00	4.20E-10	1.64E-01	0.00E+00	4.70E-05	0.00E+00	5.53E-05	9.60E-06	6.42E-02	1.37E-04	5.83E-07	1.95E-02	2.48E-02	3.93E-05	1.50E-06	9.35E-05	0.00	campus	
547720 ,4179640	547720	4179640	2.28E-09	3.39E-04	7.76E-07	1.04E-03	7.09E-02	4.99E-04	1.67E-03	0.00E+00	2.32E-10	9.06E-02	0.00E+00	2.59E-05	0.00E+00	1.08E-04	1.90E-05	1.26E-01	2.68E-04	1.14E-06	3.81E-02	5.14E-02	7.68E-05	2.95E-06	1.85E-04	0.00	campus	
547680 ,4179640	547680	4179640	2.24E-09	3.34E-04	7.65E-07	1.03E-03	6.99E-02	4.92E-04	1.65E-03	0.00E+00	2.28E-10	8.94E-02	0.00E+00	2.56E-05	0.00E+00	1.08E-04	1.92E-05	1.27E-01	2.67E-04	1.14E-06	3.80E-02	5.36E-02	7.66E-05	2.94E-06	1.86E-04	0.00	campus	
547600 ,4179580	547600	4179580	3.49E-09	5.20E-04	1.19E-06	1.60E-03	1.09E-01	7.66E-04	2.56E-03	0.00E+00	3.56E-10	1.39E-01	0.00E+00	3.98E-05	0.00E+00	7.10E-05	1.25E-05	8.28E-02	1.76E-04	7.49E-07	2.50E-02	3.34E-02	5.04E-05	1.93E-06	1.21E-04	0.00	campus	
547860 ,4179640	547860	4179640	3.12E-09	4.65E-04	1.06E-06	1.43E-03	9.73E-02	6.85E-04	2.29E-03	0.00E+00	3.18E-10	1.24E-01	0.00E+00	3.56E-05	0.00E+00	8.06E-05	1.47E-05	9.57E-02	1.97E-04	8.41E-07	2.80E-02	4.35E-02	5.67E-05	2.10E-06	1.41E-04	0.00	campus	
547600 ,4179700	547600	4179700	4.20E-09	6.25E-04	1.43E-06	1.92E-03	1.31E-01	9.21E-04	3.08E-03	0.00E+00	4.27E-10	1.67E-01	0.00E+00	4.78E-05	0.00E+00	4.93E-05	8.50E-06	5.70E-02	1.23E-04	5.22E-07	1.75E-02	2.13E-02	3.52E-05	1.34E-06	8.30E-05	0.00	3rd Ave Housing	Res Hall
547620 ,4179620	547620	4179620	3.19E-09	4.74E-04	1.09E-06	1.46E-03	9.93E-02	6.99E-04	2.34E-03	0.00E+00	3.24E-10	1.27E-01	0.00E+00	3.63E-05	0.00E+00	7.79E-05	1.40E-05	9.21E-02	1.91E-04	8.11E-07	2.71E-02	4.03E-02	5.52E-05	2.01E-06	1.35E-04	0.00	campus	
547840 ,4179620	547840	4179620	3.20E-09	4.77E-04	1.09E-06	1.47E-03	9.99E-02	7.03E-04	2.35E-03	0.00E+00	3.26E-10	1.28E-01	0.00E+00	3.65E-05	0.00E+00	7.68E-05	1.40E-05	9.15E-02	1.87E-04	8.01E-07	2.65E-02	4.21E-02	5.40E-05	1.94E-06	1.35E-04	0.00	campus	
547620 ,4179580	547620	4179580	3.37E-09	5.01E-04	1.15E-06	1.54E-03	1.05E-01	7.38E-04	2.47E-03	0.00E+00	3.43E-10	1.34E-01	0.00E+00	3.83E-05	0.00E+00	7.26E-05	1.27E-05	8.47E-02	1.80E-04	7.64E-07	2.56E-02	3.42E-02	5.15E-05	1.97E-06	1.24E-04	0.00	campus	
547620 ,4179720	547620	4179720	4.15E-09	6.18E-04	1.42E-06	1.90E-03	1.29E-01	9.11E-04	3.05E-03	0.00E+00	4.23E-10	1.65E-01	0.00E+00	4.73E-05	0.00E+00	4.98E-05	8.72E-06	5.80E-02	1.24E-04	5.25E-07	1.76E-02	2.32E-02	3.54E-05	1.36E-06	8.47E-05	0.00	campus	
547640 ,4179560	547640	4179560	3.65E-09	5.43E-04	1.25E-06	1.67E-03	1.14E-01	8.01E-04	2.68E-03	0.00E+00	3.72E-10	1.44E-01	0.00E+00	4.16E-05	0.00E+00	4.44E-05	7.51E-06	5.12E-02	1.08E-04	4.71E-07	1.57E-02	2.27E-02	3.00E-05	1.16E-06	7.45E-05	0.00	campus	
547720 ,4179660	547720	4179660	2.16E-09	3.21E-04	7.36E-07	9.89E-04	6.73E-02	4.74E-04	1.59E-03	0.00E+00	2.20E-10	8.60E-02	0.00E+00	2.46E-05	0.00E+00	1.08E-04	1.87E-05	1.25E-01	2.67E-04	1.14E-06	3.79E-02	4.86E-02	7.66E-05	2.90E-06	1.82E-04	0.00	campus	
547660 ,4179540	547660	4179540	4.28E-09	6.36E-04	1.46E-06	1.96E-03	1.33E-01	9.38E-04	3.14E-03	0.00E+00	4.35E-10	1.70E-01	0.00E+00	4.87E-05	0.00E+00	4.56E-05	7.97E-06	5.31E-02	1.13E-04	4.81E-07	1.61E-02	2.11E-02	3.24E-05	1.24E-06	7.75E-05	0.00	campus	
547800 ,4179620	547800	4179620	3.09E-09	4.60E-04	1.05E-06	1.42E-03	9.64E-02	6.79E-04	2.27E-03	0.00E+00	3.15E-10	1.23E-01	0.00E+00	3.52E-05	0.00E+00	7.95E-05	1.42E-05	9.37E-02	1.95E-04	8.33E-07	2.77E-02	4.00E-02	5.61E-05	2.07E-06	1.37E-04	0.00	campus	
547680 ,4179700	547680	4179700	2.92E-09	4.35E-04	9.96E-07	1.34E-03	9.10E-02	6.41E-04	2.14E-03	0.00E+00	2.97E-10	1.16E-01	0.00E+00	3.33E-05	0.00E+00	8.47E-05	1.46E-05	9.80E-02	2.10E-04	8.95E-07	2.99E-02	3.70E-02	6.04E-05	2.29E-06	1.43E-04	0.00	campus	
547680 ,4179620	547680	4179620	3.23E-09	4.80E-04	1.10E-06	1.48E-03	1.01E-01	7.08E-04	2.37E-03	0.00E+00	3.28E-10	1.28E-01	0.00E+00	3.67E-05	0.00E+00	7.48E-05	1.37E-05	8.93E-02	1.81E-04	7.79E-07	2.58E-02	4.14E-02	5.25E-05	1.85E-06	1.31E-04	0.00	campus	
547840 ,4179640	547840	4179640	3.09E-09	4.54E-04	1.04E-06	1.40E-03	9.50E-02	6.69E-04	2.24E-03	0.00E+00	3.10E-10	1.21E-01	0.00E+00	3.47E-05	0.00E+00	7.92E-05	1.44E-05	9.41E-02	1.94E-04	8.27E-07	2.75E-02	4.27E-02	5.57E-05	2.07E-06	1.38E-04	0.00	campus	
547660 ,4179520

UCSF Parnassus Heights LRDP
Initial Phase of LRDP (2030)
Operational Annual Average $PM_{2.5}$ Exposure for Residential Receptor

For fume hoods, conservatively assume the following chemicals contribute to $PM_{2.5}$ emissions:

- Arsenic and compounds
- Benzidine
- Benzyl chloride
- Cadmium and compounds
- Chromium (VI)
- Hydrazine
- Manganese and compounds
- Mercuric chloride
- Nickel and compounds
- Sulfates
- Vinyl chloride
- Copper

Pollutant Concentrations by Source

	Emission Source		EDG	Fume Hoods													PCUP	Annual $PM_{2.5}$	
	UTM X	UTM Y	$PM_{2.5}$ (ug/m^3)	Arsenic (ug/m^3)	Benzidine (ug/m^3)	Benzyl chloride (ug/m^3)	Cadmium (ug/m^3)	Chromium (VI) (ug/m^3)	Hydrazine (ug/m^3)	ganese and compo (ug/m^3)	Mercuric chloride (ug/m^3)	Nickel (ug/m^3)	Sulfates (ug/m^3)	Vinyl chloride (ug/m^3)	Copper (ug/m^3)	$PM_{2.5}$ (ug/m^3)	Concentration (ug/m^3)	Receptor Type Determination
547960_4179580	547960	4179580	2.32E-04	8.26E-11	0.00E+00	2.82E-08	1.23E-08	1.50E-10	5.62E-07	2.10E-09	8.41E-12	0.00E+00	0.00E+00	0.00E+00	1.20E-09	7.36E-03	0.01	campus
547960 4179600	547960	4179600	2.52E-04	8.64E-11	0.00E+00	2.95E-08	1.29E-08	1.57E-10	5.88E-07	2.20E-09	8.80E-12	0.00E+00	0.00E+00	0.00E+00	1.26E-09	6.96E-03	0.01	campus
547960 4179560	547960	4179560	2.03E-04	7.67E-11	0.00E+00	2.61E-08	1.14E-08	1.39E-10	5.22E-07	1.95E-09	7.81E-12	0.00E+00	0.00E+00	0.00E+00	1.12E-09	6.48E-03	0.01	campus
547980 4179580	547980	4179580	2.24E-04	7.84E-11	0.00E+00	2.67E-08	1.17E-08	1.42E-10	5.33E-07	1.99E-09	7.98E-12	0.00E+00	0.00E+00	0.00E+00	1.14E-09	5.42E-03	0.01	pot. res.
547980 4179560	547980	4179560	1.98E-04	7.36E-11	0.00E+00	2.51E-08	1.10E-08	1.34E-10	5.01E-07	1.87E-09	7.49E-12	0.00E+00	0.00E+00	0.00E+00	1.07E-09	5.07E-03	0.01	pot. res.
547980 4179600	547980	4179600	2.40E-04	8.10E-11	0.00E+00	2.76E-08	1.21E-08	1.47E-10	5.52E-07	2.06E-09	8.25E-12	0.00E+00	0.00E+00	0.00E+00	1.18E-09	4.69E-03	0.00	pot. res.
547960 4179540	547960	4179540	1.79E-04	6.94E-11	0.00E+00	2.37E-08	1.04E-08	1.26E-10	4.73E-07	1.77E-09	7.07E-12	0.00E+00	0.00E+00	0.00E+00	1.01E-09	4.38E-03	0.00	campus
547980 4179540	547980	4179540	1.78E-04	6.73E-11	0.00E+00	2.30E-08	1.00E-08	1.22E-10	4.58E-07	1.71E-09	6.86E-12	0.00E+00	0.00E+00	0.00E+00	9.80E-10	4.08E-03	0.00	pot. res.
547880 4179740	547880	4179740	1.90E-04	7.05E-11	0.00E+00	2.40E-08	1.05E-08	1.28E-10	4.80E-07	1.79E-09	7.18E-12	0.00E+00	0.00E+00	0.00E+00	1.03E-09	4.02E-03	0.00	campus
547960 4179620	547960	4179620	2.60E-04	8.83E-11	0.00E+00	3.01E-08	1.32E-08	1.61E-10	6.01E-07	2.25E-09	9.00E-12	0.00E+00	0.00E+00	0.00E+00	1.29E-09	3.91E-03	0.00	campus
547900 4179740	547900	4179740	2.00E-04	7.24E-11	0.00E+00	2.47E-08	1.08E-08	1.32E-10	4.93E-07	1.84E-09	7.37E-12	0.00E+00	0.00E+00	0.00E+00	1.05E-09	3.94E-03	0.00	campus
547900 4179760	547900	4179760	1.80E-04	6.35E-11	0.00E+00	2.17E-08	9.47E-09	1.15E-10	4.32E-07	1.62E-09	6.47E-12	0.00E+00	0.00E+00	0.00E+00	9.24E-10	3.66E-03	0.00	campus
547880 4179760	547880	4179760	1.72E-04	6.27E-11	0.00E+00	2.14E-08	9.34E-09	1.14E-10	4.27E-07	1.60E-09	6.38E-12	0.00E+00	0.00E+00	0.00E+00	9.11E-10	3.61E-03	0.00	campus
547900 4179720	547900	4179720	2.17E-04	8.17E-11	0.00E+00	2.79E-08	1.22E-08	1.49E-10	5.56E-07	2.08E-09	8.32E-12	0.00E+00	0.00E+00	0.00E+00	1.19E-09	3.53E-03	0.00	campus
547880 4179720	547880	4179720	2.13E-04	8.24E-11	0.00E+00	2.81E-08	1.23E-08	1.50E-10	5.61E-07	2.10E-09	8.38E-12	0.00E+00	0.00E+00	0.00E+00	1.20E-09	3.51E-03	0.00	campus
548000 4179560	548000	4179560	1.92E-04	7.13E-11	0.00E+00	2.43E-08	1.06E-08	1.30E-10	4.85E-07	1.81E-09	7.26E-12	0.00E+00	0.00E+00	0.00E+00	1.04E-09	3.44E-03	0.00	pot. res.
548000 4179580	548000	4179580	2.13E-04	7.54E-11	0.00E+00	2.57E-08	1.12E-08	1.37E-10	5.13E-07	1.92E-09	7.68E-12	0.00E+00	0.00E+00	0.00E+00	1.10E-09	3.40E-03	0.00	pot. res.
547860 4179740	547860	4179740	1.79E-04	6.80E-11	0.00E+00	2.32E-08	1.01E-08	1.24E-10	4.63E-07	1.73E-09	6.92E-12	0.00E+00	0.00E+00	0.00E+00	9.89E-10	3.41E-03	0.00	campus
547980 4179620	547980	4179620	2.49E-04	8.18E-11	0.00E+00	2.79E-08	1.22E-08	1.49E-10	5.57E-07	2.08E-09	8.33E-12	0.00E+00	0.00E+00	0.00E+00	1.19E-09	3.20E-03	0.00	pot. res.
547920 4179780	547920	4179780	1.47E-04	5.37E-11	0.00E+00	1.83E-08	8.00E-09	9.76E-11	3.65E-07	1.37E-09	5.47E-12	0.00E+00	0.00E+00	0.00E+00	7.81E-10	3.20E-03	0.00	campus
547860 4179720	547860	4179720	2.17E-04	8.22E-11	0.00E+00	2.80E-08	1.22E-08	1.49E-10	5.59E-07	2.09E-09	8.37E-12	0.00E+00	0.00E+00	0.00E+00	1.20E-09	3.09E-03	0.00	campus
547900 4179780	547900	4179780	1.54E-04	5.63E-11	0.00E+00	1.92E-08	8.39E-09	1.02E-10	3.83E-07	1.43E-09	5.73E-12	0.00E+00	0.00E+00	0.00E+00	8.19E-10	3.15E-03	0.00	campus
547860 4179760	547860	4179760	1.54E-04	6.06E-11	0.00E+00	2.07E-08	9.04E-09	1.10E-10	4.13E-07	1.54E-09	6.17E-12	0.00E+00	0.00E+00	0.00E+00	8.82E-10	3.15E-03	0.00	campus
547940 4179780	547940	4179780	1.39E-04	5.25E-11	0.00E+00	1.79E-08	7.82E-09	9.54E-11	3.57E-07	1.34E-09	5.34E-12	0.00E+00	0.00E+00	0.00E+00	7.63E-10	3.10E-03	0.00	campus
548000 4179600	548000	4179600	2.28E-04	7.79E-11	0.00E+00	2.65E-08	1.16E-08	1.42E-10	5.30E-07	1.98E-09	7.93E-12	0.00E+00	0.00E+00	0.00E+00	1.13E-09	2.99E-03	0.00	pot. res.
548020 4179560	548020	4179560	1.87E-04	6.87E-11	0.00E+00	2.34E-08	1.02E-08	1.25E-10	4.67E-07	1.75E-09	6.99E-12	0.00E+00	0.00E+00	0.00E+00	9.99E-10	2.91E-03	0.00	pot. res.
548000 4179540	548000	4179540	1.73E-04	6.58E-11	0.00E+00	2.24E-08	9.82E-09	1.20E-10	4.48E-07	1.68E-09	6.70E-12	0.00E+00	0.00E+00	0.00E+00	9.58E-10	2.92E-03	0.00	pot. res.
548020 4179580	548020	4179580	2.04E-04	7.24E-11	0.00E+00	2.47E-08	1.08E-08	1.32E-10	4.93E-07	1.84E-09	7.37E-12	0.00E+00	0.00E+00	0.00E+00	1.05E-09	2.86E-03	0.00	pot. res.
547940 4179800	547940	4179800	1.24E-04	4.79E-11	0.00E+00	1.63E-08	7.14E-09	8.71E-11	3.26E-07	1.22E-09	4.88E-12	0.00E+00	0.00E+00	0.00E+00	6.97E-10	2.94E-03	0.00	pot. res.
547880 4179780	547880	4179780	1.53E-04	5.65E-11	0.00E+00	1.93E-08	8.42E-09	1.03E-10	3.85E-07	1.44E-09	5.75E-12	0.00E+00	0.00E+00	0.00E+00	8.22E-10	2.89E-03	0.00	campus
547960 4179800	547960	4179800	1.27E-04	4.75E-11	0.00E+00	1.62E-08	7.09E-09	8.64E-11	3.24E-07	1.21E-09	4.84E-12	0.00E+00	0.00E+00	0.00E+00	6.91E-10	2.90E-03	0.00	pot. res.
547960 4179780	547960	4179780	1.39E-04	5.22E-11	0.00E+00	1.78E-08	7.78E-09	9.49E-11	3.55E-07	1.33E-09	5.31E-12	0.00E+00	0.00E+00	0.00E+00	7.59E-10	2.85E-03	0.00	campus
547880 4179700	547880	4179700	2.45E-04	9.78E-11	0.00E+00	3.33E-08	1.46E-08	1.78E-10	6.66E-07	2.49E-09	9.96E-12	0.00E+00	0.00E+00	0.00E+00	1.42E-09	2.65E-03	0.00	campus
547920 4179800	547920	4179800	1.20E-04	4.79E-11	0.00E+00	1.63E-08	7.14E-09	8.70E-11	3.26E-07	1.22E-09	4.87E-12	0.00E+00	0.00E+00	0.00E+00	6.96E-10	2.76E-03	0.00	campus
547960 4179520	547960	4179520	1.55E-04	6.11E-11	0.00E+00	2.08E-08	9.10E-09	1.11E-10	4.16E-07	1.55E-09	6.22E-12	0.00E+00	0.00E+00	0.00E+00	8.88E-10	2.68E-03	0.00	campus
548020 4179540	548020	4179540	1.71E-04	6.38E-11	0.00E+00	2.17E-08	9.51E-09	1.16E-10	4.34E-07	1.62E-09	6.49E-12	0.00E+00	0.00E+00	0.00E+00	9.27E-10	2.66E-03	0.00	pot. res.
547900 4179700	547900	4179700	2.43E-04	9.32E-11	0.00E+00	3.18E-08	1.39E-08	1.69E-10	6.35E-07	2.37E-09	9.49E-12	0.00E+00	0.00E+00	0.00E+00	1.36E-09	2.58E-03	0.00	campus
547960 4179640	547960	4179640	2.52E-04	8.66E-11	0.00E+00	2.95E-08	1.29E-08	1.57E-10	5.88E-07	2.20E-09	8.82E-12	0.00E+00	0.00E+00	0.00E+00	1.26E-09	2.50E-03	0.00	campus
547980 4179520	547980	4179520	1.53E-04	5.99E-11	0.00E+00	2.04E-08	8.93E-09	1.09E-10	4.08E-07	1.53E-09	6.10E-12	0.00E+00	0.00E+00	0.00E+00	8.71E-10	2.59E-03	0.00	pot. res.
548020 4179600	548020	4179600	2.17E-04	7.45E-11	0.00E+00	2.54E-08	1.11E-08	1.35E-10	5.07E-07	1.90E-09	7.58E-12	0.00E+00	0.00E+00	0.00E+00	1.08E-09	2.53E-03	0.00	pot. res.
547840 4179740	547840	4179740	1.63E-04	6.61E-11	0.00E+00	2.25E-08	9.86E-09	1.20E-10	4.50E-07	1.68E-09	6.73E-12	0.00E+00	0.00E+00	0.00E+00	9.62E-10	2.52E-03	0.00	campus
547980 4179780	547980	4179780	1.37E-04	5.07E-11	0.00E+00	1.73E-08	7.56E-09	9.23E-11	3.45E-07	1.29E-09	5.17E-12	0.00E+00	0.00E+00	0.00E+00	7.38E-10	2.53E-03	0.00	pot. res.
547860 4179700	547860	4179700	2.81E-04	1.02E-10	0.00E+00	3.47E-08	1.52E-08	1.85E-10	6.93E-07	2.59E-09	1.04E-11	0.00E+00	0.00E+00	0.00E+00	1.48E-09	2.38E-03	0.00	campus
547940 4179820	547940	4179820	1.09E-04	4.31E-11	0.00E+00	1.47E-08	6.42E-09	7.84E-11	2.93E-07	1.10E-09	4.39E-12	0.00E+00	0.00E+00	0.00E+00	6.27E-10	2.49E-03	0.00	pot. res.
547900 4179800	547900	4179800	1.25E-04	4.83E-11	0.00E+00	1.65E-08	7.20E-09	8.78E-11	3.29E-07	1.23E-09	4.92E-12	0.00E+00	0.00E+00	0.00E+00	7.02E-10	2.45E-03	0.00	campus
547980 4179800	547980	4179800	1.27E-04	4.67E-11	0.00E+00	1.59E-08	6.96E-09	8.49E-11	3.18E-07	1.19E-09	4.75E-12	0.00E+00	0.00E+00	0.00E+00	6.79E-10	2.44E-03	0.00	pot. res.
547980 4179640	547980	4179640	2.43E-04	8.00E-11	0.00E+00	2.73E-08	1.19E-08	1.45E-10	5.44E-07	2.04E-09	8.14E-12	0.00E+00	0.00E+00	0.00E+00	1.16E-09	2.30E-03	0.00	pot. res.
548000 4179620	548000	4179620	2.35E-04	7.80E-11	0.00E+00	2.66E-08	1.16E-08	1.42E-10	5.31E-07	1.99E-09	7.94E-12	0.00E+00	0.00E+00	0.00E+00	1.13E-09	2.29E-03	0.00	pot. res.
547840 4179720	547840	4179720	2.10E-04	7.95E-11	0.00E+00	2.71E-08	1.19E-08	1.45E-10	5.41E-07	2.02E-09	8.10E-12	0.00E+00	0.00E+00	0.00E+00	1.16E-09	2.30E-03	0.00	campus
547860 4179780	547860	4179780	1.30E-04	5.32E-11	0.00E+00	1.81E-08	7.93E-09	9.67E-11	3.62E-07	1.35E-09	5.41E-12	0.00E+00	0.00E+00	0.00E+00	7.74E-10	2.37E-03	0.00	pot. res.
548040 4179580	548040	4179580	1.94E-04	6.96E-11	0.00E+00	2.37E-08	1.04E-08	1.27E-10	4.74E-07	1.77E-09	7.09E-12	0.00E+00	0.00E+00	0.00E+00	1.01E-09	2.30E-03	0.00	pot. res.
547840 4179760	547840	4179760	1.30E-04	5.82E-11	0.00E+00	1.98E-08	8.67E-09	1.06E-10	3.96E-07	1.48E-09	5.92E-12	0.00E+00	0.00E+00	0.00E+00	8.46E-10	2.32E-03	0.00	campus
547960 4179820	547960	4179820	1.11E-04	4.26E-11	0.00E+00	1.45E-08	6.35E-09	7.74E-11	2.90E-07	1.08E-09	4.33E-12	0.00E+00	0.00E+00	0.00E+00	6.19E-10	2.32E-03	0.00	pot. res.
548040 4179560	548040	4179560	1.79E-04	6.66E-11	0.00E+00	2.27E-08	9.93E-09	1.21E-10	4.53E-07	1.70E-09	6.78E-12	0.00E+00	0.00E+00	0.00E+00	9.69E-10	2.23E-03	0.00	pot. res.
547980 4179760	547980	4179760	1.55E-04	5.74E-11	0.00E+00	1.96E-08	8.55E-09	1.04E-10	3.91E-07	1.46E-09	5.84E-12	0.00E+00	0.00E+00	0.00E+00	8.34E-10	2.23E-03	0.00	pot. res.
548020 4179620	548020	4179620	2.23E-04	7.43E-11	0.00E+00	2.53E-08	1.11E-08	1.35E-10	5.06E-07	1.89E-09	7.56E-12	0.00E+00	0.00E+00	0.00E+00	1.08E-09	2.13E-03	0.00	pot. res.
548040 4179600	548040	4179600	2.07E-04	7.15E-11	0.00E+00	2.44E-08	1.07E-08	1.30E-10	4.86E-07	1.82E-09	7.28E-12	0.00E+00	0.00E+00	0.00E+00	1.04E-09	2.14E-03	0.00	pot. res.
547920 4179820	547920	4179820	1.05E-04	4.30E-11	0.00E+00	1.47E-08	6.42E-09	7.82E-11	2.93E-07	1.10E-09	4.38E-12	0.00E+00	0.00E+00	0.00E+00	6.26E-10	2.23E-03	0.00	pot. res.
548000 4179520	548000	4179520	1.50E-04	5.88E-11	0.00E+00	2.01E-08	8.77E-09	1.07E-10	4.01E-07	1.50E-09	5.99E-12	0.00E+00	0.00E+00	0.00E+00	8.56E-10	2.17E-03	0.00	pot. res.
548020 4179520	548020	4179520	1.49E-04	5.74E-11	0.00E+00	1.96E-08	8.56E-09	1.04E-10	3.91E-07	1.46E-09	5.84E-12	0.00E+00	0.00E+00	0.00E+00	8.35E-10	2.11E-03	0.00	pot. res.
548040 4179540	548040	4179540	1.65E-04	6.21E-11	0.00E+00	2.12E-08	9.26E-09	1.13E-10	4.23E-07	1.58E-09	6.32E-12	0.00E+00	0.00E+00	0.00E+00	9.04E-10	2.05E-03	0.00	pot. res.
548000 4179780	548000	4179780	1.34E-04	4.94E-11	0.00E+00	1.68E-08	7.36E-09	8.98E-11	3.36E-07	1.26E-09	5.03E-12	0.00E+00	0.00E+00	0.00E+00	7.18E-10	2.09E-03	0.00	pot. res.
547880 4179800	547880	4179800	1.24E-04	4.83E-11	0.00E+00	1.65E-08	7.21E-09	8.79E-11	3.29E-07	1.23E-09	4.92E-12	0.00E+00	0.00E+00	0.00E+00	7.03E-10	2.08E-03	0.00	campus
548000 4179760	548000	4179760	1.52E-04	5.62E-11	0.00E+00	1.92E-08	8.38E-09	1.02E-10	3.83E-07	1.43E-09	5.72E-12	0.00E+00	0.00E+00	0.00E+00	8.17E-10	2.03E-03	0.00	pot. res.
547960 4179740	547960	4179740	1.75E-04	6.36E-11	0.00E+00	2.17E-08	9.49E-09	1.16E-10	4.33E-07	1.62E-09	6.48E-12	0.00E+00	0.00E+00	0.00E+00	9.26E-10	2.01E-03	0.00	campus
547980 4179820	547980	4179820	1.13E-04	4.16E-11	0.00E+00	1.42E-08	6.20E-09	7.56E-11	2.83E-07	1.06E-09	4.24E-12	0.00E+00	0.00E+00	0.00E+00	6.05E-10	1.97E-03	0.00	pot. res.
548040 4179620	548040	4179620	2.12E-04	7.12E-11	0.00E+00	2.43E-08	1.06E-08	1.29E-10	4.85E-07	1.81E-09	7.25E-12	0.00E+00	0.00E+00	0.00E+00	1.04E-09	1.84E-03	0.00	pot. res.
548000 4179800	548000	4179800	1.25E-04	4.54E-11	0.00E+00	1.55E-08	6.76E-09	8.25E-11	3.09E-07	1.15E-09	4.62E-12	0.00E+00	0.00E+00	0.00E+00	6.60E-10	1.91E-03	0.00	pot. res.
548000 4179640	548000	4179640	2.32E-04	7.64E-11	0.00E+00	2.61E-08	1.14E-08	1.39E-10	5.20E-07	1.95E-09	7.78E-12	0.00E+00	0.00E+00	0.00E+00	1.11E-09	1.80E-03	0.00	pot. res.
547960 4179660	547960	4179660	2.44E-04	8.38E-11	0.00E+00	2.86E-08	1.25E-08	1.52E-10	5.71E-07	2.13E-09	8.54E-12	0.00E+00	0.00E+00	0.00E+00	1.22E-09	1.78E-03	0.00	campus
547880 4179680	547880	4179680	3.12E-04	1.20E-10	0.00E+00	4.08E-08	1.78E-08	2.18E-10	8.15E-07	3.05E-09	1.22E-11	0.00E+00	0.00E+00	0.00E+00	1.74E-09	1.69E-03	0.00	campus
547840 4179700	547840	4179700	2.82E-04	1.00E-10	0.00E+00	3.41E-08	1.49E-08	1.82E-10	6.82E-07	2.55E-09	1.02E-11	0.00E+00	0.00E+00	0.00E+00	1.46E-09	1.71E-03	0.00	campus
547980 4179740	547980	4179740	1.69E-04	6.16E-11	0.00E+00	2.10E-08	9.19E-09	1.12E-10	4.20E-07	1.57E-09	6.27E-12	0.00E+00	0.00E+00	0.00E+00	8.96E-10	1.81E-03	0.00	pot. res.
547980 4179660	547980	4179660	2.33E-04	7.76E-11	0.00E+00	2.64E-08	1.16E-08	1.41E-10	5.28E-07	1.97E-09	7.90E-12	0.00E+00	0.00E+00	0.00E+00	1.13E-09	1.74E-03	0.00	pot. res.
548020 4179640	548020	4179640	2.24E-04	7.30E-11	0.00E+00	2.49E-08	1.09E-08	1.33E-10	4.97E-07	1.86E-09	7.44E-12	0.00E+00	0.00E+00	0.00E+00	1.06E-09	1.73E-03	0.00	pot. res.

Appendix BIO
Biological Resources Appendix

TABLE BIO-1
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR ON THE CAMPUS SITE

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Campus Site
Invertebrates			
Western bumble bee (*Bombus occidentalis*)	--/CaT	Found in any area with sufficient flowers for nutrition, and underground burrows for nest for the queen.	**Moderate.** Suitable foraging habitat is present on Mt. Sutro.
San Bruno elfin butterfly (*Callophrys mossii bayensis*)	FE/--	Coastal, mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain, San Mateo County. Colonies are located on steep, north-facing slopes within the fog belt. Larval host plant is *Sedum spathulifolium*.	**Low.** Host plant not present within campus site.
Monarch butterfly (*Danaus plexippus plexippus)*	--/-- overwintering sites protected	Monarch butterfly breeding and larval habitat is on milkweed plants in open fields and meadows. During winter colonies stay in eucalyptus, Monterey cypress and other trees in California and at high altitudes in Mexico.	**Moderate (overwintering).** Suitable overwintering habitat is present in eucalyptus trees of Mt. Sutro reserve. There are several records of this species wintering in eucalyptus groves in San Francisco including Golden Gate Park, the Presidio, Fort Mason, and Telegraph Hill.
Bay checkerspot butterfly (*Euphydryas editha bayensis*)	FT/--	Found on shallow, serpentine-derived soil. The primary larvae host plant is dwarf plantain (*Plantago erecta*). When this plant dries, purple owl's clover (*Castilleja densiflora* or *C. exserta*) is the secondary host plant.	**Low.** Host plant not present within campus site.
Mission blue butterfly (*Icaricia icarioides missionensis*)	FE/--	Host plants are silver lupine (*Lupinus albifrons*), summer lupine (*Lupinus formosus*), and varicolor lupine *(Lupinus variicolor*). Historical distribution encompassed coastal scrub/grassland habitat of the northern San Francisco Peninsula and Marin County. Remaining populations found in only a few locations: Marin Headlands, Skyline ridges, San Bruno Mountain, and at Twin Peaks.	**Low.** Host plant not present within campus site.
Callippe silverspot butterfly (*Speyeria callippe callippe*)	FE/--	Hostplant is *Viola pedunculata*. Most adults found on East-facing slopes; males congregate on hilltops in search of females.	**Low.** Host plant not present within campus site.
Amphibians			
California giant salamander (*Dicamptodon ensatus*)	--/SSC	Vernal or temporary pools in annual grasslands, or open stages of woodlands. Typically adults use mammal burrows.	**Not Present.** Suitable aquatic habitat is not present on the campus site.
California red-legged frog (*Rana draytonii*)	FT/SSC	Streams, freshwater pools, and ponds with overhanging vegetation. Also found in woods adjacent to streams. Requires permanent or ephemeral water sources such as reservoirs and slow moving streams and needs pools of >0.5 m depth for breeding.	**Not Present.** Suitable aquatic habitat is not present ion the campus site.
Foothill yellow-legged frog (*Rana boylii*)	--/CaE	Partly-shaded, shallow streams & riffles with a rocky substrate in a variety of habitats; requires at least some cobble-sized substrate for egg-laying.	**Not Present.** Suitable aquatic habitat is not present on the campus site.
Reptiles			
Western pond turtle (*Actinemys marmorata*)	--/SSC	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation <6,000' in elevation. Require basking sites and upland habitat for egg laying (sandy banks and open, grassy fields)	**Not Present.** Suitable aquatic habitat is not present on the campus site.

TABLE BIO-1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR ON THE CAMPUS SITE

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Campus Site
Birds			
Short-eared owl (*Asio flammeus*)	--/SSC	Found in swamp lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	**Low.** Suitable marsh or meadow habitat is not present on the campus site.
Burrowing owl (*Athene cunicularia*)	--/SSC	Nests and forages in low-growing grasslands with burrowing mammals.	**Not Present.** Suitable open habitat is not present on the campus site.
Western snowy plover (*Charadrius alexandrines nivosus*)	FT/SSC	Sandy beaches, salt pond levees & shores of large alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**Not Present.** Shoreline habitat is not present on the campus site.
Northern harrier (*Circus hudsonius*)	--/SSC	Nests on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	**Not Present.** Suitable marsh habitat is not present on the campus site.
Yellow rail (*Coturnicops noveboracensis*)	--/SSC	Nests in shallow marshes and wet meadows in north-central North American; winters near coast in drier marshes, deep grass and rice fields.	**Low.** Suitable open habitat is not present on the campus site.
White-tailed kite (*Elanus leucurus*)	--/CFP	Nests in shrubs and trees adjacent to grasslands, forages over grasslands and agricultural lands	**Low.** Suitable open habitat not present on the campus site.
American peregrine falcon (*Falco peregrinus anatum*)	BCC/CFP	Nest consists of a scrape or a depression on rock, cliff or building ledge over an open site. Catches prey in flight, including small birds, bats or mammals.	**Moderate.** May nest on tall buildings and forage in surrounding area.
California black rail (*Laterallus jamaicensis*)	BCC/ST/CFP	Found in salt, brackish and freshwater marsh with dense vegetation for nesting habitat.	**Not Present.** Suitable marsh habitat is not present on the campus site.
Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*)	BCC/SSC	Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	**Not Present.** Suitable marsh habitat is not present on the campus site.
Alameda song sparrow (*Melospiza melodia pusillula*)	BCC/SSC	Salt marshes. Inhabits *Sarcocornia* marshes; nests low in *Grindelia* bushes (high enough to escape high tides) and in *Sarcocornia*.	**Not Present.** Suitable marsh habitat is not present ion the campus site.
San Pablo song sparrow (*Melospiza melodia samuelis*)	BCC/SSC	Inhabits tidal sloughs in the *Salicornia* marshes; nests in *Grindelia* bordering slough channels.	**Not Present.** Suitable marsh habitat is not present on the campus site.
Bank swallow (*Riparia riparia*)	--/FT	Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting holes.	**Low.** Suitable nesting habitat not found on the campus site, but may fly over.
Ridgway's rail [California clapper rail] (*Rallus obsoletus*)	FE/SE/CFP	Found in salt and brackish marsh with well-defined tidal channels and dense growth of pickleweed; feeds on invertebrates in mud-bottomed sloughs.	**Not Present.** Suitable marsh habitat is not present on the campus site.
California least tern (*Sternula antillarum browni*)	FE/SE/CFP	Breeds on shores of San Francisco Bay; nests are situated on barren to sparsely vegetated places near water, normally on sandy or gravelly substrates or abandoned salt flats.	**Not Present.** Suitable sandy or gravelly habitat is not present on the campus site.
Yellow-headed blackbird (*Xanthocephalus xanthocephalus*)	--/SSC	Nests in cattail marshes with nests attached to marsh vegetation. Colonial nesters, often sharing their habitat closely with red-winged blackbird (*Agelaius phoeniceus*).	**Not Present.** Suitable marsh habitat is not present on the campus site.

TABLE BIO-1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR ON THE CAMPUS SITE

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Campus Site
Birds (cont.)			
Northern spotted owl (*Strix occidentalis caurina*)	FT/ST	In California, the northern spotted owl inhabits a mix of old and younger forests, featuring dense canopy closure of mature trees, abundant logs, standing snags, and live trees with broken tops.	**Not Present.** Campus site is outside this species' known range.
Mammals			
Pallid bat (*Antrozous pallidus*)	--/SSC	Grasslands, shrublands, woodlands, and forests at lower elevations Common in arid regions with rocky outcroppings, particularly near water. Roosts in rock crevices, buildings, and under bridges. Very sensitive to disturbance.	**Low**. Suitable roosting habitat present in disused buildings on Mt. Sutro. This species was not detected during 2009 surveys in San Francisco parks (Krauel, 2009). Not expected to breed but may be present on a transient basis.
Hoary bat (*Lasiurus cinereus*)	--/--/WBWG Medium	Prefers open habitats or habitat mosaics, with access to trees for cover & open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	**Moderate**. Suitable roosting habitat present in large trees of Mt. Sutro Open Space Reserve, and has been recorded within 1 mile (CDFW, 2019). Not expected to breed but may be present on a transient basis.
Western red bat (*Lasiurus blossevillii*)	WBWG High	Roosts primarily in trees, 2-40 ft above ground, from sea level up through mixed conifer forests. Prefers habitat edges & mosaics with trees that are protected from above & open below with open areas for foraging.	**Moderate**. Suitable roosting habitat present in trees of Mt. Sutro Open Space Reserve. Known to roost in trees of Golden Gate Park (Krauel, 2009).
Townsend's big-eared bat (*Corynorhinus townsendii*)	--/SSC	Roosts in caves and cave-like habitats, with colonies occurring in areas dominated by exposed, cavity forming rock and/or historic mining districts. They prefer open roosting areas, not cracks or crevices, in forests, chaparral, grassland, desert or scrub areas.	**Low.** Suitable roosting habitat is present on walls and ceilings of disused buildings, but species is sensitive to human disturbance. Recorded in Twin Peaks in 2005.
Big free-tailed bat (*Nyctinomops macrotis*)	--/SSC	Roosts in buildings, caves, and occasionally in holes in trees, also in crevices in high cliffs or rock outcrops. Resident in southwestern U.S., occasional records in the region.	**Low.** Species is not resident in northern California.
San Pablo vole (*Microtus californicus sanpabloensis*)	--/SSC	Constructs burrow in soft soil. Feeds on grasses, sedges and herbs. Forms a network of runways leading from the burrow	**Not Present.** Campus site is not within species' range.
Salt marsh harvest mouse (*Reithrodontomys raviventris*)	FE/SE/CFP	Pickleweed is primary habitat, but may occur in other marsh vegetation types and in adjacent upland areas. Does not burrow, builds loosely organized nests. Requires higher areas for flood escape.	**Not Present**. Suitable habitat is not present on the campus site.
Salt-marsh wandering shrew (*Sorex vagrans halicoetes*)	--/SSC	Medium high marsh 6-8 ft above sea level where abundant driftwood is scattered among pickleweed.	**Not Present**. Suitable habitat is not present on the campus site.
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	--/SSC	Forest habitats of moderate canopy and moderate to dense understory. Constructs nests of shredded grass, leaves, and other material. May be limited by availability of nest-building materials	**Low.** Species is unlikely to nest along margins of Open Space near the campus site.
American badger (*Taxidea taxus*)	--/SSC	Herbaceous, shrub, and open stages of most habitats with dry, friable soils.	**Low.** Suitable open habitat not found on the campus site.

TABLE BIO-1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR ON THE CAMPUS SITE

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Campus Site
Plants			
Franciscan onion (*Allium peninsulare* var. *franciscanum*)	--/--/1B.2	Cismontane woodland, valley and foothill grassland, on clay, volcanic, often serpentinite soils. May – June. 52 – 305 m.	**Low.** Suitable soils not found on the campus site.
Napa false indigo (*Amorpha californica var. napensis*)	--/--/1B.2	Observations recorded in Monterey County and San Francisco Bay Area. Broadleafed upland forest, chaparral, or cismontane woodland. Perennial deciduous shrub. April - July. 30 – 735m	**Low.** May occur in Open Space on Mt. Sutro.
Bent-flowered fiddleneck (*Amsinckia lunaris*)	--/--/1B.2	Observed in cismontane woodland, valley and foothill grassland, or coastal bluff scrub. March - June. 3 – 500m	**Low.** Campus site is outside species' known distribution.
Franciscan manzanita (*Arctostaphylos franciscana*)	FE/--/1B.1	Serpentine outcrops in chaparral. February - April. 30 – 215m	**Low.** Campus site is outside species' known distribution.
Mt. Tamalpais manzanita (*Arctostaphylos montana* ssp. *montana*)	--/--/1B.3	Observations recorded in Marin and Humboldt County. Chaparral, valley and foothill grassland. Perennial evergreen shrub. February - April. 150 – 680m	**Not Present.** Campus site is outside of species' known distribution.
Presidio manzanita (*Arctostaphylos montana* ssp. *ravenii*)	FE/SE/1B.1	Chaparral, coastal prairie, and coastal scrub in open and rocky serpentine slopes. February - March. 45 – 215 m	**Not Present.** Campus site is outside of species' known distribution.
Marin manzanita (*Arctostaphylos virgata*)	--/--/1B.2	Chaparral, mixed evergreen forest, redwood forest, closed-cone pine forest in Marin County on sandstone or granite. Perennial evergreen shrub. Endemic to CA. January - March. 1-800 m	**Not Present.** Campus site is outside of species' known distribution.
Marsh sandwort (*Arenaria paludicola*)	FE/SE/1B.1	Freshwater or brackish marsh, wetlands and riparian areas. May to August. 3 – 170 m.	**Not Present.** Suitable habitat not present on campus site.
Alkali-milk vetch (*Astragalus tener* var. *tener*)	--/--/1B.2	Alkali playa and flats, valley, annual, and foothill grassland, vernal pools, low ground, and flooded lands. March – June. 1-170 m	**Not Present.** Suitable habitat not present on campus site.
Thurber's reed grass (*Calamagrostis crassiglumis*)	--/--/2B.1	Freshwater wetlands, wetland-riparian. Perennial rhizomatous herb May - August. 10-60 m	**Not Present.** Suitable habitat not present on campus site.
Tiburon mariposa –lily (*Calochortus tiburonensis*)	--/--/1B.1	Valley and foothill grassland on open, rocky, slopes in serpentine grassland. March – June. 50-150 m	**Not Present.** Endemic to Ring Mtn. Preserve on the Tiburon Peninsula.
Bristly sedge (*Carex comosa*)	--/--/2B.1	Lake margins, freshwater wetlands, edges of water. May-September -5-1620 m	**Not Present.** Local occurrence is historical. Suitable habitat not present on campus site.
Northern meadow sedge (*Carex praticola*)	--/--/2B.2	Moist to wet meadows and seeps. Perennial herb. May – July. 0-3200 m	**Not Present.** Local occurrence is historical. Suitable habitat not present on campus site.

TABLE BIO-1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR ON THE CAMPUS SITE

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Campus Site
Plants (cont.)			
Tiburon paintbrush (*Castilleja affinis* var. *neglecta*)	FE/ST/1B.2	Open serpentine grassland slopes. Perennial herb (hemiparasitic). April – June. 60-400 m	**Not Present.** Suitable habitat not present on campus site.
Pappose tarplant (*Centromadia parryi* ssp. *parryi*)	--/--/1B.2	Chaparral, coastal prairie, meadows and seeps, marshes and swamps (salt), valley and foothill grassland (mesic), often alkaline. May – November. 0 - 420 m.	**Not Present.** Suitable habitat not present on campus site.
Point Reyes bird's-beak (*Chloropyron maritimum* ssp. *palustre*)	--/--/1B.2	Recorded from San Luis Obispo County north to Humboldt County. Coastal salt marsh, wetland-riparian. Annual herb (hemiparasitic). June – October. 0 – 10 m.	**Not Present.** Suitable habitat not present on campus site.
San Francisco Bay spineflower (*Chorizanthe cuspidata* var. *cuspidata*)	--/--/1B.2	Observed as far south as Monterey County, but most recordings are in the San Francisco Bay Area. Coastal Strand, Coastal Prairie, Northern Coastal Scrub. Annual herb.	**Not Present.** Suitable habitat not present on campus site.
San Francisco Bay spineflower (*Chorizanthe robusta* var. *robusta*)	FE/--/1B.1	Dune, openings in coastal strands, maritime coastal scrub, valley and foothill grassland, in sandy or gravelly areas. Annual herb. April to September. 3 – 300 m.	**Not Present.** Suitable habitat is not present on campus site.
Franciscan thistle (*Cirsium andrewsii*)	--/--/1B.2	Found in mesic, sometimes serpentinite. Broadleafed upland forest, coastal bluff scrub, coastal prairie, and coastal scrub in mesic areas, sometimes serpentinite. Perennial herb. March – July. 0 – 150 m.	**Not Present.** Suitable habitat is not present on campus site.
Mt. Tamalpais thistle (*Cirsium hydrophilum* var. *vaseyi*)	--/--/1B.2	Observations recorded in San Francisco and Marin County in mixed evergreen forest, chaparral, wetland-riparian seeps, sometimes serpentinite. Perennial herb. May – August. 240 – 620 m.	**Low.** May occur in Open Space on Mt. Sutro.
Compact cobwebby thistle (*Cirsium occidentale* var. *compactum*)	--/--/1B.2	Coastal strand, coastal prairie, chaparral, northern coastal scrub. Perennial herb. April – June. 5 – 150 m.	**Low.** Suitable habitat is minimal in the vicinity of the campus site.
Presidio clarkia (*Clarkia franciscana*)	FE/SE/1B.1	Serpentine outcrops in grassland or scrub. May – June. 20-305 m.	**Not Present.** Suitable habitat is not present on campus site.
Round-headed Chinese houses (*Collinsia corymbosa*)	--/--/1B.2	Coastal strand, dunes. Annual herb. April – June. 0 -20 m.	**Not Present.** Suitable habitat is not present on campus site.
San Francisco collinsia (*Collinsia multicolor*)	--/--/1B.2	Northern coastal scrub, closed-cone pine forest, sometimes serpentinite. March – May. 30 -250 m.	**Low.** Local records are historical (early 1900s); suitable habitat is limited on campus site.
Western leatherwood (*Dirca occidentalis*)	--/--/1B.2	Broadleafed upland forest, chaparral, closed-cone coniferous forest, cismontane woodland, north coast coniferous forest, riparian forest, riparian woodland. On brushy slopes, mesic sites; mostly in mixed evergreen & foothill woodland communities. 25-425 m.	**Low.** May occur in Open Space on Mt. Sutro.
Tiburon buckwheat *(Eriogonum luteolum* var. *caninum*)	--/--/1B.2	Observations recorded in the San Francisco Bay Area up to Mendocino County. Coastal prairie, chaparral, and valley grassland. Annual herb. May-September. 0-700m	**Not Present.** Suitable habitat is not present on campus site.

TABLE BIO-1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR ON THE CAMPUS SITE

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Campus Site
Plants (cont.)			
Minute pocket moss (*Fissidens pauperculus*)	--/--/1B.2	Observations recorded along the west coast of California from Santa Cruz County to Del Norte, and east to Butte County. Moss grows on damp soil along the coast and dry streambeds/ streambanks in coniferous forests. 10 -1024 m.	**Not Present.** Suitable habitat is not present on campus site.
Marin checker lily (*Fritillaria lanceolata var. tristulis*)	--/--/1B.2	Perennial bulbiferous herb. Observations recorded in San Mateo and Marin County in canyons to riparian areas in northern coastal scrub, evergreen woodlands, and serpentine rock outcrops. February – May. 15-150m	**Low.** May occur in Open Space on Mt. Sutro. Local records from Twin Peaks in 2016.
Fragrant fritillary *Fritillaria liliacea*	--/--/1B.2	Coastal scrub, valley and foothill grassland, coastal prairie. Often on serpentine; usually on clay soils, in grassland. February- April. 3-410 m.	**Not Present.** Suitable habitat is not present on campus site.
Blue coast gilia (*Gilia capitata ssp. chamissonis*)	--/--/1B.1	Coastal dunes, coastal scrub. Annual herb, blooms. April – July. 2 – 200 m.	**Low.** Local occurrences are historical and suitable habitat is not present on campus site.
Diablo helianthella (*Helianthella castanea*)	--/--/1B.2	South Bay, East Bay, and North Bay in chaparral, foothill woodland, northern coastal scrub, riparian woodland and valley grassland, usually in rocky soils in partial shade. Perennial herb. Blooms March – June. 60 -1300 m.	**Not Present.** Suitable habitat is not present on campus site.
Congested-headed hayfield tarplant (*Hemizonia congesta* ssp. *congesta*)	--/--/1B.2	Recorded observations have been made as far south as Los Angeles County, but primarily found in the Bay Area, and along the west coast of California up to Del Norte. Also in El Dorado County. Grassy valleys and hills, often in fallow fields; sometimes along roadsides. April – November. 20-560 m.	**Low**. Suitable habitat on campus site area is limited.
Marin western flax (*Hesperolinon congestum*)	FT/ST/1B.1	Alameda, San Mateo, San Francisco, and Marin County with an additional observation recorded in Colusa County in chaparral and valley grassland. Annual herb. 60-370 m.	**Not Present.** Suitable habitat is not present on campus site.
Santa Cruz tarplant (*Holocarpha macradenia*)	FT/SE/1B.1	Monterey and Santa Cruz County, as well as the North Bay and East Bay in coastal prairie and valley grassland. Annual herb. June – October. 10-220 m.	**Not Present.** Suitable habitat is not present on campus site.
Thin-lobed horkelia (*Horkelia tenuiloba*)	--/--/1B.2	San Luis Obispo north to Mendocino County and east to Colusa County in chaparral, valley and foothill grassland, and sandy, mesic openings in upland forest. Perennial herb. 50 – 500 m.	**Not Present.** Suitable habitat is not present on campus site.
Small groundcone (*Kopsiopsis hookeri*)	--/--/2B.3	Recorded in counties along the west coast of California including; Santa Cruz, Marin, and Lake County to Del Norte County in redwood forest. Found in open woods, generally on *Gaultheria shallon.* Perennial rhizomatous herb (parasitic). April – August. 120-1435m	**Low**. Scattered redwood trees present on campus site, but species has not been observed in San Francisco.
San Francisco lessingia (*Lessingia germanorum*)	FE/SE/1B.1	Northern coastal scrub, dunes. Annual herb. July – November. 25 – 110 m.	**Not Present.** Suitable habitat is not present on campus site.

TABLE BIO-1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR ON THE CAMPUS SITE

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Campus Site
Plants (cont.)			
Tamalpais lessingia (*Lessingia micradenia var. micradenia*)	--/--/1B.2	Marin and Lake County and chaparral and valley grassland. Usually on serpentine, in serpentine grassland or serpentine chaparral. Often on roadsides. Annual herb. June – October. 60-305 m	**Not Present.** Suitable habitat is not present on campus site.
Marsh microseris (*Microseris paludosa*)	--/--/1B.2	Found along the west coast from San Luis Obispo County to Mendocino County. Occurs in northern coastal scrub and closed-cone pine forest. Perennial herb. April – June. 5-300m	**Low.** Local occurrences are historical and habitat is limited on campus site.
White-rayed pentachaeta (*Pentachaeta bellidiflora*)	FE/SE/1B.1	Annual herb. Along the west coast from Monterey County to Marin County – none recorded in SF County, in valley grassland. March – May. 35-610m.	**Not Present.** Campus site is outside of species' range.
Choris' popcorn-flower (*Plagiobothrys chorisianus* var. *chorisianus*)	--/--/1B.2	Mesic sites in chaparral, coastal scrub, coastal prairie. 15-100 m.	**Not Present.** Suitable chaparral, scrub and coastal prairie habitat is not present on campus site.
Hairless popcornflower (*Plagiobothrys glaber*)	--/--/1A	South and East Bay, and Marin County in coastal salt marsh, wetland-riparian meadows, salt-marsh, coastal. Occurs almost always under natural conditions in wetlands. Annual herb. March – May. 5-125m.	**Not Present.** Presumed extinct in California.
North Coast semaphore grass (*Pleuropogon hooverianus*)	--/ST/1B.1	North Bay to Mendocino County. Farthest north in Del Norte County in mixed evergreen forest, north coastal coniferous forest, freshwater wetlands, wetland-riparian in meadows and vernal-pools. Usually occurs in wetlands, but occasionally found in non-wetlands. Perennial rhizomatous grass. April-June. 10 -671 m.	**Not Present.** Campus siteis outside of species' range.
Oregon polemonium (*Polemonium carneum*)	--/--/2B.2	Coastal prairie and scrub in lower montane coniferous forest. April – September. 0-1830m	**Not Present.** Suitable habitat is not present on campus site.
Adobe sanicle (*Sanicula maritima*)	--/--/1B.1	Occurs in chaparral, coastal prairie, meadows and seeps, and grassland in clay, serpentinite. Perennial herb. February – May. 30-240m.	**Not Present.** Local occurrences are historical and suitable habitat is not present on campus site.
Marin checkerbloom (*Sidalcea hickmanii* ssp.*virdis*)	--/--/1B.2	Serpentine soils in chaparral habitats. May – June. 50-430m.	**Not Present.** Suitable habitat is not present on campus site.
San Francisco campion (*Silene verecunda* ssp. *verecunda*)	--/--/1B.2	Sandy habitats in coastal bluff scrub, chaparral, coastal prairie, coastal scrub, and grassland. February – August. 30-645m	**Not Present.** Suitable habitat is not present on campus site.
Santa Cruz microseris (*Stebbinsoseris decipiens*)	--/--/1B.2	Monterey, Santa Cruz, and Marin County Coastal Prairie, Chaparral, Mixed Evergreen Forest, Closed-cone Pine Forest, Northern Coastal Scrub. Weak affinity to serpentine soil. Annual herb. April – May. 10-500m	**Not Present.** Campus site likely outside of species' range.

TABLE BIO-1 (CONTINUED)
SPECIAL-STATUS SPECIES WITH POTENTIAL TO OCCUR ON THE CAMPUS SITE

Name	Listing Status	General Habitat Requirements	Potential for Species Occurrence Within the Campus Site
Plants (cont.)			
Mt. Tamalpais jewelflower (*Streptanthus batrachopus*)	--/--/1B.3	Only found in the North Bay regions from Marin County to Mendocino and east to Colusa County. Chaparral, closed-cone pine forest. Annual herb. April – July. 335-670 m.	**Not Present.** Campus site is outside of species' range.
Tiburon jewelflower (*Streptanthus glandulosus* ssp. *niger*)	FE/SE/1B.1	Shallow, rocky serpentine slopes in grassland. May-June. 30-150m.	**Not Present.** Suitable habitat is not present on campus site.
Two-fork clover (*Trifolium amoenum*)	FE/--/1B.1	South Bay (Santa Clara/San Mateo), East Bay and North Bay in valley grassland, wetland-riparian. Sometimes on serpentine soil, open sunny sites, swales. Most recently sighted on roadside and eroding cliff face. Annual herb. April-June. 5-415m.	**Not Present.** Suitable habitat is not present on campus site.
Saline clover (*Trifolium hydrophilum*)	--/--/1B.2	Mesic, alkaline sites. April-June. 1-335 m.	**Not Present.** Suitable habitat is not present on campus site.
San Francisco owl's-clover (*Triphysaria floribunda*)	--/--/1B.2	Usually serpentinite conditions in coastal prairie and scrub, and grassland. April-June. 10-160 m.	**Not Present.** Suitable habitat is not present on campus site.
Coastal triquetrella (*Triquetrella californica*)	--/--/1B.2	Grows within 30m of the coast in coastal scrub, grasslands and in open gravels on roadsides, hillsides, rocky slopes, and fields. On gravel or thin soil over outcrops. Moss. 10-100 m.	**Moderate.** Known occurrences in local area and limited suitable habitat present.

STATUS CODES:

USFWS (U.S. Fish and Wildlife Service)
FE = Listed as Endangered by the Federal Government
FT = Listed as Threatened by the Federal Government.
FC = Listed as Candidate
BCC = USFWS Bird of Conservation Concern

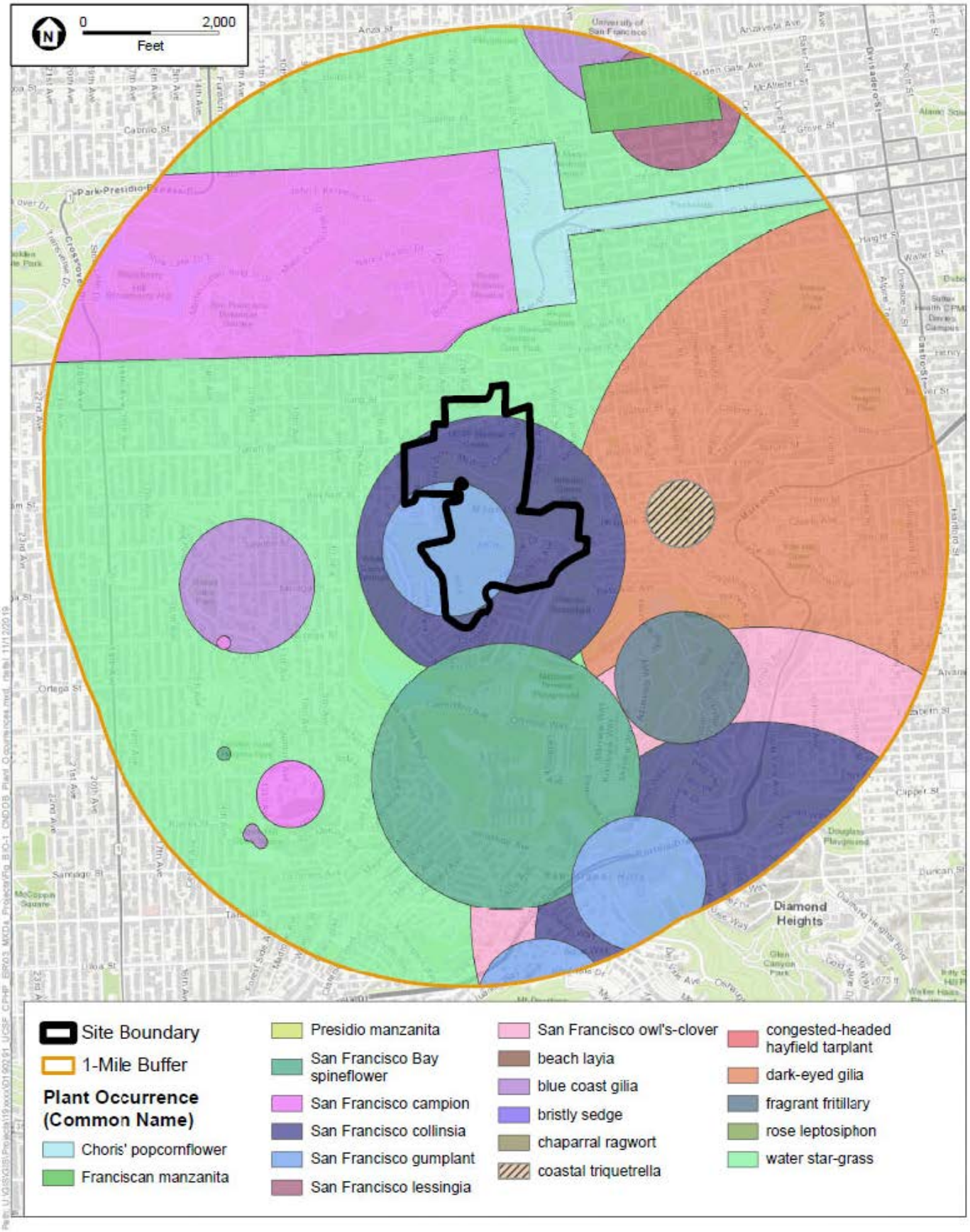
CDFW (California Department of Fish and Wildlife)
SE = Listed as Endangered by the State of California
ST = Listed as Threatened by the State of California
CaE = Candidate Endangered by the State of California
CaT = Candidate Threatened by the State of California
CFP = California Fully Protected species
SSC = Species of Special Concern
WBWG = Western Bat Working Group

California Rare Plant Rank
Rank 1A=Plants presumed extinct in California
Rank 1B=Plants rare, Threatened, or Endangered in California and elsewhere
Rank 2= Plants rare, Threatened, or Endangered in California but more common elsewhere
Rank 3= Plants about which more information is needed
Rank 4= Plants of limited distribution
An extension reflecting the level of threat to each species is appended to each rarity category as follows:
.1 – Seriously endangered in California
.2 – Fairly endangered in California
.3 – Not very endangered in California

POTENTIAL TO OCCUR CATEGORIES:

Not Present = The campus site and/or immediate vicinity does not support suitable habitat for a particular species. Campus site may be outside of the species' known range.
Low Potential = The campus site and/or immediate vicinity only provides limited habitat. The species' known range may be outside of the plan area.
Moderate Potential = The campus site and/or immediate vicinity provide suitable habitat.
High Potential = The campus site and/or immediate vicinity provides ideal habitat conditions or the species has been observed.

SOURCES: CDFW 2019; CNPS 2019; USFWS 2019

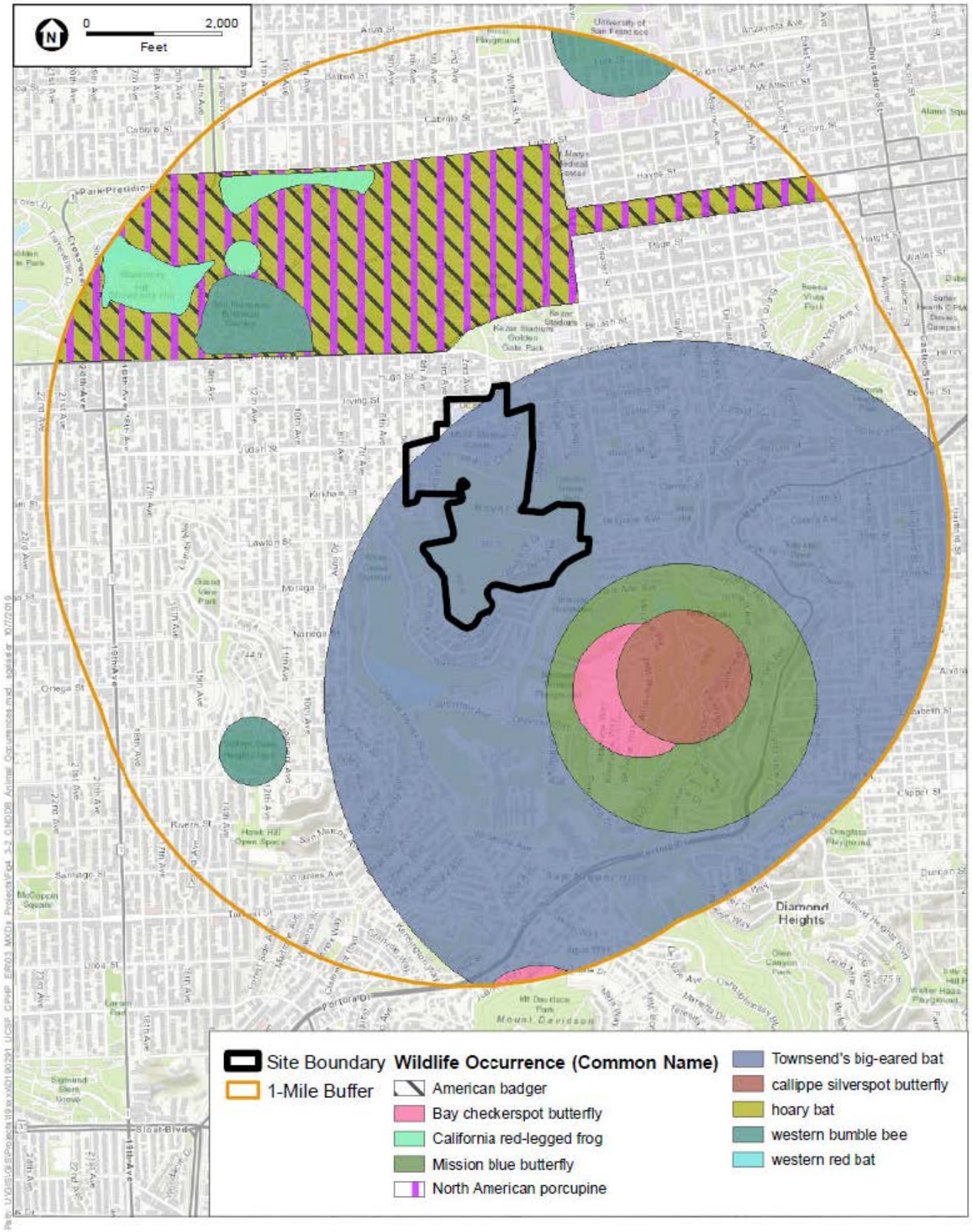


SOURCE: ESRI, CNDDB, 2019.

UCSF Comprehensive Parnassus Heights Plan EIR

Figure BIO-1
CNDDB Plant Occurrences

ESA



SOURCE: ESRI, CNDDB, 2019.

UCSF Comprehensive Parnassus Heights Plan EIR

Figure BIO-2
CNDDB Wildlife Occurences

ESA

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Appendix CUL
Cultural Resources Appendix

TABLE CUL-1
INVENTORY OF EXTANT BUILDINGS AND CULTURAL LANDSCAPES ON UCSF PARNASSUS HEIGHTS CAMPUS

Building Name	Year Built (Source)	Eligibility (Source)	Proposed Action Under 2014 LRDP	Proposed Action Under CPHP
Kalmanovitz Library	1991 (aerial photos)	Not evaluated		
Millberry Union	1955 (Carey & Co., 2011)	NR[a] and CR[b] (Carey & Co., 2011)	Renovation	Demolition
Millberry Union Garage	1955 (aerial photos)	Not evaluated		Demolition
Medical Building 1 (Ambulatory Care Center or ACC)	1972 (Carey & Co., 2011)	Not eligible (Carey & Co., 2011)		Addition
Lucia Child Care Center	1978 (Carey & Co., 2011)	Not eligible (Carey & Co., 2011)		Demolition
UC Hall	1917 (Carey & Co., 2003)	CR (Carey & Co., 2003)	Seismic retrofit and renovation	Demolition
Dental Clinics	1979 (Carey & Co., 2011)	NR and CR with Criteria Consideration G (Carey & Co., 2011)		Demolition
Koret Vision Research	1986 (Carey & Co., 2011)	Not evaluated (Carey & Co. 2011)	Demolition	Demolition
Kirkham Child Care Center	2009 (Carey & Co., 2011)	Not evaluated (Carey & Co., 2011)		Demolition
Proctor	1956 (Carey & Co., 2003 and 2011)	Not eligible (Carey & Co., 2003)	Demolition	Demolition
Clinical Sciences	1933 (Page & Turnbull, 2005)	CR (Page & Turnbull, 2005)		
School of Nursing	1979 (Carey & Co., 2011), 1972 (UCSF, 2019)	Not eligible (Carey & Co., 2011)		Demolition
Dolby Regeneration Medicine	2010 (aerial photos)	Not evaluated		
Saunders Court (cultural landscape)	1967 (Carey & Co. 2011)	Presumed eligible for NR and CR (Carey & Co. 2011)	Renovation	Alteration/ expansion
Mount Sutro Open Space Reserve (cultural landscape)	1886 (Knapp & VerPlanck, 2013)	CR (Knapp & VerPlanck, 2013)	Continued management	
Health Sciences Instruction and Research (HSIR) West	1966 (Carey & Co. 2011), 1964 (UCSF, 2019)	Presumed eligible for NR and CR (Carey & Co. 2011)		Renovation
HSIR East	1966 (Carey & Co. 2011), 1964 (UCSF, 2019)	Presumed eligible for NR and CR (Carey & Co. 2011)		Renovation
Medical Sciences	1954 (Carey & Co. 2011)	NR and CR (Carey & Co., 2011)		Renovation
Moffitt Hospital	1955 (Carey & Co. 2003)	Not eligible (Carey & Co. 2003)	Renovation	Demolition (variant)
Long Hospital	1982 (Carey & Co. 2011)	Not eligible (Carey & Co., 2011)	Addition	
Langley Porter Psychiatric Institute (LPPI)	1943 (Graves, 2019a), 1941 (UCSF, 2019)	NR and CR (Graves, 2019a)	Demolition	Demolition
Pump House	Ca. 1990 (aerial photos)	Not evaluated		
LPPI Butler	1964 (Carey & Co. 2011)	Not eligible (Carey & Co. 2011)	Demolition	
LPPI Outpatient Clinic (OPC)	1979 (Carey & Co. 2011)	Not eligible (Carey & Co. 2011)	Demolition	

TABLE CUL-1 (CONTINUED)
INVENTORY OF EXTANT BUILDINGS AND CULTURAL LANDSCAPES ON UCSF PARNASSUS HEIGHTS CAMPUS

Building Name	Year Built (Source)	Eligibility (Source)	Proposed Action Under 2014 LRDP	Proposed Action Under CPHP
LPPI Paint Shop/Hut	1966 (Carey & Co., 2011)	Not eligible (Carey & Co., 2011)	Demolition	
Central Utility Plant	1998 (aerial photos)	Not evaluated		
Parnassus Services	2005 (aerial photos)	Not evaluated		
Environmental Health and Safety (EHS)	1971 (Carey & Co., 2011)	Not eligible (Carey & Co., 2011)	Demolition	
Environmental Health and Safety Annex (Annex)	1953 (Carey & Co., 2011)	Not eligible (Carey & Co., 2011)		
Potential Third Avenue Historic District		NR and CR (Carey & Co., 2011)		
1320 Third Avenue	1911 (Carey & Co., 2011), 1912 (UCSF, 2019)	Contributor		
1322-24 Third Avenue	1911 (Carey & Co., 2011)	Non-contributor		
1326 Third Avenue	1911 (Carey & Co., 2011), 1912 (UCSF, 2019)	Contributor		
1332 Third Avenue	1911 (Carey & Co., 2011), 1915 (UCSF, 2019)	Contributor		
1338 Third Avenue	1910 (Carey & Co., 2011), 1913 (UCSF, 2019)	Contributor		
1344 Third Avenue	1910 (Carey & Co., 2011), 1912 (UCSF, 2019)	Contributor		
1350 Third Avenue	1911 (Carey & Co., 2011), 1912 (UCSF, 2019)	Contributor		
1356 Third Avenue	1911 (Carey & Co., 2011)	Contributor		
1362 Third Avenue	1909 (Carey & Co. 2011)	Contributor		
145 Irving Street Apartments	2006 (aerial photos)	Not evaluated		
1420 Fifth Avenue	1911 (Carey & Co., 2011)	Not eligible (Carey & Co., 2011)		
1422-24 Fifth Avenue	1922 (Carey & Co., 2011), 1915 (UCSF, 2019)	NR and CR (Carey & Co., 2011)		
1428 Fifth Avenue	1909 (Carey & Co., 2011), 1915 (UCSF, 2019)	Not eligible (Carey & Co., 2011)		
1432-34 Fifth Avenue	1910 (Carey & Co., 2011), 1911 (UCSF, 2019)	NR and CR (Carey & Co., 2011)		
1440 Fifth Avenue	1911 (UCSF, 2019)	Not evaluated		
1442 Fifth Avenue	1911 (Carey & Co., 2011)	Not eligible (Carey & Co., 2011)		
1452 Fifth Avenue	1909 (Carey & Co., 2011), 1920 (UCSF, 2019)	Not eligible (Carey & Co., 2011)		
1454 Fifth Avenue	1909 (Carey & Co., 2011), 1911 (UCSF, 2019)	Not eligible (Carey & Co., 2011)		
1460 Fifth Avenue	1912 (Carey & Co., 2011), 1911 (UCSF, 2019)	Not eligible (Carey & Co., 2011)		
1464 Fifth Avenue	1912 (Carey & Co., 2011), 1911 (UCSF, 2019)	Not eligible (Carey & Co., 2011)		
1468 Fifth Avenue	1948 (Carey & Co., 2011), 1920 (UCSF, 2019)	NR and CR (Carey & Co., 2011)		

TABLE CUL-1 (CONTINUED)
INVENTORY OF EXTANT BUILDINGS AND CULTURAL LANDSCAPES ON UCSF PARNASSUS HEIGHTS CAMPUS

Building Name	Year Built (Source)	Eligibility (Source)	Proposed Action Under 2014 LRDP	Proposed Action Under CPHP
1472-74 Fifth Avenue	1922 (Carey & Co., 2011)	Not eligible (Carey & Co., 2011)		
1478-80 Fifth Avenue	1924 (Carey & Co., 2011), 1923 (UCSF, 2019)	Not eligible (Carey & Co., 2011)		
1482 Fifth Avenue	1923 (Carey & Co., 2011), 1922 (UCSF, 2019)	Not eligible (Carey & Co., 2011)		
1486-88 Fifth Avenue	1924 (UCSF, 2019)	Not evaluated		
1490 Fifth Avenue	1909 (Carey & Co., 2011), 1905 (UCSF, 2019)	Not eligible (Carey & Co., 2011)		
50 Kirkham Street	1923 (Carey & Co., 2011)	Not eligible (Carey & Co., 2011)		
Faculty Alumni House (745 Parnassus Avenue)	1915 (Carey & Co., 2011)	NR and CR (Carey & Co., 2011)	Seismic retrofit	
Surge	1966 (Carey & Co., 2011)	Presumed eligible for NR and CR (Carey & Co., 2011)	Demolition	
Woods	1962 (Carey & Co., 2003)	Not eligible (Carey & Co., 2003)	Demolition	
University House (Chancellor's residence)	1966 (Carey & Co., 2011)	NR and CR (Carey & Co., 2011)		
Aldea San Miguel Housing Complex				
75 Behr Avenue	Ca. 1998-99 (UCSF, 2019)	Not evaluated		Demolition
80 Behr Avenue	Ca. 1998-99 (UCSF, 2019)	Not evaluated		Demolition
85 Behr Avenue	Ca. 1998-99 (UCSF, 2019)	Not evaluated		Demolition
90 Behr Avenue	Ca. 1998-99 (UCSF, 2019)	Not evaluated		Demolition
95 Behr Avenue	Ca. 1998-99 (UCSF, 2019)	Not evaluated		Demolition
Aldea San Miguel 8 (105 Behr Avenue)	1960 (Carey & Co., 2011)	NR and CR (Carey & Co., 2011)		Demolition
45 Johnstone Drive	Ca. 1998-99 (UCSF, 2019)	Not evaluated		Demolition
50 Johnstone Drive	Ca. 1998-99 (UCSF, 2019)	Not evaluated		Demolition
155 Johnstone Drive (Aldea Center on Mount Sutro)	2011 (UCSF, 2019)	Not evaluated		Demolition
Aldea San Miguel 12 (165 Johnstone Drive)	1960 (Carey & Co., 2011)	NR and CR (Carey & Co., 2011)		Demolition
Aldea San Miguel 10 (175 Johnstone Drive)	1960 (Carey & Co., 2011)	NR and CR (Carey & Co., 2011)		Demolition
20 Adolph Sutro Court	Ca. 1998-99 (UCSF, 2019)	Not evaluated		Demolition
30 Adolph Sutro Court	Ca. 1998-99 (UCSF, 2019)	Not evaluated		Demolition

NOTES:
[a] National Register of Historic Places
[b] California Register of Historical Resources

Appendix GHG
Greenhouse Gas Emissions Appendix

GHG Inventories

UCSF CPHP GHG Inventory

Year 2018 (Existing)

Mobile source from CalEEMod
(based on Adavant daily VMT of 298132 translated to annual VMT of 108818180)

	MT/Year		
CO2	**CH4**	**N2O**	**eCO2**
43,266.4325	2.3218	0.0000	43,324.4772

Electricity

From Spreadsheet: TCR 2018 Summary, State and Parn Utilities tab:

1. Parnasus Campus Demand (non-CUP)	739784.13	KWH	Total
	57001	KWH	from PG&E
	382981	KWH	from UCOP
All other sources zero emission			
Total non-zero sources =	439982	KWh	= 439.982 MWh

From Spreadsheet: TCR 2018 Summary, 2018 GHG Estimates tab: Use market-based EF's as more conservative (less emissions under existing scenario)

PG&E Emissions Factor (bundled) =	0.095	MT CO2/MWhr
UCOP Emission Factor =	0.095	MT CO2/MWhr

Parnasus Campus (non-CUP) CO2 Emissions = 41.79829 MT CO2

CH4 emission factor =	0.0000150
N2O Emission factor =	0.0000018

From Spreadsheet: TCR 2018 Summary, 2018 GHG Estimates tab:
From Spreadsheet: TCR 2018 Summary, 2018 GHG Estimates tab:

CH4 GWP =	28
N2O GWP =	265

Parnasus Campus (non-CUP) eCO2 Emissions =

MT/Year			
CO2	**CH4**	**N2O**	**eCO2**
41.80	0.01	0.00	42.19

2. CUP Power Demand = 1,869.00 MWh
CUP Emissions = 177.00 MT CO2 From Spreadsheet: TCR 2018 Summary, 2018 GHG Estimates tab (cell E61)

CUP eCO2 Emissions =

MT/Year			
CO2	**CH4**	**N2O**	**eCO2**
177.00	0.03	0.00	205.93

Total Electricity GHG =

MT/Year			
CO2	**CH4**	**N2O**	**eCO2**
218.80	0.03	0.00	248.12

Natural Gas from CUP
Based on UCSF Inventory for 2018

MT/Year				
CO2	**CH4**	**N2O**	**eCO2**	
79510.16	1.35	3.29	79,514.80	From Spreadsheet: TCR 2018 Summary, 2018 GHG Estimates tab:

Natural Gas non-CUP
Demand (2018) = 125,792.29 Therms From Spreadsheet: TCR 2018 Summary, State and Parn Utilities tab (cell B11)

CO2 Emission Factor =	5.31E-03	MT/Therm
CH4 Emission Facor =	9.00E-08	MT/Therm
N2O Emission Factor =	9.00E-08	MT/Therm

From Spreadsheet: TCR 2018 Summary, 2018 GHG Estimates tab:

MT/Year			
CO2	**CH4**	**N2O**	**eCO2**
667.96	0.01	0.01	671.27

Water and Wastewater from CalEEMod
(based on default demand for 3.9 million gsf of hospital use)

MT/Year			
CO2	**CH4**	**N2O**	**eCO2**
155.2558	15.9463	0.3765	666.1171

Solid Waste calculated in CalEEMod
(Based on Waste Generation Rate of 1,600 tpy cited in Utility Section Analysis for non-diverted waste to landfill)

MT/Year			
CO2	**CH4**	**N2O**	**eCO2**
324.7855	19.1943	0.0000	804.6424

Total Existing GHG = 125,229.43

UCSF CPHP GHG Inventory

Year 2050 (with CPHP)

Mobile source from CalEEMod
(based on Adavant daily VMT of 579024 translated to annual VMT of 211343760)

MT/Year

CO2	CH4	N2O	eCO2
54,991.4811	1.8726	0.0000	55,038.2970

Electricity
UCSF Net Zero electricity in 2050

MT/Year

CO2	CH4	N2O	eCO2
0.00	-	-	0.00

Natural Gas from CUP
Based on UCSF Inventory for 2018 and net increase in gsf
Increase in gsf = 61%

MT/Year

CO2	CH4	N2O	eCO2
128011.35	2.17	5.30	128018.82

Natural Gas from non-CUP
Based on UCSF Inventory for 2018 and net increase in gsf
Increase in gsf = 61%

MT/Year

CO2	CH4	N2O	eCO2
1075.41	0.02	0.02	1080.75

Water and Wastewater from CalEEMod
(based on default demand for 6.0 million gsf of hospital use)

MT/Year

CO2	CH4	N2O	eCO2
238.8551	24.5327	0.5793	1,024.7955

Solid Waste calculated in CalEEMod
(Based on Waste Generation Rate of 1,600 tpy cited in Utility Section Analysis for non-diverted waste to landfill)

MT/Year

CO2	CH4	N2O	eCO2
452.2639	26.7280	0.0000	1,120.4646

Construction (based on Initial Phase projects and hospital CalEEMod output)

CO2	CH4	N2O	eCO2
350.97	**0.01**	**0**	**351.25**

Total Campus-wide with CPHP GHG = 186,634.39

Increase with CPHP = 61,404.96

GHG Emissions - Construction

Construction - First Phase and new Hospital

	From CalEEMod	Year	CO2 (MT)
Aldea		2028	430.0915
		2029	1.783
Irving Street Arrival			
		2022	165.0553
		2023	142.818
RAB			
		2022	804.807
		2023	497.193
		2024	544.4323
		2025	537.4497
Hospital		2024	1,114.17
		2025	1,046.54
		2026	2,065.56
		2027	1,020.37
		2028	1,082.93
		2029	1,076.05
	Total		10529.25
	Amortized 30 years		350.9749

Appendix GHGRS
Greenhouse Gas Reduction Strategy Update

UCSF Climate Action Plan

& Greenhouse Gas Reduction Strategy



University of California, San Francisco

July 2020

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1 Background and Objectives

This document is an update of the 2014 *Long Range Development Plan* (LRDP) Greenhouse Gas Reduction Strategy Reduction Strategy and the subsequent 2017 UCSF Climate Action Plan & Greenhouse Gas Reduction Strategy. The 2014 document was prepared to ensure that the LRDP is implemented in alignment with the UC Sustainable Practices Policy[1]; in particular the policies on greenhouse gases (GHGs), to fulfill the GHG reduction requirements of the State of California (AB 32)[2], and, to allow for CEQA analysis of the necessary actions to meet University policy while implementing the projects outlined in the campus 2014 LRDP as amended.

UC San Francisco (UCSF) has prepared this update to reflect changes that have occurred since 2014 and 2017 in both the goals outlined in the UC Sustainable Practices Policy and, in the addition of new campus projects unforeseen at the time of LRDP adoption. The plan also updates the underlying quantitative analyses.

Relevant changes since 2014 include:

- As of June 2015, the UC Sustainable Practices Policy required each campus to develop strategies for meeting the following UC goals: 1. Climate neutrality from scope 1 and 2 sources by 2025, 2. Climate neutrality from specific scope 3 sources by 2050 or sooner.

- The University of California began directly supplying electricity under a wholesale power program as part of the initiative to achieve carbon neutrality by 2025. Specifically making Clean Carbon free electricity (0 lbs/CO_2/MWh) available to its individual campuses in 2019.[3]

- Voluntary purchase of carbon offsets at UCSF beginning in 2018. Revisions to policy on the purchase of carbon offsets to mitigate GHG emissions starting in 2020.[4]

- Five amendments to the 2014 LRDP to accommodate campus projects unforeseen or not fully developed at the time of 2014 LRDP:

    - LRDP Amendment 1 – 2016. Accommodating the development of a 28,000 gsf child care facility accommodating 272 children at Mission Bay Block 18.[5]

[1] UC Office of the President (UCOP). http://policy.ucop.edu/doc/3100155/Sustainable%20Practices

[2] State of California. www.leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf

[3] https://www.universityofcalifornia.edu/press-room/university-california-supply-electricity-select-campuses-medical-centers

[4] https://ucop.edu/carbon-neutrality-initiative/_files/overcoming-barriers-to-carbon-neutrality.pdf

[5] https://campusplanning.ucsf.edu/sites/campusplanning.ucsf.edu/files/reports/2014%20Long%20Range%20Development%20Plan%20Amendment%20%231%20-%20Revised%20Mission%20Bay%20Functional%20Zone%20Map_0.pdf

  - LRDP Amendment 2 – 2017. Detailing the programming for the 343,000 gsf research/office building on Mission Bay block 33.[6]

  - LRDP Amendment 3 - 2017. Construction of a 150,000 gross square feet psychiatry building at 2130 Third Street to replace the LPPI facility located on Parnassus Heights.[7]

  - LRDP Amendment 4 - 2017. Allowing for construction of a 360,000 gsf 610-unit student housing complex on 2 acres of land on Minnesota Street south of Mission Bay.[8]

  - LRDP Amendment 5 – 2019. An acquisition of a 70 Unit housing building at 2130 Post adjacent to Mount Zion.[9]

- The development of the Comprehensive Parnassus Heights Plan (CPHP). A proposal that would provide for development of approximately 2.04 million gsf of net new building space with significant new clinical, research, and housing facilities at that campus site.

This *GHG Reduction Strategy*:

- Consolidates GHG reduction efforts already underway and planned by UCSF over the life of the LRDP (through 2035); and reflects the growth planned at Parnassus under the Comprehensive Parnassus Heights Plan (through 2050)

- Quantifies the impact on GHG emissions of projected land use as represented by the LRDP as amended

- Reflects and reinforces the policy direction regarding GHG reduction provided by the regular ongoing public meetings with the UCSF campus community and the annual reporting to the UC Regents

- Creates a framework for the ongoing monitoring and revision of this Greenhouse Gas Reduction Strategy; and

- Helps streamline California Environmental Quality Act (CEQA) review of future campus development projects as consistent with the LRDP growth projections and the GHG reduction policies and programs contained in the GHG Reduction Strategy.

This *GHG Reduction Strategy* has been prepared in accordance with CEQA Guidelines Section §15183.5, which specifically addresses how lead agencies can analyze and mitigate GHGs at a programmatic level and streamline environmental review of future projects that are consistent with the policies and programs

[6] https://regents.universityofcalifornia.edu/regmeet/jan17/f5.pdf
[7] https://regents.universityofcalifornia.edu/regmeet/may17/f3.pdf
[8] https://regents.universityofcalifornia.edu/regmeet/may17/f5.pdf
[9] https://campusplanning.ucsf.edu/sites/campusplanning.ucsf.edu/files/reports/Action%20Item-Post%20Street%20Faculty%20Housing-%20Approved%20budg%2Bfin%2Bdes%2BCEQA%2BLRDPAmend.pdf

contained in this *GHG Reduction Strategy*. Development of this strategy was also informed by the Governor's Office of Policy and Research (OPR) *CEQA Guidelines*[10] and its technical advisory on CEQA and Climate Change,[11] and by the Bay Area Air Quality Management District (BAAQMD*) California Environmental Quality Act Air Quality Guidelines*.

For UCSF, with land use authority over a significant urban area, adoption of campus-wide plan policies and programs for reducing GHG emissions is an effective way to reduce the cumulative impact of UCSF operations on climate change, and to streamline later project-specific CEQA reviews. The *GHG Reduction Strategy* is intended to minimize the effects of GHGs at a programmatic level across the UCSF Mount Zion and Mission Bay campus sites through the year 2035 and the Parnassus Heights campus site through 2050. It is designed to be a "qualified" strategy under the streamlining provisions of CEQA Guidelines §15183.5, to provide CEQA coverage of GHG emissions for future development projects that are consistent with LRDP growth projections and the policies and strategies that are contained in the *GHG Reduction Strategy*. As future individual projects are proposed, project-specific environmental review documents can tier from or incorporate by reference the programmatic environmental review of the LRDP and *GHG Reduction Strategy*, to determine if the project's GHG impact is cumulatively considerable. Future environmental documents that rely on the *GHG Reduction Strategy* for cumulative impact analysis of GHGs must identify the requirements specified in the *GHG Reduction Strategy* that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project. The procedure for determining if a future project is consistent with the LRDP and *GHG Reduction Strategy* is presented in Section 7.0: CEQA Project Review.

The essential requirements of a qualified *GHG Reduction Strategy*, under CEQA Guidelines §15183.5 and as interpreted by OPR and BAAQMD are as follows:

- Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area, using accepted accounting protocols
- Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the strategy would not be cumulatively considerable
- Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographical area
- Specify GHG reduction measures and performance standards, that, substantial evidence demonstrates, if implemented on a project-by-project basis, will collectively achieve the specified emissions target
- Establish a mechanism by which to monitor the plan's progress toward achieving its targets and one which will trigger required amendment if the plan is not achieving specified levels; and
- Be adopted in a public process following environmental review

UCSF's existing *Climate Action Plan*, dated December 2009, established a 1990 baseline, which in turn informs a 2020 campus-wide target (consistent with AB 32 and the *UC Sustainable Practices Policy*), It

[10] Governor's Office of Policy and Research (OPR), *CEQA Guidelines*, 2014. http://opr.ca.gov/s_ceqaguidelines.php
[11] OPR, *CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review*, 2008. http://opr.ca.gov/docs/june08-ceqa.pdf

forecast emissions through 2020, and included a comprehensive set of prescriptive GHG reduction measures. The *2009 Climate Action Plan* did not undergo CEQA review and it was not adopted in a public process; in addition, it does not include a clear monitoring plan for tracking GHG emissions reductions and adjusting the plan over time to meet the 2020 target.

When the LRDP was adopted in 2014, qualified GHG reduction strategies were constructed around target year 2020, since that is the AB 32 planning horizon. In 2016, the Legislature passed SB 32, which codifies a 2030 GHG emissions reduction target of 40 percent below 1990 levels. In 2018, Governor Brown signed executive order B-55-18 establishing a statewide goal to achieve carbon neutrality as soon as possible, and no later than 2045. The UC Sustainable Practices Policy require each campus to develop strategies for meeting climate neutrality for scope 1 and 2 sources by 2025, and scope 3 by 2050. This *GHG Reduction Strategy* provides a framework for meeting the goals and maintaining qualification going forward.[12]

With respect to environmental review of the LRDP and, LRDP amendments (the "projects"), the *GHG Reduction Strategy* is intended to ensure that UCSF can answer "no" to the following questions regarding "Greenhouse Gas Emissions" in the Environmental Checklist Form (Appendix G) of the *CEQA Guidelines*:

- VII.a. Will the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?
- VII.b. Will the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs?

The *GHG Reduction Strategy* will require revision over time in response to changes in GHG regulations; changes to existing or planned State, UC, or UCSF GHG reduction programs and policies; or development patterns that diverge from the assumptions made when the LRDP was adopted and/or last amended. Circumstances that may lead to revision of the *GHG Reduction Strategy* are outlined in Section 6.0: Implementation and Monitoring.

[12] http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm

2 Policy and Regulatory Setting

This UCSF *GHG Reduction Strategy* addresses applicable federal, state, regional, local, UC system-wide, and UCSF-specific policies and regulations in effect as of 2020. These are outlined in the following sections.

2.1 Policies and Plans of the Board of Regents of the University of California and University of California Office of the President

In 2007, the Chancellor of UCSF signed the *American College and University President's Climate Commitment* (ACUPCC)[13] to complete an emissions inventory, set target dates and interim milestones for becoming climate-neutral,[14] take steps to reduce GHG emissions, and prepare public progress reports. The University of California Office of the President (UCOP) has established the goals of reducing GHG emissions to 2000 levels by 2014; 1990 levels by 2020; and achieving climate neutrality from scope 1 and 2 sources by 2025. These goals pertain to Scope 1 and Scope 2[15] emissions of the six Kyoto greenhouse gases originating from sources specified in the ACUPCC,[16] and include a target for climate neutrality for Scope 3 emissions from business airline travel and commuting by UCSF staff and students by 2050. The *Sustainable Practices Policy* of the Board of Regents of the University of California (Regents) and the UCOP specifies that these goals will be pursued while maintaining the primary research and education mission of the University.

As outlined in UCSF's *Climate Action Plan* of 2009, the Regents approved and UC President issued the *Sustainable Practices Policy* in 2004, which committed UC to implementing actions intended to minimize the University's impact on the environment and reduce the University's dependence on non-renewable energy. A section on climate was added to the policy in 2007. The policy was most recently revised in July 1, 2019, and now includes updates to the areas of green building design, clean energy, climate protection, sustainable transportation, sustainable building operations, zero waste, sustainable procurement, sustainable foodservice, sustainable water systems and Sustainability at UC Health. The UC *Sustainable Practices Policy* will continue to be updated over time. [17]

[13] American College & University Presidents' Climate Commitment, 2007. www.presidentsclimatecommitment.org/about/commitment

[14] Climate neutrality is defined as the University having a net-zero impact on the Earth's climate; it will be achieved by minimizing GHG emissions as much as possible and by using other measures to mitigate the remaining GHG emissions (*UCSF Climate Action Plan*, December 2009).

[15] For a definition of Scope 1, Scope 2 and Scope 3 GHG emissions, see Section 3.0: "UCSF GHG Emissions Inventory and Forecasts".

[16] The six greenhouse gases identified in the Kyoto Protocol/ACUPCC are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs / C_XF_Y). These are the same six greenhouse gases identified in CEQA Section 15364.5.

[17] The current version of the Policy is available at: http://policy.ucop.edu/doc/3100155/Sustainable%20Practices

The *Sustainable Practices Policy* sets the following additional requirements and goals relevant to GHG emissions reduction:

New Buildings

- All new building projects, other than acute care facilities, shall be designed, constructed, and commissioned to outperform the CBC energy-efficiency standards by at least 20% or meet the whole-building energy performance targets. The University will strive to design, construct, and commission buildings that outperform CBC energy efficiency standards by 30% or more, or meet the stretch whole-building energy performance targets.
- Acute care/hospital facilities and medical office buildings shall be designed, constructed, and commissioned to outperform ASHRAE 90.1 - 2010 by at least 30% or meet the whole-building energy performance targets;
- No new building or major renovation that is approved after June 30, 2019 shall use onsite fossil fuel combustion (e.g., natural gas) for space and water heating (except those projects connected to an existing campus central thermal infrastructure).
- All new buildings will achieve a USGBC LEED "Silver" certification at a minimum. All new buildings will strive to achieve certification at a USGBC LEED "Gold" rating or higher, whenever possible within the constraints of program needs and standard budget parameters.
- All new building projects will achieve at least two points within the available credits in LEED-BD+C's Water Efficiency category.

Renovated Buildings

- Major Renovations of buildings are defined as projects that require 100% replacement of mechanical, electrical and plumbing systems and replacement of over 50% of all non-shell areas (interior walls, doors, floor coverings and ceiling systems) shall at a minimum comply with III.A.4 or III.A.5, above. Such projects shall outperform CBC Title 24, Part 6, currently in effect, by 20%. This does not apply to acute care facilities.
- Acute care facilities and medical office buildings undertaking major renovations as defined above will outperform ASHRAE 90.1- 2010 by 30%.
- Renovation projects with a project cost of $5 million or greater that do not constitute a Major Renovation, shall at a minimum achieve a LEED-ID+C Certified rating and register with the utilities' Savings by Design program, if eligible. This does not apply to acute care facilities.

Clean Energy

- Energy Efficiency: Each location will implement energy efficiency actions in buildings and infrastructure systems to reduce the location's energy use intensity by an average of least 2 percent annually.
- On-campus Renewable Electricity: Campuses and health locations will install additional on-site renewable electricity supplies and energy storage systems whenever cost-effective and/or supportive of the location's Climate Action Plan or other goals.
- Off-campus Clean Electricity: By 2025, each campus and health location will obtain 100% clean electricity. By 2018, the University's Wholesale Power Program will provide 100% clean electricity to participating locations.

- On-campus Combustion: By 2025, at least 40% of the natural gas combusted on-site at each campus and health location will be biogas. This goal may be realized when supply and transport of biogas is financially feasible and CARB certification available.

Climate Protection

Each campus and the UC Office of the President will develop strategies for meeting the following UC goals:

- Climate neutrality from scope 1 and 2 sources by 2025
- Climate neutrality from specific scope 3 sources (as defined by Second Nature's Carbon Commitment)
- Reduce greenhouse gas (GHG) emissions to 1990 levels by 2020, pursuant to the California Global Warming Solutions Act of 2006.

Sustainable Transportation

- Each location will reduce GHG emissions from its fleet and report annually on its progress. Locations shall implement strategies to reduce fleet emissions and improve fuel efficiency of all university-owned or operated fleet vehicles and equipment where practical options exist through acquisition and fleet operation protocols. By 2025, zero emission vehicles or hybrid vehicles shall account for at least 50%of all new light-duty vehicle acquisitions.
- The University recognizes that single-occupant vehicle (SOV) commuting is a primary contributor to commute GHG emissions and localized transportation impacts.
- By 2025, each location shall strive to reduce its percentage of employees and students commuting by SOV by 10% relative to its 2015 SOV commute rates;
- By 2050, each location shall strive to have no more 40% of its employees and no more than 30% of all employees and students commuting to the location by SOV.
- Consistent with the State of California goal of increasing alternative fuel – specifically electric – vehicle usage, the University shall promote purchases and support investment in alternative fuel infrastructure at each location.
- By 2025, each location shall strive to have at least 4.5% of commuter vehicles be ZEV.
- By 2050, each location shall strive to have at least 30% of commuter vehicles be ZEV.
- Each location will develop a business-case analysis for any proposed parking structures serving University affiliates or visitors to campus to document how a capital investment in parking aligns with each campus' Climate Action Plans and/or sustainable transportation policies.

Sustainable Building Operations for Campuses

- Each campus will submit for certification one pilot building at a LEED-O+M "Certified" level or higher.
- Each campus shall register a master site to certify campus-wide LEED-O+M credits and prerequisites to streamline the certification of multiple buildings through the LEED-O+M rating system by July 1, 2015. Each campus shall certify their campus-wide credits as soon as possible after the master site has been registered.
- Each campus shall seek to certify as many buildings as possible through the LEED-O+M rating system, within budgetary constraints and eligibility limitations.

- All locations shall implement an ongoing Green Lab Assessment Program supported by a department on campus to assess operational sustainability of research groups and the laboratories and other research spaces they use by Summer 2018.
- At least one staff or faculty member from the location must have the role of managing the Green Lab Assessment Program.
- Any green lab assessment programs and related efforts will adhere to all relevant UC, state and national policies and laws. Safety will never be compromised to accommodate sustainability goals.
- All locations shall submit a UC Green Laboratories Action Plan by Summer 2018.

Zero Waste

- The University prioritizes waste reduction in the following order: reduce, reuse, and then recycle and compost.
- The University supports the integration of waste, climate and other sustainability goals, including the reduction of embodied carbon in the supply chain through the promotion of a circular economy and the management of organic waste to promote atmospheric carbon reduction. In support of this goal, waste reporting will include tracking estimated scope 3 greenhouse gas emissions.
- The University will reduce per capita total municipal solid waste generation at all locations other than health locations as follows:
  - Reduce waste generation per capita to Fiscal Year (FY) 2015/16 levels by 2020
  - Reduce waste generation by 25% per capita from FY2015/16 levels by 2025
  - Reduce waste generation by 50% per capita from FY2015/16 levels by 2030
- The University will achieve zero waste by 2020 at all locations other than health locations. Minimum compliance for zero waste is 90% diversion of municipal solid waste from landfill.
- By 2020, the University will prohibit the sale, procurement or distribution of packaging foam, such as food containers and packaging material, other than that utilized for laboratory supply or medical packaging and products. The University seeks to reduce, reuse and find alternatives for packaging foam used for laboratory and medical packaging products. No packaging foam or expanded polystyrene shall be used in foodservice facilities for takeaway containers.

Sustainable Procurement

- The University values the health and wellbeing of its students, staff, faculty, visitors, and suppliers. The University seeks to provide healthy and accessible conditions for the communities it serves and this will be considered as a fundamental factor when making procurement decisions. Where functional alternatives to harmful products or impacts exist, they are to be strongly preferred.
- The University prioritizes waste reduction in the following order: reduce, reuse, and then recycle. Accordingly, sustainable procurement will look to reduce unnecessary purchasing first, then prioritize purchase of surplus or multiple use products, before looking at recyclable or compostable products.

The University's sustainable purchasing requirements are:

- 100% compliance with Required Level Green Spend criteria within three fiscal years of the addition of those products and/or product categories to the Guidelines.
- 25% Green Spend as a total percentage of spend per product category; target to be reached within three fiscal years after a category is added to the Guidelines.

- 25% Economically and Socially Responsible Spend as a total percentage of addressable spend; target to be reached within five fiscal years of adoption of this section in the Guidelines.

The University's sustainable purchasing reporting requirements are:

- Reporting on percent Green Spend beginning at the close of the first full Fiscal Year after a category is added to the Guidelines.
- Reporting on percent Economically and Socially Responsible Spend beginning at the close of Fiscal Year 2018/19.
- Reporting on percent Sustainable Spend will be piloted by UCOP beginning at the close of Fiscal Year 2018/19.

Each University's Procurement department will integrate sustainability into its processes and practices, including competitive solicitations, in order to satisfy the sustainable purchasing goals outlined above for products, as well as for the procurement of services. The University will do so by:

- Allocating a minimum of 15% of the points utilized in solicitation evaluations to sustainability criteria. Criteria may include, but is not limited to, sustainable product attributes, supplier diversity, supplier practices, contributions to health and wellbeing, and materials safety.
- Supporting outreach, education and providing equal access to small, diverse, and disadvantaged suppliers for all applicable University procurement opportunities.
- Comparing the Total Cost of Ownership when evaluating costs for goods and services in the selection of suppliers, whenever feasible.
- Targeting sustainable products and services for volume-discounted pricing to make less competitive or emerging sustainable products and services cost competitive with conventional products and services.
- Leveraging its purchasing power and market presence to develop sustainable product and service options where not already available.
- Requiring packaging for all products procured by the University be designed, produced, and distributed to the end user in a sustainable manner.
- Contracting with suppliers of products (e.g. electronics, furniture, lab consumables) that have established (preferably non-manufacturer specific) end-of-life reuse, recycling, and/or takeback programs at no extra cost to the University, and in compliance with applicable federal, state, and University regulations regarding waste disposal.
- Requiring sustainability related purchasing claims to be supported with UC recognized certifications and/or detailed information on proven benefits, durability, recycled content, and recyclability properties, in accordance with the Federal Trade Commission's Green Guides for the use of environmental marketing claims.
- Working with its suppliers to achieve greater transparency and sustainable outcomes throughout the supply chain. This may include maximizing the procurement of products that optimize use of resources from extraction through manufacturing and distribution.
- All procurement staff will consult the UC Sustainable Procurement Guidelines document for minimum mandatory sustainability requirements to be included in solicitations for a given product or service category.

Sustainable Foodservice Operations

- Food Procurement: Each campus and health location foodservice operation shall strive to procure 20% sustainable food products by the year 2020, while maintaining accessibility and affordability for all students and UC Health Location's foodservice patrons.
- Education: Each campus and health location shall provide patrons with access to educational materials that will help support their food choices.
- Engagement with External Stakeholders: Campus and health location departments, organizations, groups, and individuals shall engage in activities with their surrounding communities that support common goals regarding sustainable food systems.
- Sustainable Operations: Campus and health location foodservice operations shall strive to earn third party "green business" certifications for sustainable dining operations.
- Retail foodservice tenants will strive to meet the policies. above. Given the constraints faced by nationally-branded franchises that must purchase food through corporate contracts, location departments managing retail foodservice tenants will have the option of meeting the procuring 20% of all sustainable food products by the year 2020 policy by aggregating the purchases of all retail entities under the jurisdiction of a single operational unit on location.

Sustainable Water Systems

- Locations will reduce growth-adjusted potable water consumption 20% by 2020 and 36% by 2025, when compared to a three-year average baseline of FY2005/06, FY2006/07, and FY2007/08. Locations that achieve this target early are encouraged to set more stringent goals to further reduce potable water consumption. Each Campus shall strive to reduce potable water used for irrigation by converting to recycled water, implementing efficient irrigation systems, drought tolerant planting selections, and/or by removing turf.
- Each location will develop and maintain a Water Action Plan that identifies long term strategies for achieving sustainable water systems. Campuses will include quantification of total square feet of used turf and under-used turf areas on campus as well as a plan for phasing out un-used turf irrigated with potable water.
- Each campus shall identify existing single pass cooling systems and constant flow sterilizers and autoclaves in laboratories and develop a plan for replacement.
- New equipment requiring liquid cooling shall be connected to an existing recirculated building cooling water system, new local chiller vented to building exhaust or outdoors, or to the campus chilled water system through an intervening heat exchange system if available.
- Once through or single pass cooling systems shall not be allowed for softplumbed systems using flexible tubing and quick connect fittings for short term research settings.
- If no alternative to single pass cooling exists, water flow must be automated and controlled to avoid water waste.

Sustainability at UC Health

- Health locations will achieve Practice Greenhealth's award "Greenhealth Partner for Change". Locations will use the definitions in Practice Greenhealth to set medical-center-specific goals for waste diversion and reduction as well as water reduction.
- UC San Francisco Health and UCLA Health have the following targets:

  - By 2020, 50% of total solid waste diverted from landfill and incineration.
  - By 2020, 40lbs of total solid waste per Adjusted Patient Day.
- In line with campus targets, UCLA and UCSF Medical Centers will reduce growth-adjusted potable water consumption 20% by 2020 and 36% by 2025, when compared to a three-year average baseline of FY2005/06, FY2006/07, and FY2007/08.

2.2 UCSF Policy and Plans

UCSF has a robust program covering sustainability activities across the entire campus. Through its Office of Sustainability, UCSF has created work groups of campus stakeholders addressing sustainability in the following areas which have implications for GHG emissions: Carbon Climate Change, Water Conservation, Zero Waste, Green Building, Culture Shift, Sustainable Food, Toxics Reduction, Green Procurement, and Sustainable Operations. It has an active program to involve the campus community in reducing emissions.[18]

UCSF's Sustainability Governance consists of the Academic Senate Sustainability Committee and the Advisory Committee on Sustainability (UACS). The Academic Senate Sustainability Committee identifies faculty recommendations for improving sustainability at UCSF. The charge of the UACS is to:

- Annually examine UCSF's effect on the environment from a comprehensive perspective;
- Evaluate existing UCSF policies, procedures, and programs that affect the environment;
- Serve as a coordinating body for groups or individuals concerned with sustainability issues; and
- Support reduction of greenhouse gas emissions to 1990 levels by 2020 and Carbon Neutrality by 2025

The University have been very active in UC's Carbon Neutrality Initiative, with a particular focus on Carbon Offsets policy.[19] UCSF has had a subcommittee of faculty, staff, and fellows working in late 2019/ early 2020 to develop UCSF's policy and internal guidance on purchasing future carbon offsets. These internal guidelines have been developed to ensure that any purchase of offsets for this purpose will result in additional, verified GHG emissions reductions from actions that align, as much as possible, with UC's research, teaching, and public service mission. Specifically, any voluntary carbon offsets used by UCSF to mitigate GHG emissions will:

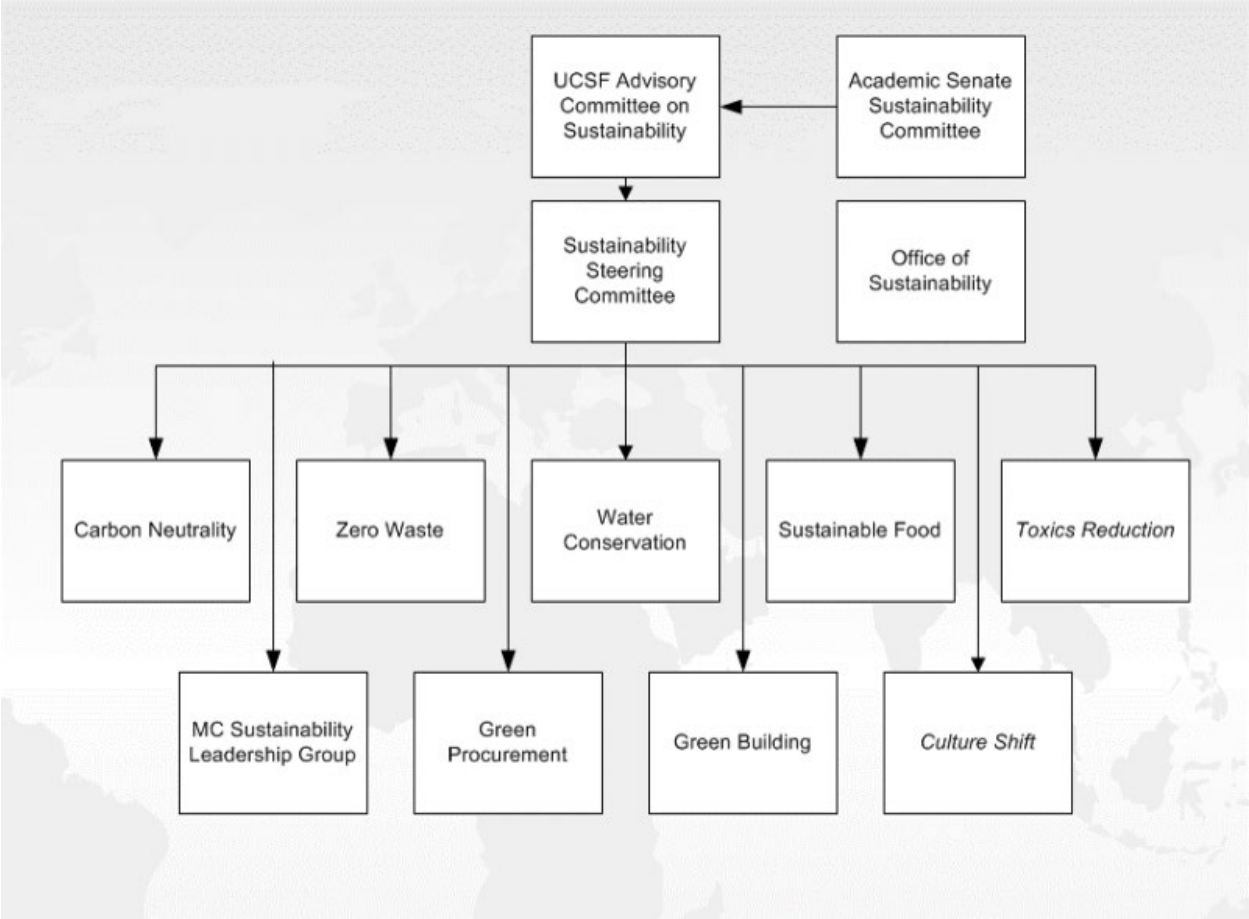
1. Be third-party verified by a major registry recognized by CARB such as CAR (Climate Action Reserve).
2. Be reported publicly and tracked through the Climate Registry (TCR) as required by UC policy. TCR is a non-profit organization governed by U.S. states and Canadian provinces and territories. UCSF's TCR reports will be third-party verified and posted publicly.

[18] https://sustainability.ucsf.edu/getinvolved

[19] https://www.ucop.edu/sustainability/uc-engagement/faculty-engagement/index.html

3. Follow UC's internal criteria for specific offsets types/technologies, projects, and co-benefits developed as part of the UC Carbon Neutrality Initiative in coordination with UC faculty and researchers with expertise in offset quality.

FIGURE 1: UCSF Sustainability Organizational Chart



UCSF includes a Sustainability Dashboard on its Living Green web-site that includes performance metrics for multiple issue areas including GHG emissions. UCSF also publishes an annual sustainability report on its web-site.[20]

UCSF Climate Action Plans

- As part of implementing the UC Sustainable Practices Policy, UCSF developed a Climate Action Plan in 2009, a long-term strategy for voluntarily meeting the State of California's goal for reducing GHG emissions to 1990 levels by 2020, pursuant to AB 32. In addition, as part of the 2014 LRDP, UCSF developed a GHG Reduction Strategy (GHGRS) to provide streamlined analysis under CEQA for future development projects. Both of these documents were updated in 2017, and now, to create a combined UCSF Climate Action Plan – GHGRS to reflect changes that have occurred since 2014 to

[20] https://sustainability.ucsf.edu/what_ucsf_is_doing_2

both the goals outlined in the UC Sustainable Practices Policy and, addition of new campus projects unforeseen at the time of LRDP adoption.

Specifically, this updated GHGRS includes strategies to meet UC goals to achieve climate neutrality from Scope 1 and Scope 2 emissions by 2025, and from Scope 3 emissions by 2050, incorporating the new proposed CPHP development at Parnassus Heights.

UC Strategic Energy Plan

The UC Strategic Energy Plan (SEP) was prepared in 2008 for all UC campuses, to fulfill a goal of UC's *Sustainable Practices Policy* to implement energy efficiency projects in existing buildings. The UCSF portion of the SEP analyzes energy use and GHG trends, and identifies potential energy efficiency retrofit projects for all buildings over 50,000 square feet at UCSF (primarily lighting, HVAC, commissioning and central plant measures). Energy savings, GHG emissions savings, and financial returns are estimated for hundreds of projects, which are grouped into Tier 1 (high priority) and Tier 2 (longer term planning) projects based on their energy savings and financial payback. The SEP project list is intended to be regularly updated every year by each campus to evaluate the feasibility of additional energy-saving measures. The current plan horizon runs to 2025.

Annual GHG Inventory Reporting

The UC *Sustainable Practices Policy* requires each campus to report a GHG emissions inventory to an independent reporting organization. Emissions are also reported to the UC Regents.

UCSF reported Scope 1 and Scope 2 emissions[21] for calendar-year 2008 to the California Climate Action Registry (CCAR). UCSF currently reports its annual Scope 1 and Scope 2 GHG emissions inventory to The Climate Registry (TCR). The most recent inventory reported to TCR was for calendar-year 2018. UCSF emissions inventories reported to outside agencies are verified by accredited independent auditors.

Since 2008, UCSF has also been required to report its annual Scope 1 emissions from the Parnassus Heights Central Utility Plant (PCUP) to the California Air Resources Board (CARB) under the AB 32 Reporting Rule. The PCUP is the only UCSF facility that reaches the threshold for required reporting of emissions to the CARB under AB 32 and federal regulations.

UCSF tracks and reports its progress towards meeting its GHG emissions goals in its Annual Sustainability Report.[22] USCF also reports to the UC Regents annually on its progress in meeting the goals in the UC *Sustainable Practices Policy*. (See Section 3 for more on UCSF's inventories and reporting.)

[21] For more information on UCSF's Scope 1, Scope 2, and Scope 3 GHG emissions, see Section 3.0: UCSF GHG Emissions Inventory and Forecasts.

[22] UCSF Office of Sustainability, Annual Sustainability Report, FY12-13: sustainability.ucsf.edu/what_ucsf_is_doing_2/annual_report_fy12_13

2.3 Federal Regulations

Under the Mandatory Reporting of Greenhouse Gases Rule (74 FR 56260) of the United States Environmental Protection Agency (USEPA or EPA), large emitters of GHGs are required to report their emissions annually to a public database. Under this rule, GHG emissions from the PCUP have been reported annually to the EPA since 2010.

2.4 State of California and Programs and Policies

California has promulgated a series of executive orders, laws, and regulations aimed at reducing both the level of GHGs in the atmosphere and emissions of GHGs from commercial and private activities within the State. The major components of California's climate protection initiative are reviewed below.

California Environmental Quality Act and Senate Bill 97

Under CEQA lead agencies are required to disclose the reasonably foreseeable adverse environmental effects of projects they are considering for approval. GHG emissions have the potential to adversely affect the environment because they contribute to global climate change. In turn, global climate change has the potential to raise sea levels, alter rainfall and snowfall, and affect habitat.

Senate Bill (SB) 97, signed in August 2007, acknowledges that climate change is a prominent environmental issue requiring analysis under CEQA. This bill directed the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the CNRA 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 CNRA was required to certify or adopt those guidelines by January 1, 2010. On December 30, 2009, the CNRA adopted amendments to the State CEQA Guidelines, as required by SB 97. The State CEQA Guidelines amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. The amendments became effective March 18, 2010.

State CEQA Guidelines

The State CEQA Guidelines are embodied in the California Code of Regulations (CCR), Public Resources Code, Division 13, starting with Section 21000. The current State CEQA Guidelines section 15064.4 specifically addresses the significance of GHG emissions, requiring a lead agency to make a "good-faith effort" to "describe, calculate or estimate" GHG emissions in CEQA environmental documents (CNRA, 2018b). Section 15064.4 further states that the analysis of GHG impacts should include consideration of (1) the extent to which the project may increase or reduce GHG emissions, (2) whether the project GHG emissions would exceed a threshold of significance that the lead agency determines applies to the project, and (3) the extent to which the project would comply with "regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions (see, e.g., section 15183.5(b))."

The CEQA Guidelines also state that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program (including plans or regulations for the reduction of greenhouse gas emissions) that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located (State CEQA Guidelines section 15064(h)(3)).

The CEQA Guidelines do not require or recommend a specific analytical methodology or provide quantitative criteria for determining the significance of GHG emissions, nor do they set a numerical threshold of significance for GHG emissions. Section 15064.7(c) clarifies that "when adopting or using thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies or recommended by experts, provided the decision of the lead agency to adopt such thresholds is supported by substantial evidence."

When GHG emissions are found to be significant, CEQA Guidelines section 15126.4(c) includes the following direction on measures to mitigate GHG emissions:

> 'Consistent with Section 15126.4(a), lead agencies shall consider feasible means, supported by substantial evidence and subject to monitoring or reporting, of mitigating the significant effects of greenhouse gas emissions. Measures to mitigate the significant effects of greenhouse gas emissions may include, among others:
>
> (1) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;
>
> (2) Reductions in emissions resulting from a project through implementation of project features, project design, or other measures;
>
> (3) Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions;
>
> (4) Measures that sequester greenhouse gases; and
>
> (5) In the case of the adoption of a plan, such as a general plan, long range development plan, or plans for the reduction of greenhouse gas emissions, mitigation may include the identification of specific measures that may be implemented on a project-by project basis. Mitigation may also include the incorporation of specific measures or policies found in an adopted ordinance or regulation that reduces the cumulative effect of emissions."

State of California Executive Orders

Executive Order S-3-05.

In 2005, in recognition of California's vulnerability to the effects of climate change, then-Governor Arnold Schwarzenegger issued EO S-3-05, which set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

Executive Order S-1-07.

EO S-1-07, which was signed by then-Governor Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, generating more than 40 percent of statewide emissions. It established a low carbon fuel standard (LCFS) with a goal to reduce the carbon intensity of transportation fuels sold in California by at least 10 percent by 2020.

In September 2018, CARB extended the LCFS program to 2030, making significant changes to the design and implementation of the program, including a doubling of the carbon intensity reduction to 20 percent by 2030.

Executive Orders S-14-08 and S-21-09.

In November 2008, then-Governor Schwarzenegger signed EO S-14-08, which expands the State's Renewable Portfolio Standard (RPS) to 33 percent renewable power by 2020. In September 2009, then-Governor Schwarzenegger continued California's commitment to the RPS by signing EO S-21-09, which directs CARB under its AB 32 authority to enact regulations to help the State meet its RPS goal of 33 percent renewable energy by 2020.

Executive Order S-13-08.

Governor Schwarzenegger signed EO S-13-08 on November 14, 2008. The order called on State agencies to develop California's first strategy to identify and prepare for expected climate impacts. As a result, the *2009 California Climate Adaptation Strategy (CAS)* report was developed to summarize the best known science on climate change impacts in the State to assess vulnerability and outline possible solutions that can be implemented within and across State agencies to promote resiliency. The State has also developed an Adaptation Planning Guide (CNRA, 2012) to provide a decision-making framework intended for use by local and regional stakeholders to aid in the interpretation of climate science and to develop a systematic rationale for reducing risks caused or exacerbated by climate change. The State's third major assessment on climate change explores local and statewide vulnerabilities to climate change, highlighting opportunities for taking concrete actions to reduce climate-change impacts.

Executive Order B-16-12.

In March 2012, Governor Jerry Brown issued an executive order establishing a goal of 1.5 million zero emission vehicles (ZEVs) on California roads by 2025. In addition to the ZEV goal, EO B-16-12 stipulated that by 2015 all major cities in California will have adequate infrastructure and be 'zero-emission vehicle ready'; that by 2020 the State will have established adequate infrastructure to support 1 million ZEVs; that by 2050, virtually all personal transportation in the State will be based on ZEVs, and that GHG emissions from the transportation sector will be reduced by 80 percent below 1990 levels.

Executive Order B-30-15. Governor Brown signed EO B-30-15 on April 29, 2015, which directed the following:

- Established a new interim statewide reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030.
- Ordered all State agencies with jurisdiction over sources of GHG emissions to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 reduction targets.
- Directed CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent.

Executive Order B-48-18.

On January 26, 2018, Governor Brown issued an executive order establishing a goal of 5 million ZEVs on California roads by 2030.

Executive Order B-55-18.

On September 10, 2018, Governor Brown signed EO B-55-18, committing California to total, economy-wide carbon neutrality by 2045. EO B-55-18 directs CARB to work with relevant State agencies to develop a framework to implement and accounting that tracks progress toward this goal.

State of California Policy and Legislation

Assembly Bill 1493.

In 2002, then-Governor Gray Davis signed Assembly Bill (AB) 1493. AB 1493 requires that CARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State."

To meet the requirements of AB 1493, in 2004 CARB approved amendments to the California Code of Regulations (CCR) adding GHG emissions standards to California's existing standards for motor vehicle emissions. All mobile sources are required to comply with these regulations as they are phased in from 2009 through 2016.

Because the Pavley standards (named for the bill's author, State Senator Fran Pavley) would impose stricter standards than those under the CAA, California applied to the USEPA for a waiver under the CAA. In 2008, the USEPA denied the application. In 2009, however, the USEPA granted the waiver. The waiver has been extended consistently since 2009; however, in 2018 the USEPA and NHTSA indicated their intent to revoke California's waiver, and prohibit future State emissions standards enacted under the CAA. As of April 2019, the waiver was still in place and the status of the federal government's revocation of the waiver was uncertain.

Senate Bills 1078 and 107.

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 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010.

California Health and Safety Code, Division 25.5 – California Global Warming Solutions Act of 2006 – California Global Warming Solutions Act (Assembly Bill 32 and Senate Bill 32).

In September 2006, then-Governor Arnold Schwarzenegger signed the California Global Warming Solutions Act (AB 32). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished by enforcing a statewide cap on GHG emissions that will be phased in starting in 2012. To

effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

In 2016, Senate Bill (SB) 32 and its companion bill AB 197 amended HSC Division 25.5 and established a new climate pollution reduction target of 40 percent below 1990 levels by 2030 and included provisions to ensure the benefits of State climate policies reach into disadvantaged communities.

Climate Change Scoping Plan.

A specific requirement of AB 32 was to prepare a Climate Change Scoping Plan for achieving the maximum technologically feasible and cost-effective GHG emission reduction by 2020. CARB developed and approved the initial Scoping Plan in 2008, outlining the regulations, market-based approaches, voluntary measures, policies, and other emission reduction programs that would be needed to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the State's long-range climate objectives (CARB, 2008).

The First Update to the Scoping Plan was approved by CARB in May 2014 and built upon the initial Scoping Plan with new strategies and recommendations. CARB approved the 2017 Climate Change Scoping Plan Update (2017 Scoping Plan Update) in December 2017. The 2017 Scoping Plan Update outlines the proposed framework of action for achieving the 2030 GHG target of 40 percent reduction in GHG emissions relative to 1990 levels (CARB, 2017). The 2017 Scoping Plan Update identifies key sectors of the State's implementation strategy, which includes improvements in low carbon energy, industry, transportation sustainability, natural and working lands, waste management, and water. Through a combination of data synthesis and modeling, CARB determined that the target statewide 2030 emissions limit is 260 $MMTCO_2e$, and that further commitments will need to be made to achieve an additional reduction of 50 $MMTCO_2e$ beyond current policies and programs. The cornerstone of the 2017 Scoping Plan Update is an expansion of the Cap-and-Trade program to meet the aggressive 2030 GHG emissions goal and ensure achievement of the 2030 limit set forth by EO B-30-15.

The 2017 Scoping Plan Update's strategy for meeting the State's 2030 GHG target incorporates the full range of legislative actions and State-developed plans that have relevance to the year 2030, including the following, described elsewhere in this section:

- Extending the low carbon fuel standard beyond 2020 and increasing the carbon intensity reduction requirement to at least 18 percent by 2030;
- SB 350, which increase renewables portfolio standard (RPS) to 50 percent and requires a doubling of energy efficiency for existing buildings by 2030;
- The 2016 Mobile Source Strategy to reduce emissions from mobile sources, including an 80 percent reduction in smog-forming emissions and a 45 percent reduction in diesel particulate matter from 2016 level in the South Coast Air Basin, a 45 percent reduction in GHG emissions, and a 50 percent reduction in the consumption of petroleum-based fuels;

- The Sustainable Freight Action Plan to improve freight efficiency and transition to zero emission freight handling technologies (described in more detail below);
- SB 1383, which requires a 50 percent reduction in anthropogenic black carbon and a 40 percent reduction in hydrofluorocarbon and methane emissions below 2013 levels by 2030; and
- Assembly Bill 398, which extends the State Cap-and-Trade Program through 2030.

In the 2017 Scoping Plan Update, CARB recommends statewide targets of no more than six metric tons CO_2e per capita by 2030 and no more than two metric tons CO_2e per capita by 2050. CARB acknowledges that because the statewide per capita targets are based on the statewide GHG emissions inventory that includes all emissions sectors in the State, it is appropriate for local jurisdictions to derive evidence-based local per-capita goals based on local emissions sectors and growth projections.

To demonstrate how a local jurisdiction can achieve their long-term GHG goals at the community plan level, CARB recommends developing a geographically-specific GHG reduction plan (i.e., climate action plan) consistent with the requirements of CEQA section 15183.5(b). A so-called "CEQA-qualified" GHG reduction plan, once adopted, can provide local governments with a streamlining tool for project-level environmental review of GHG emissions, provided there are adequate performance metrics for determining project consistency with the plan. Absent conformity with such a plan, CARB recommends "that projects incorporate design features and GHG reduction measures, to the degree feasible, to minimize GHG emissions. Achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development" (CARB, 2017).[23] While acknowledging that recent land use development projects in California have demonstrated the feasibility to achieve zero net additional GHG emissions (e.g., Newhall Ranch Resource Management and Development Plan), the 2017 Scoping Plan Update states that "Achieving net zero increases in GHG emissions, resulting in no contribution to GHG impacts, may not be feasible or appropriate for every project, however, and the inability of a project to mitigate its GHG emissions to net zero does not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA. Lead agencies have the discretion to develop evidence-based numeric thresholds (mass emissions, per capita, or per service population) consistent with this Scoping Plan, the State's long-term GHG goals, and climate change science…To the degree a project relies on GHG mitigation measures, CARB recommends that lead agencies prioritize on-site design features that reduce emissions, especially from VMT, and direct investments in GHG reductions within the project's region that contribute potential air quality, health, and economic co-benefits locally" (CARB, 2017).[24]

Cap-and-Trade Program.

Initially authorized by the California Global Warming Solutions Act of 2006 (AB 32), and extended through the year 2030 with the passage of Assembly Bill 398 (2017), the California Cap-and-Trade Program is a core strategy that the State is using to meet its GHG reduction targets for 2020 and 2030, and ultimately achieve an 80 percent reduction from 1990 levels by 2050. CARB designed and adopted the California Cap-

[23] At pages 100 - 101.

[24] At page 102.

and-Trade Program to reduce GHG emissions from "covered entities"[25] (e.g., electricity generation, petroleum refining, cement production, and large industrial facilities that emit more than 25,000 metric tons CO_2e per year), setting a firm cap on statewide GHG emissions and employing market mechanisms to achieve reductions.[26] Under the Cap-and-Trade Program, an overall limit is established for GHG emissions from capped sectors. The statewide cap for GHG emissions from the capped sectors commenced in 2013. The cap declines over time. Facilities subject to the cap can trade permits to emit GHGs.[27]

Up to eight percent of a covered entity's compliance obligation can be met using carbon offset credits, which are created through the development of projects, such as renewable energy generation or carbon sequestration projects, that achieve a reduction of emissions or an increase in the removal of carbon from the atmosphere from activities not otherwise regulated, covered under the cap, or resulting from government incentives. Offsets are verified reductions of emissions whose ownership can be transferred to others. As required by AB 32, any reduction of GHG emissions used for compliance purposes must be real, permanent, quantifiable, verifiable, enforceable, and additional. California Carbon Offsets (CCOs) used to meet regulatory requirements must be quantified according to CARB-adopted methodologies, and CARB must adopt a regulation to verify and enforce the reductions. The criteria developed will ensure that the reductions are quantified accurately and are not double-counted within the system (CARB, 2008).[28]

If California's direct regulatory measures reduce GHG emissions more than expected, then the Cap-and-Trade Program will be responsible for relatively fewer emissions reductions. If California's direct regulatory measures reduce GHG emissions less than expected, then the Cap-and-Trade Program will require relatively more emissions reductions. In other words, the Cap-and-Trade Program can be adaptively managed by the State to ensure achievement of California's 2020 and 2030 GHG emissions reduction mandates, depending on whether other regulatory measures are more or less effective than anticipated.

Senate Bill 375.

Signed into law on October 1, 2008, SB 375 supplements GHG reductions from new vehicle technology and fuel standards with reductions from more efficient land use patterns and improved transportation. Under the law, CARB approved GHG reduction targets in February 2011 for California's 18 federally designated regional planning bodies, known as Metropolitan Planning Organizations (MPOs). CARB may update the targets every four years and must update them every eight years. MPOs in turn must demonstrate how their plans, policies and transportation investments meet the targets set by CARB

[25] "Covered Entity" means an entity within California that has one or more of the processes or operations and has a compliance obligation as specified in subarticle 7 of the Cap-and-Trade Regulation; and that has emitted, produced, imported, manufactured, or delivered in 2008 or any subsequent year more than the applicable threshold level specified in section 95812 (a) of the Regulation.

[26] 17 CCR §§ 95800 to 96023.

[27] See generally 17 CCR §§ 95811, 95812.

[28] Climate Reserve Tonnes (CRTs). When CRTs are transferred to a retirement account in the Reserve System, they are considered retired. Retirement accounts are permanent and locked to prevent a retired CRT from being transferred again.

through Sustainable Communities Strategy. The original target reductions for the Bay Area are a regional reduction of per-capita CO_2 emissions from cars and light-duty trucks by 7 percent by 2020 and by 15 percent by 2035, compared to a 2005 baseline. The year 2035 reduction target has since been revised in 2018 to reduce per capita vehicular GHG emissions 19 percent by 2035 from a 2005 baseline. ABAG addresses these goals in *Plan Bay Area*, which identifies Priority Development areas near transit options to reduce use of on-road vehicles.

Senate Bill X 1-2.

Senate Bill X 1-2, signed by Governor Brown in April 2011, enacted the California Renewable Energy Resources Act. The law obligates all California electricity providers, including investor-owned and publicly-owned utilities, to obtain at least 33 percent of their energy from renewable resources by the year 2020.

Advanced Clean Cars Program.

In January 2012, pursuant to Recommended Measures T-1 and T-4 of the Scoping Plan, CARB approved the Advanced Clean Cars Program, a new emissions-control program for model year 2017 through 2025.The program combines the control of smog, soot, and GHGs with requirements for greater numbers of zero-emission vehicles. By 2025, when the rules will be fully implemented, the new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions.

The program also requires car manufacturers to offer for sale an increasing number of zero-emission vehicles (ZEVs) each year, including battery electric, fuel cell, and plug-in hybrid electric vehicles. In December 2012, CARB adopted regulations allowing car manufacturers to comply with California's GHG emissions requirements for model years 2017-2025 through compliance with the USEPA GHG requirements for those same model years.

Senate Bill 743.

In 2013, Governor Brown signed Senate Bill (SB) 743, which added Public Resources Code section 21099 to CEQA, to change the way that transportation impacts are analyzed under CEQA to better align local environmental review with statewide objectives to reduce GHG emissions, encourage infill mixed-use development in designated priority development areas, reduce regional sprawl development, and reduce VMT in California.[29]

As required under SB 743, OPR developed potential metrics to measure transportation impacts that may include, but are not limited to, vehicle miles traveled (VMT), VMT per capita, automobile trip generation rates, or automobile trips generated. The new VMT metric is intended replace the use of automobile delay and level of service (LOS) as the metric to analyze transportation impacts under CEQA. In its 2018 Technical Advisory on Evaluating Transportation Impacts in CEQA, OPR recommends different thresholds of significance for projects depending on land use types. For example, residential and office

[29] Steinberg. 2013. Available online at http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140SB743, accessed on March 10, 2017.

space projects must demonstrate a VMT level that is 15 percent less than that of existing development to determine whether the mobile-source GHG emissions associated with the project are consistent with statewide GHG reduction targets. With respect to retail land uses, any net increase of VMT may be sufficient to indicate a significant transportation impact (OPR, 2018b). In 2016, the City of San Francisco adopted local VMT metrics to implement the directive from SB 743.

Mobile Source Strategy (2016).

Implementing CARB's Mobile Source Strategy includes measures to reduce total light-duty VMT by 15 percent from the business-as-usual in 2050. The Mobile Source Strategy includes an expansion of the Advanced Clean Cars Program (which further increases the stringency of GHG emissions for all light-duty vehicles, and 4.2 million zero-emission and plug-in hybrid light-duty vehicles by 2030). It also calls for more stringent GHG requirements for light-duty vehicles beyond 2025 as well as GHG reductions from medium-duty and heavy-duty vehicles and increased deployment of zero-emission trucks primarily for class 3 – 7 "last mile" delivery trucks in California. Statewide, the Mobile Source Strategy would result in a 45 percent reduction in GHG emissions, and a 50 percent reduction in the consumption of petroleum-based fuels by 2030/2031.

California Sustainable Freight Action Plan (2016).

California Sustainable Freight Action Plan includes strategies to improve freight efficiency and transition to zero emission freight handling technologies. It includes goals to achieve 25 percent improvement of freight system efficiency by 2030, and to deploy over 100,000 freight vehicles and equipment capable of zero emission operation by 2030, and maximize near-zero emission freight vehicles and equipment powered by renewable energy by 2030 (Caltrans, 2016).

Senate Bill 350.

The Clean Energy and Pollution Reduction Act of 2015. SB 350 (Chapter 547, Statutes of 2015) was approved by Governor Brown on October 7, 2015. SB 350 increased the standards of the California Renewable Portfolio Standards (RPS) program by requiring that the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased from 33 percent to 50 percent by December 31, 2030. The Act requires the State Energy Resources Conservation and Development Commission to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in existing electricity and natural gas final end uses of retail customers by January 1, 2030.

Senate Bill 100.

On September 10, 2018, Governor Brown signed SB 100, establishing that 100 percent of all electricity in California must be obtained from renewable and zero-carbon energy resources by December 31, 2045. SB 100 also creates new standards for the RPS goals that were established by SB 350 in 2015. Specifically, the bill increases required energy from renewable sources for both investor-owned utilities and publicly-owned utilities from 50 percent to 60 percent by 2030. Incrementally, these energy providers must also have a renewable energy supply of 33 percent by 2020, 44 percent by 2024, and 52 percent by 2027. The

updated RPS goals are considered achievable, since many California energy providers are already meeting or exceeding the RPS goals established by SB 350.

SB 1383 (Short-lived Climate Pollutants).

Senate Bill 1383, passed in 2016, requires statewide reductions in short-lived climate pollutants (SLCPs) across various industry sectors. The SLCPs covered under AB 1383 include methane, fluorinated gases, and black carbon – all GHGs with a much higher warming impact than carbon dioxide and with the potential to have detrimental effects on human health. SB 1383 requires CARB to adopt a strategy to reduce methane by 40 percent, hydrofluorocarbon gases by 40 percent, and anthropogenic black carbon by 50 percent below 2013 levels by 2030. The methane emission reduction goals include a 75 percent reduction in the level of statewide disposal of organic waste from 2014 levels by 2025.

California Assembly Bill 341. AB 341, which became law in 2011, establishes a new statewide goal of 75 percent recycling through source reduction, recycling, and composting by 2020, and changed the way that the State measures progress toward the 75 percent recycling goal, focusing on source reduction, recycling and composting. AB 341 also requires all businesses and public entities that generate 4 cubic yards or more of waste per week to have a recycling program in place. The purpose of the law is to reduce GHG emissions by diverting commercial solid waste to recycling efforts and expand the opportunity for additional recycling services and recycling manufacturing facilities in California (CalRecycle, 2019).

California Assembly Bill 1826. AB 1826, known as the Commercial Organic Waste Recycling Law, became effective on January 1, 2016, and requires businesses and multi-family complexes (with 5 units or more) that generate specified amounts of organic waste (compost) to arrange for organics collection services. The law phases in the requirements on businesses with full implementation realized in 2019:

- *First Tier*: Commencing in April 2016, the first tier of affected businesses included those that generate eight or more cubic yards of organic materials per week.
- *Second Tier*: In January 2017, the affected businesses expanded to include those that generate four or more cubic yards of organic materials per week.
- *Third Tier*: In January 2019, the affected businesses are further expanded to include those that generate four or more cubic yards of commercial solid waste per week.

State of California Building Codes

California Building and Energy Efficiency Standards (Title 24).

The CEC first adopted Energy Efficiency Standards for Residential and Nonresidential Buildings (CCR, Title 24, Part 6) in 1978 in response to a legislative mandate to reduce energy consumption in the State. Although not originally intended to reduce GHG emissions, increased energy efficiency and reduced consumption of electricity, natural gas, and other fuels would result in fewer GHG emissions from residential and nonresidential buildings subject to the standard. The standards are updated periodically (typically every three years) to allow for the consideration and inclusion of new energy efficiency technologies and methods (CEC, 2016).

The current Title 24, Part 6 standards (2016 standards) were made effective on January 1, 2017. The next update to the Title 24 energy efficiency standards (2019 standards) goes into effect on January 1, 2020.

California Green Buildings Standards Code (CALGreen).

Part 11 of the Title 24 Building Energy Efficiency Standards is referred to as the California Green Building Standards (CALGreen) Code. CALGreen is intended to encourage more sustainable and environmentally friendly building practices, require low-pollution emitting substances that cause less harm to the environment, conserve natural resources, and promote the use of energy-efficient materials and equipment. Since 2011, the CALGreen Code is mandatory for all new residential and non-residential buildings constructed in the State. Such mandatory measures include energy efficiency, water conservation, material conservation, planning and design and overall environmental quality. The CALGreen Code was most recently updated in 2016 to include new mandatory measures for residential and nonresidential uses; the new measures took effect on January 1, 2017 (California Building Standards Commission, 2016).

2.5 Regional Plans and Policies

Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) is the regional government agency that regulates stationary sources of air pollution within the nine San Francisco Bay Area counties. BAAQMD regulates GHG emissions through the following plans, programs, and guidelines.

Clean Air Plan.

BAAQMD and other air districts prepare clean air plans in accordance with the state and federal Clean Air Acts. On April 19, 2017, the BAAQMD Board of Directors adopted the 2017 Clean Air Plan Spare the Air, Cool the Climate, an update to the 2010 Clean Air Plan. The Clean Air Plan is a comprehensive plan that focuses on the closely-related goals of protecting public health and protecting the climate. Consistent with the State's GHG reduction targets, the plan lays the groundwork for a long-term effort to reduce Bay area GHG emissions 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050.

As part of the Basin-Wide Methane Strategy outlined in the 2017 Clean Air Plan, the BAAQMD is currently developing a new regulation to address significant releases of methane in the Bay Area, called *Regulation 13, Rule 1: Significant Methane Releases*, which would serve as a general backstop rule to address releases of methane from regulated sources.

BAAQMD Climate Protection Program.

The 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 GHG and in reducing air pollutants that affect the health of residents. The 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 CEQA Air Quality Guidelines.

The BAAQMD CEQA Air Quality Guidelines were prepared to assist in the evaluation of air quality impacts of projects and plans proposed within the Bay Area. The guidelines provide recommended procedures for evaluating potential air impacts during the environmental review process, consistent with CEQA requirements, and include recommended thresholds of significance, mitigation measures, and background air quality information. The guidelines also include recommended assessment methodologies for air toxics, odors, and greenhouse gas emissions. In June 2010, the BAAQMD's Board of Directors adopted CEQA thresholds of significance and an update of the CEQA Guidelines, which included significance thresholds for GHG emissions based on the emission reduction goals for 2020 articulated by the State Legislature in AB 32. The first threshold, 1,100 MT CO_2e per year, is a numeric emissions level below which a project's contribution to global climate change would be less than cumulatively considerable. For larger and mixed-use projects, the Guidelines state that emissions would be less than cumulatively significant if the project as a whole would result in an efficiency of 4.6 MT CO_2e per service population or better (BAAQMD, 2010).

On March 5, 2012, the Alameda County Superior Court issued a judgment finding that the BAAQMD had failed to comply with CEQA when it adopted the thresholds of significance in the BAAQMD CEQA Air Quality Guidelines. That decision was appealed to the Court of Appeal and one of the issues in the case has been decided by the California Supreme Court. The Supreme Court found that CEQA does not require an analysis of how existing environmental conditions will impact future residents or users of a proposed project, and remanded the case down for the lower court to decide remaining issues. Following the Superior Court order, the BAAQMD released revised *CEQA Air Quality Guidelines* in May of 2012 that include guidance on calculating air pollutant emissions, obtaining information regarding the health impacts of air pollutants, and identifying potential mitigation measures, and which set aside the significance thresholds. There was no challenge to BAAQMD's 2010 greenhouse gas emissions thresholds or the substantial evidence supporting those thresholds (BAAQMD, 2012). In May 2017, the Air District published a new version of the Guidelines, which included no changes to the quantitative greenhouse gas thresholds, but presented them as guidance and recommended that lead agencies consider the information to develop their own thresholds of significance.

Under BAAQMD's current *CEQA Air Quality Guidelines*, a local government may prepare and adopt a qualified GHG Reduction Strategy that is consistent with AB 32 goals. If a project is consistent with an adopted qualified GHG Reduction Strategy and General Plan that addresses the project's GHG emissions, it can be presumed that the project will not have significant GHG emissions under CEQA (BAAQMD, 2017a).

Metropolitan Transportation Commission/Association of Bay Area Governments Sustainable Communities Strategy

MTC is the federally recognized MPO for the nine county Bay Area. On July 18, 2013, the Plan Bay Area was jointly approved by ABAG's Executive Board and by MTC. The Plan includes the region's Sustainable Communities Strategy, as required under SB 375, and the 2040 Regional Transportation Plan. The Sustainable Communities Strategy lays out how the region will meet GHG reduction targets set by CARB. CARB's current targets call for the region to reduce per capita vehicular GHG emissions 10 percent by 2020 and 19 percent by 2035 from a 2005 baseline.[30] A central greenhouse gas reduction strategy of Plan Bay Area is the concentration of future growth within Priority Development Areas (PDAs) and Transit Priority Areas (TPAs). To be eligible for PDA designation, an area must be within an existing community, near existing or planned fixed transit or served by comparable bus service, and planned for more housing. To be eligible for PDA designation, an area must be within an existing community, near existing or planned fixed transit or served by comparable bus service, and planned for more housing. A TPA is an area within one-half mile of an existing or planned major transit stop such as a rail transit station, a ferry terminal served by transit, or the intersection of two or more major bus routes (MTC, 2013).

On July 26, 2017, MTC adopted Plan Bay Area 2040, a focused update that builds upon the growth pattern and strategies developed in the original Plan Bay Area but with updated planning assumptions that incorporate key economic, demographic and financial trends since the original plan was adopted (MTC, 2017).

2.6 City and County of San Francisco Plans and Policies

Pursuant to Article 9, Section 9 of the California State Constitution, UCSF is constitutionally exempt from local land use regulations whenever using property under its control in furtherance of its educational purposes. This authority includes University master planning and oversight of land uses and the development, maintenance and use of physical facilities under UCSF control. Thus, the following City plans and policies do not apply to UCSF and are presented for informational purposes only. The following is a general discussion of CCSF policy with respect to GHG emissions.

San Francisco Greenhouse Gas Reduction Ordinance

In May 2008, the CCSF adopted Ordinance No. 81-08 amending the San Francisco Environment Code to establish GHG emissions targets and departmental action plans and to authorize the San Francisco Department of the Environment to coordinate efforts to meet these targets. The City ordinance establishes the following GHG emissions reduction limits and target dates by which to achieve them: determine 1990 Citywide GHG emissions by 2008, the baseline level, with reference to which target reductions are set; reduce GHG emissions by 25 percent below 1990 levels by 2017; reduce GHG emissions by 40 percent below 1990 levels by 2025; and reduce GHG emissions by 80 percent below 1990 levels by 2050. The City's GHG reduction targets are consistent with—in fact, more ambitious than—those set forth in

[30] CARB, 2018. SB 375 Regional Greenhouse Gas Emissions Reduction Targets. Available: https://www.arb.ca.gov/cc/sb375/finaltargets2018.pdf. Accessed: March 11, 2019.

Governor Brown's recent Executive Order B-30-15 by targeting a 40 percent reduction by 2025 rather than a 40 percent reduction by 2030.

San Francisco Greenhouse Gas Reduction Strategy

San Francisco has developed a number of plans and programs to reduce the City's contribution to global climate change and to meet the goals of the City's Greenhouse Gas Reduction Ordinance. San Francisco's Greenhouse Gas Reduction Strategy documents its actions to pursue cleaner energy, energy conservation, and alternative transportation and solid waste policies. For instance, the City has implemented mandatory requirements and incentives that have measurably reduced GHG emissions including, but not limited to, increasing the energy efficiency of new and existing buildings, installation of solar panels on building roofs, implementation of a green building strategy, adoption of a zero waste strategy, a construction and demolition debris recovery ordinance, a solar energy generation subsidy, incorporation of alternative fuel vehicles in the City's transportation fleet (including buses), and a mandatory recycling and composting ordinance. The strategy also identifies 42 specific regulations for new development that would reduce a project's GHG emissions.

San Francisco's policies and programs have resulted in a reduction in GHG emissions to below 1990 levels, exceeding statewide AB 32 GHG reduction goals. San Francisco's GHG emissions in 2010 were 5.3 million metric tons CO_2e, which represents a 14.5 percent reduction in GHG emissions compared to 1990 levels (6.2 million metric tons CO_2e). The reduction is largely a result of reduced GHG emissions from the electricity sector, from 2.0 million metric tons CO_2e (1990) to 1.3 million metric tons CO_2e (2010), and the waste sector, from 0.5 million metric tons CO_2e (1990) to 0.2 million metric tons CO_2e (2010) (SF DOE, 2013).

UCSF sustainability staff actively engage with the SF Department of Environment to ensure that the university coordinates it activities on City initiatives that reduce GHG emissions.

3 UCSF GHG Emissions Inventory and Forecasts

UCSF has inventoried its campus-wide GHG emissions for many calendar years, including 1990, 2000, and every year since 2007,[31] using standard accounting protocols from the California Climate Action Registry (CCAR), The Climate Registry (TCR), the California Air Resources Board (CARB), and the United States Environmental Protection Agency (USEPA), as discussed in section 2. Reporting rules, protocols, and registries have evolved over this time, with the CCAR no longer active and TCR taking over as the leading national registry for voluntary reporting. As a major stationary source (greater than 25,000 metric tons (mt) CO_2e per year) and electric power producer, the Parnassus Central Utility Plant (PCUP) falls under state and federal reporting requirements. Since 2008, PCUP emissions have been reported to CARB under California's GHG Mandatory Reporting Regulation; and since 2010 PCUP emissions have been report to USEPA under the Greenhouse Gas Reporting Rule (74 FR 56260).

Organizational Boundary

All of the standardized GHG reporting protocols and methodologies require a clear delineation of the organizational and operational boundaries used to account for emissions in an inventory. The organizational boundary includes all facilities and GHG sources over which the reporting entity has management control. Management control can be defined in either financial or operational terms, but the boundary definition must be applied consistently across the organization. Through calendar year 2011, the UCSF inventory based its organizational boundary on the operational control criterion, which requires inclusion of all wholly-owned facilities, and all facilities for which UCSF has operational control through an operational lease or other means. Facilities with which UCSF has an affiliation agreement but not operational control, such as leased space at the City owned Zuckerberg San Francisco General Hospital (ZSFGH) or the federally owned Veterans Affairs Medical Center (VAMC), have reported their emissions separately through their own documents.

Starting with the 2012 GHG inventory reported to TCR, UCSF delineates its organizational boundary using the financial control criterion. Under financial control, UCSF reports emissions from facilities and sources that are wholly-owned, and from facilities and sources that are partially-owned but where UCSF retains financial control (e.g., through a capital or financial lease, or where majority ownership establishes management control). Due to this organizational boundary change, pre-2012 inventories in this *GHG Reduction Strategy* are presented with boundary adjustments to enable direct comparison with current and future inventories. Essentially, emissions associated with leased facilities are removed from the pre-2012 inventories.

Operational Boundary

The operational boundary describes the direct and indirect sources of GHG emissions included in the inventory. GHG reporting protocols generally break emissions down into three source categories related

[31] https://sustainability.ucsf.edu/what_ucsf_is_doing_2 And

https://ucop.edu/sustainability/policy-areas/annual-reports.html

to the level of operational control exercised by the organization over the emission source. For UCSF, the following sources are included:

- Scope 1 Emissions – Direct emissions, including stationary combustion such as boilers, hydrofluorocarbon (HFC) refrigerant use, and some medical gases (anesthesia), as well as non-stationary combustion of fuels in University-owned vehicles.
- Scope 2 Emissions – Indirect stationary sources, including emissions from purchased electricity and purchased steam for leased facilities.
- Scope 3 Emissions – Other indirect emissions from business air travel and from commuting by students, faculty, and staff. Scope 3 is defined as emissions that are a consequence of the activities of the institution, but occur from sources not owned or controlled by the institution.

UC's *Sustainable Practices Policy* stipulates that each UC campus will annually inventory its GHG emissions in accordance with TCR requirements, to include Scope 1 and Scope 2 emissions as well as Scope 3 emissions from business air travel and from commuting by students, faculty and staff.[32] Inclusion of Scope 3 emissions is optional for TCR reporting, and when reported they are generally not third-party verified.

The standardized reporting methodology also incorporates protocols for carbon sequestration accounting – e.g., 'credits' for items such as institution-owned large tracts of forest land held as 'permanent' (100 year) open space. Although UCSF owns the Mount Sutro Open Space Reserve located at the Parnassus Heights campus site, UCSF GHG inventories do not account for carbon sequestration in the Reserve. Forest land policy, and the use of forestry carbon offsets are currently being discussed by UC at the system level. Future updates of UCSF's *Climate Action Plan* may include offsets attributable to forest management, either on University or third party owned land. The University has prepared a vegetation management plan to assess the health of the Mount Sutro forest, and manages the land while balancing multiple goals such as wildland fire prevention, bio-diversity, and carbon sequestration. If a significant change[33] in land use or a forest coverage occurs, the net change in sequestered carbon associated with that change would be evaluated and may be included in a future inventory.

Establishing a Baseline

There are different requirements for and varying guidance regarding the various reporting rules for establishing a GHG emissions baseline. BAAQMD's guidance for a qualified GHG reduction strategy is to set the baseline inventory as calendar-year 2008 or earlier. Important considerations in setting the baseline include the accuracy and completeness of underlying data, and the role of the baseline in forecasting future emissions and setting reduction targets.

[32] Although UCSF has in the past (e.g., 2009 Climate Action Plan) included estimates of Scope 3 emissions from wastewater treatment and off-site disposal of solid waste, UC policy does not require their inclusion in annual inventory reporting to the UC Regents or to TCR. Together, these sources accounted for approximately two percent of total emissions in UCSF's 1990 and 2008 inventories.

[33] Significant defined as more than 10% of the 61 acre reserve; i.e., more than 6.1 acres.

AB 32 requires the state to reduce GHG emission to 1990 levels by 2020. Since most communities and facilities covered under AB 32 do not have access to high quality data for estimating 1990 GHG emissions, CARB and the California Attorney General recommend that plan-level GHG reduction strategies target 2020 emissions at 15 percent below a 2008 (or earlier) baseline. (132,888 mt CO2e) From a statewide perspective, CARB has determined that 15 percent below 2008 is approximately equivalent to 1990 levels. [34] This approach to setting a 2020 target is supported by BAAQMD[35] and OPR, and represents current best practice for climate action plans and general plans adopted by cities and public agencies throughout California. (More on the GHG Reduction Strategy approach to setting future emission targets and establishing a CEQA threshold is provided in the next section.)

Inventory Results

Table 1 provides a summary of campus-wide GHG inventories for 1990, 2008, and 2018 (the most recently reported year). The inventories contain all sources within the operational boundary prescribed by UCOP's *Sustainable Practices Policy*, which includes all Scope 1 and Scope 2 emissions as well as Scope 3 emissions from business air travel and commuting by students, faculty and staff. A subtotal is provided for Scope 1 and Scope 2 emissions, reflecting the operational boundary associated with the UC President's carbon neutral initiative. The results show that total Scope 1, 2, and 3 GHG emissions increased from 109,817 mt CO_2e in 1990 to 156,339 mt CO_2e in 2008 (a 42 percent increase), and subsequently dropped to 158,372 mt CO_2e in 2018 – despite the opening of over 2 million gross square feet of new campus space since 2008.

TABLE 1: UCSF GHG Emissions Inventories (values in mt CO_2e)

Scope	Emission Category	1990	1990%	2008	2008%	2018	2018%
1	Buildings and Facilities – Natural Gas	44,923	40.9%	90,026	57.6%	80,420	50.8%
1	Buildings and Facilities – Other Fuels	114	0.1%	NA	NA	197	0.1%
1	UCSF Fleet	1,944	1.8%	3,200	2.0%	2,714	1.7%
1	Refrigerants and Medical Gases	3,500	3.2%	3,500	2.2%	1,656	1.0%
1	CCAR Acquisition Adjustment	10,178	9.3%	NA	NA	NA	NA
2	Buildings and Facilities - Electricity	24,529	22.3%	24,962	16.0%	29,108	18.4%
	Scope 1 and 2 Subtotal	*85,188*	*77.6%*	*121,688*	*77.8%*	*114,095*	*72.0%*
3	Business Air Travel	7,549	6.9%	12,582	8.0%	18,748	11.8%
3	Commute	17,080	15.6%	22,069	14.1%	25,529	16.1%
	Scope 1, 2, and 3 Total	109,817	100.0%	156,339	100.0%	158,372	100.0%

SOURCE: University of California, San Francisco (UCSF), *UCSF Climate Action Plan –Greenhouse Gas Reduction Strategy*, April 2017 and TCR 2018 Summary, 2019. 2018 inventory does not reflect 4,396 mt CO2e of offsets taken by UCSF. This allows equal comparison across years of un-offset emissions. Note that emissions reported in the Annual Sustainability Report only include Scope 3 mobile emissions under UCSF's control from employee air travel and commute. Emissions from travel by patients and visitors are not included in the GHGRS.

The following sections provide more detail on each inventory, highlighting similarities, differences, and data quality.

[34] In its Climate Change Scoping Plan of September 2008, CARB recommends that local governments adopt a GHG reduction target consistent with the State's commitment to reach 1990 levels by 2020. This is identified as equivalent to 15 percent below "current" levels.

[35] BAAQMD's CEQA Guidelines (updated May 2012)

1990 Inventory

UCSF's earliest GHG inventory (calendar year 1990) is largely based on actual 1990 activity data, but there are several sources for which accurate or complete data is not available, leaving a certain amount of uncertainty in the GHG emissions estimates for those sources. As mentioned in Section 2.2 and explained further below, this data reflects an adjustment made to the 1990 inventory as it appeared in the 2009 *Climate Action Plan* to correct for an accounting error discovered during development of this *GHG Reduction Strategy*; when the 1990 inventory was first developed, only half of the utility data was aggregated, so the initial 1990 emissions estimates for energy included in the 2009 *Climate Action Plan* were erroneously low. In Table 1, the adjusted values for natural gas and electricity emissions account for a full year of energy data. In addition, also as previously discussed, emissions from electricity used by leased buildings were removed from the calculations shown in Table 1 to maintain consistency with the organizational boundary change that was made starting with the 2012 inventory (from operational to financial control). The 1990 inventory has not been independently audited, nor has it been submitted to a GHG emissions registry.

The largest of the 1990 inventory contributing sectors, Buildings and Facilities natural gas (40.9 percent of total) and Buildings and Facilities electricity consumption (22.3 percent), are based on actual utility consumption data tracked in the billing system. However, the utility data represents fiscal year 1989-1990, which is an approximation of calendar-year 1990. Building records show that no significant development occurred on the campus that year.

The third-largest contributor to 1990 GHG emissions, the commute to work (15.6 percent of total), was estimated based on a comprehensive transportation survey that UCSF prepared in 1991, which accounts for both mode-split and trip lengths, as explained in the 2009 UCSF *Climate Action Plan*. Other sectors of this inventory, such as UCSF Fleet fuel consumption, did not have centralized record keeping in place in 1990, and were estimated based on an algorithm combining 2008 data scaled to the facility size and population at that time (i.e., fleet emissions are based on 2008 actual fuel consumption data scaled to the 1990 facility size and population). Similarly, 'Refrigerants and Medical Gases' emissions data are an estimate based on 2008 known usage scaled to the conditions that existed in 1990. (Medical gas use is largely dependent on hospital stays; UCSF did not experience a significant change in the size or use of inpatient clinical facilities between 1990 and 2008.)

Following standard GHG accounting protocol, the CCAR acquisition adjustment accounts for the transfer of historical emissions associated with land and buildings purchased by UCSF after 1990. This adjustment methodology is in place so that an institution that has goals related to meeting 1990 emissions levels can accurately account for enterprise-wide emissions source changes through time. In a series of acquisitions, starting in 1998, UCSF acquired a new 61-acre campus site in the formerly industrial Mission Bay South Redevelopment Area of San Francisco. The 1990 historical emissions from this acquired site are represented by the CCAR acquisition adjustment, and are now included in all UCSF inventories since 2008.

2008 Inventory

The 2008 GHG inventory was the first of the UCSF inventories to be audited by an accredited third-party verifier, providing a high degree of confidence in the accuracy and completeness of the underlying data

and emissions calculations. The 2008 inventory (Scope 1 and Scope 2 emissions) was reported to the CCAR, while the 2008 emissions from the PCUP were reported to CARB under California's GHG Mandatory Reporting Regulation. The 2008 figures provided in Table 1 do not include emissions from electricity used by leased buildings; this is in order to maintain consistency with the organizational boundary change that was made starting with the 2012 inventory (from operational to financial control). Emissions associated with leased buildings are addressed in the City of San Francisco and CARB inventories.

As described in the 2009 *Climate Action Plan*, emissions estimates for all sectors included in the adjusted 2008 inventory are based on actual activity data (utility natural gas and electricity usage, fleet fuel consumption; etc.). As with the 1990 inventory, the Commute emissions estimate is based on a comprehensive transportation survey for 2008.

2018 Inventory

UCSF's latest GHG inventory (calendar-year 2018) was third-party verified and reported to TCR. The TCR Reporting Protocol requires quantification of all Scope 1 and Scope 2 emissions, while reporting of Scope 3 is optional. As mentioned previously, the organizational boundary change made in 2012 means that leased facilities are not included. The 2018 figures in Table 1 include the emissions reported to TCR, plus the Scope 3 emissions for business air travel and commuting by students, faculty, and staff, so as to match the operational boundaries used for the 1990 and 2008 inventories. In 2018, 85.1 percent of total emissions were associated with three sectors: Buildings and Facilities natural gas (50.8 percent of total), Buildings and Facilities electricity (18.4 percent), and Commute (16.1 percent).

GHG Inventory Forecasts

Consistent with the requirements for a qualified GHG reduction strategy, 2020, 2035 and 2050 forecasts of GHG emissions are based on campus energy-use trends, the anticipated impact of LRDP as amended by proposed developments, the anticipated impact of existing energy efficiency and GHG reduction programs, and compliance and implementation of the policies identified in Section 2 of this document.

Table 2 provides a summary of campus-wide GHG emissions inventories for 1990, 2008, 2015, and 2018 (current), along with the forecasts for 2020, 2035 and 2050. These forecasts are adjusted to incorporate the impact of state-wide measures for reducing transportation-related emissions, namely the Pavley bill (AB 1493), which addresses vehicle fuel efficiency, and the Low Carbon Fuel Standard (LCFS).

The University provides inventories and makes projections in two separate formats. The first is for Market Based Emissions reflecting actual emissions factors from the companies UCSF was able to purchase from in the marketplace. This is the methodology used to report to TCR per the *Sustainable Practices Policy*. The second methodology references generic Western Grid emissions factors for purchased electricity. It is used for comparative purposes as a conservative business-as-usual assessment when looking at multiple similar institutions.

TABLE 2: GHG Emissions History and Forecasts (2020) (values in mt CO_2e)

Market Based emission factors (Actual)			Inventories			Forecast		
Scope	**Emission Category**	1990	2008	2015	2018	2020	2035	2050
1	Building & Facilities - Natural Gas	44,923	90,026	79,889	80,420	83,386	102,528	140,000
1	Building & Facilities - Other Fuels	114	NA	112	197	NA	NA	NA
1	UCSF Fleet	1,944	3,200	2,787	2,714	2432	1359	1,578
1	Refrigerants and Medical Gases	3,500	3,500	1,212	1,656	1254	1550	1,800
1	CCAR Acquision adjustment	10,178	NA	NA	NA	NA	NA	NA
1	Building & Facilities - Electricity	24,529	24,962	29,546	10,776	13,491	NA	NA
	Scopes 1 & 2 Subtotal	85,188	121,688	113,546	95,763	100,563	105,437	143,377
3	Business Air Travel	7,549	12,582	13,385	18,748	14,009	17,257	20,035
3	Commute	17,080	22,069	24,698	25,529	22,167	27,771	32,241
	Scopes 1,2 & 3 Total	109,817	156,339	151,629	140,040	136,739	150,465	195,653
Western Grid Factors (Comparative)			Inventories			Forecast		
Scope	**Emission Category**	1990	2008	2015	2018	2020	2035	2050
1	Building & Facilities - Natural Gas	44,923	90,026	79,889	80,420	85,589	102,528	140,000
1	Building & Facilities - Other Fuels	114	NA	112	197	NA	NA	NA
1	UCSF Fleet	1,944	3,200	2,787	2,714	2432	1359	1,578
1	Refrigerants and Medical Gases	3,500	3,500	1,212	1,656	1254	1550	1,800
1	CCAR Acquision adjustment	10,178	NA	NA	NA	NA	NA	NA
1	Building & Facilities - Electricity	24,529	24,962	29,546	29,108	20,302	NA	NA
	Scopes 1 & 2 Subtotal	85,188	121,688	113,546	114,095	109,577	105,437	143,377
3	Business Air Travel	7,549	12,582	13,385	18,748	14,009	17,257	20,035
3	Commute	17,080	22,069	24,698	25,529	22,167	27,771	32,241
	Scopes 1,2 & 3 Total	109,817	156,339	151,629	158,372	145,753	150,465	195,653

**2018 inventory does not reflect 4,396 mtCo2e of offsets taken by UCSF. This allows equal comparison across years.*

Table 3 provides a summary of the LRDP building growth assumptions used in the GHG emissions forecasting, broken down by the five main campus sites covered by the LRDP. Table 3 has been updated to reflect the acquisition of the new sites that have occurred since the 2014 LRDP and reflects the sale of the Laurel Heights property. Table 3 also includes the projected new growth proposed for the Parnassus Heights campus site under the CPHP.

TABLE 3: UCSF Building Space Forecasts[36]

	Total Gross Square Feet (GSF)			
Campus Site	**2015**	**2020**	**2035**	**2050**
Mission Bay	3,059,700	3,652,500	5,933,900	5,933,900
Parnassus Heights	3,301,800	3,266,900	4,475,200	5,050,600
Mount Zion	776,200	777,100	948,700	948,700
Mission Center Building	290,700	290,800	390,700	390,700
Laurel Heights	362,800	362,800	-	-
Other UCSF Buildings	332,700	1,723,500	1,873,500	1,873,500
TOTAL SPACE	8,123,900	10,073,600	13,622,000	14,197,400

[36] The 2035 GSF estimate includes the Phase 2 Medical Center at Mission Bay

The projected impacts of the state's Renewables Portfolio Standard (RPS) and the UCSF utility funded partnership projects are incorporated into the 2020 and 2035 forecasts for energy-related emissions. Energy data for the past four years were analyzed by the UCSF Energy and Facilities teams to quantify energy use intensities (EUI) for buildings on each of the main campus sites and larger properties, as well as the impact of SEP projects on energy use intensity over the same time period. Table 4 provides a summary of the future energy use intensities forecasted for buildings at each of the campus sites, based on the analysis.

TABLE 4: UCSF Building Energy Use Intensities

	Average energy use intensity in kbtu/ft2				Est % reduction
Campus Site	**2012**	**2020**	**2035**	**2050**	per through 2050
Mission Bay	240.4	213.0	169.8	135.4	1.50%
Parnassus Heights	304.6	269.9	223.5	185.1	1.25%
Mount Zion	314.6	278.8	222.2	177.2	1.50%
MCB Mission Center Building	135.3	119.9	95.6	76.2	1.50%
Laurel Heights	53.2	47.1	NA	NA	1.50%
Other Sites	NA	213.0	169.8	135.4	1.50%

Average annual energy efficiency gains were calculated for each campus area. Because of UCSF's multisite distributed nature in the urban environment, age of existing facilities, and previous investments in cogeneration infrastructure, average energy use intensities vary widely across locations. This EUI information is used to inform the cost benefit analysis of making future investments in reducing emissions.

The 2014 GHG reduction strategy extrapolated planned reductions of EUI's in the future to proposed new buildings to calculate future emissions. This document updates the methodology to reflect the UCOP FOVEA tool for calculating future emissions.

Additional notes on forecasting methodology:

- UCSF Fleet emissions: Forecasts are based on the anticipated growth of student and staff populations by 2020, 2035 and 2050. Updated to reflect the 2019 UC Sustainable Practices Policy and the 2017 acquisition by UCSF of 15 full size electric shuttles buses for the fleet.
- Commute emissions: Forecasts are based on the anticipated growth of student and staff populations by 2020, 2035 and 2050.
- Refrigerants and Medical Gases: Forecasts are based on the anticipated growth of students, staff, patients, and visitors by 2020, 2035 and 2050.
- Solid Waste emissions: Forecasts are based on the anticipated growth of students, staff, patients, and visitors by 2020, 2035 and 2050.
- Adjustments for statewide transportation measures: Combined, AB 1493 (Pavley vehicle efficiency standards) and the LCFS are expected to reduce overall emissions from cars and light-duty trucks by approximately 20 percent by 2030. The adjusted forecasts assume that the entire UCSF fleet will be impacted by Pavley and the LCFS.

- Air travel emissions: Forecasts are based on the LRDP's anticipated growth of student and staff populations by 2020, 2035 and 2050, and then adjusted to account for the expected continuation of fuel efficiency improvements over time. A study by the Federal Aviation Administration (FAA)[37] reports that "Aircraft fuel efficiency has historically improved by about one percent per year. This trend is expected to continue for the foreseeable future."

[37] Federal Aviation Administration (FAA) Office of Environment and Energy, *Aviation & Emissions: A Primer*, 2005. Available at: http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/AEPRIMER.pdf

4 GHG Targets and CEQA Thresholds of Significance

The UCSF *GHG Reduction Strategy* utilizes two approaches to establishing campus-wide GHG emissions targets that are consistent with both UC policy and State policy - AB 32, SB 32, Executive Order B-55-18 as well as other California policy on GHG emissions. Consistency with UC policy for setting emission targets for this plan consists of meeting 1990 levels by 2020; climate neutrality from scope 1 and 2 sources by 2025; and climate neutrality from specific scope 3 sources by 2050 or sooner. Consistency with State policy for setting emission targets for this plan consists of meeting 1990 levels by 2020; 40 percent below 1990 levels by 2030; and 80 percent below 1990 levels by 2050. As an CARB-covered entity, UCSF also has to maintain compliance with CARB's cap and trade program.

As discussed in Section 3 above, one approach to establish a baseline from which to measure targets using UCSF's 1990 emissions inventory (109,817 mt CO2e), while the other is based on UCSF's verified 2008 inventory, using the 15 percent downward adjustment recommended by CARB to account for emissions growth since 1990 (132,888 mt CO2e). Consistent with the policy of reducing emissions, UCSF's goal for the Parnassus Heights campus site is also that future annual unmitigated emissions not exceed its current 2018 emissions of 125,426 MT CO2e.

Table 5 summarizes the projected targets for the amount of emissions that are required to be mitigated as determined by these two methodologies. The actual quantities of emissions that will need to be mitigated each year will be calculated using the TCR annual inventories and the applicable policy in effect at that time. After all of the feasible onsite measures identified in the subsequent section are implemented, offsets will be purchased, as the final action to reach reduction targets, appropriate to the policy to be met, UC or State.

TABLE 5: UCSF Campus-wide GHG Emissions Targets (values in mt CO_2e)

			Based on 1990 Inventory Baseline				
	1990	**2018**	**2020**	**2025**	**2030**	**2035**	**2050**
Emissions (BAU) 1&2	85,188	95,763	100,563	102,186	103,809	105,437	143,377
Emissions (BAU) 1,2 & 3	109,817	125,426	136,739	141,310	145,881	150,465	195,653
AB32 / SB32 goal	109,817	-	109,817	87,854	65,890	54,909	21,963
Balance to mitigate/ offset	-	-	26,922	53,456	79,990	95,557	173,690
UC Policy Goal	109,817	-	109,817	39,124	66,668	45,028	0
Balance to mitigate/ offset	-	-	26,922	102,186	79,213	105,437	195,653
			Based on 2008 Inventory Baseline adjusted 15%				
	2008	**2018**	**2020**	**2025**	**2030**	**2035**	**2050**
Emissions (BAU) 1&2	103,435	95,763	100,563	102,186	103,809	105,437	143,377
Emissions (BAU) 1,2 & 3	132,888	125,426	136,739	141,310	145,881	150,465	195,653
AB32 / SB32 goal	132,888	-	132,888	106,311	79,733	66,444	26,578
Balance to mitigate/ offset	-	-	3,851	34,999	66,148	84,021	169,075

The 2035 and 2050 targets are shown as both the UC Policy goal and the amount needed to offset the full build-out of the LRDP as amended for the CPHP.

5 GHG Reduction Measures

This section describes the GHG reduction measures currently underway at UCSF, as well as those measures that are funded or to which UCSF is currently committed. The GHG reduction measures are organized into two major categories of Energy and Transportation, the areas the University most directly has control.

The *GHG Reduction Strategy* includes two categories of GHG reduction measures: those to which UCSF is currently committed to in terms of existing funding and/or implementation (called "Tier 1" measures); and those that currently committed to in terms of future funding but are in the planning or study stages (called "Tier 2" measures). A combination of Tier 1 and Tier 2 on-site reduction measures are not sufficient for UCSF to meet the future goals. Additional measures – purchasing REC's or offsets – are needed for UCSF to meet the 2025 UC Policy goal of climate neutrality for scope 1 and 2, and, scope 3 by 2050.

Figure 2 below shows the changes in UCSF GHG emissions over time. The grey area indicates historical emissions between 2007 and 2018 based on inventory results. The top line represents business-as-usual; the dotted line the goal. The colored wedges represent the future implementation of various Tier1 and Tier 2 measures described in sections below.

FIGURE 2: UCSF GHG Emissions Reduction Scenario

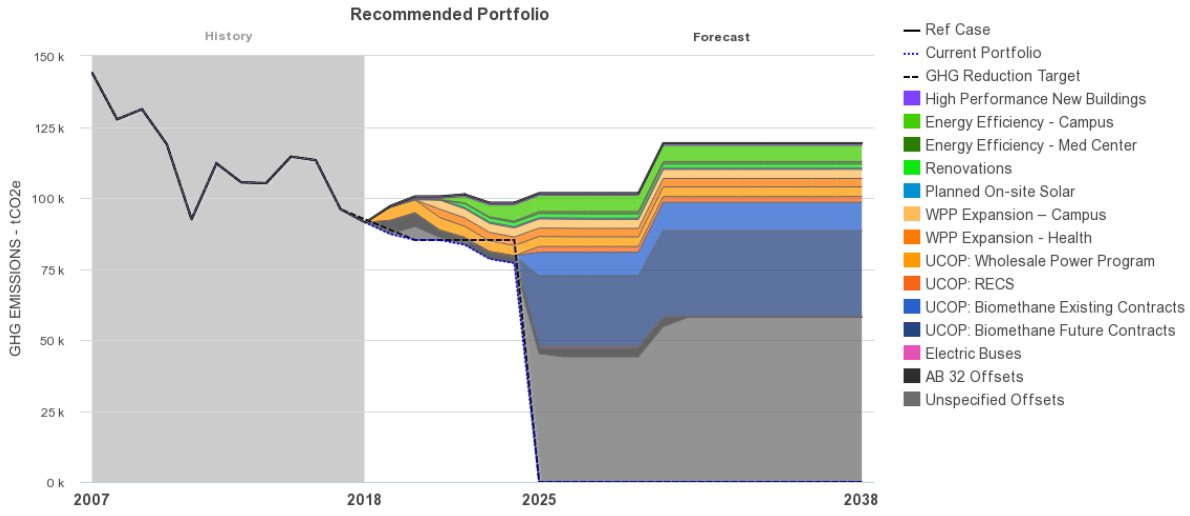


TABLE 6: Emissions Reductions Targets (values in mt CO_2e)

Item	Measure Description	Incremental Emissions Impact MTCO2e / yr
S_01	UCOP: Wholesale Power Program	-3,625
S_02	UCOP: RECS	-2,024
S_03	UCOP: Biomethane Existing Contracts	-9,399
S_04	UCOP: Biomethane Future Contracts	-28,196
S_05	High Performance New Buildings	-762
S_06	AB 32 Offsets	-1,815
S_07	WPP Expansion – Campus	-3,186
S_08	WPP Expansion - Health	-2,978
S_09	Energy Efficiency - Campus	-4,616
S_10	Energy Efficiency - Med Center	-663
S_14	Planned On-site Solar	-422
S_16	Electric Buses	-386
S_17	Renovations	-1,219

5.1 Tier 1 Measures

Table 7 below summarizes the significant Tier 1 strategies (comprised of programs, policies, and actions) that are expected to reduce GHG emissions between now and the planning horizon for the LRDP (2035) and CPHP (2050). Most of the programs and policies associated with these strategies are outlined in the 2009 *Climate Action Plan* and on the UCSF Office of Sustainability's web site. GHG reduction estimates associated with these measures, if not already incorporated into future emissions forecasts (e.g., EN1 – SEP Implementation), are provided for in 2035 and 2050. The following sections provide more detail about the key programs, policies and actions comprising each of the measures.

TABLE 7: UCSF Tier 1 GHG Reduction Measures

Strategy ID	Strategy Name	Annual GHG Reduction by 2020 (MT CO2e)	Annual GHG Reduction by 2035 (MT CO2e)
Energy			
EN1	Improve Energy Efficiency of Existing Buildings and Operations (SEP Implementation)	NA	NA
EN2	Green Building Standards	5,235	10,792
EN3.1	Renewable Energy Strategies: Onsite PV	128	377
EN3.2	Renewable Energy Strategies: Green power purchasing	-	6,721
EN3.3	Renewable Energy Strategies: Biogas purchasing	6,379	6,379
Transportation			
TR1	Reduce Vehicle Trips	1,137	2,561
TR2	Clean Vehicle Strategies	-	-
	Totals:	**12,878**	**26,830**

NOTES:

a - Impact of EN1 is already incorporated into the future GHG emissions forecasts

The following sections describe in more detail the implementing actions associated with each Tier 1 measure, and the GHG reductions expected to result from those actions.

5.2 Energy Measures

Strategy EN1: Improve Energy Efficiency of Existing Buildings and Operations (SEP Implementation)

Key Implementing Actions:

- Continue to revise and implement the SEP to achieve energy efficiency improvements consistent with the results of the past four years.
- Continue to participate in the system-wide UC/CSU Investor Owned Utility Energy Partnership.

Annual GHG reduction: 7,904 mt CO_2e

Implementation Timeframe/Status: In progress; to continue through 2035/2050.

Discussion: UCSF owns or leases space in 189 buildings throughout San Francisco, and energy consumption varies considerably by building use (among other variables, such as building age). For example, research and clinical, or complex space, comprises about 25 percent of UCSF assignable square footage but uses about 70 percent of the total energy consumed. The typical laboratory uses far more energy and water per square foot than the typical office building, due to intensive process and ventilation requirements.

Since the early 1990's UCSF has periodically written Strategic Energy Plans to identify and prioritize implementation of campus investments in energy efficiency projects for existing buildings and infrastructure. These energy efficiency plans, with three-year to seven-year timelines, examine all UCSF facilities for application of new efficiency technologies, implementation of best practices, and available financial incentive programs. Focused primarily on electrical and gas usage, the projects are expected to produce savings equal in value to investment costs within 10 years or less.

As of February 2020, there have been 28 SEP projects completed at UCSF with a total electric savings of 12,264,567 kWh, a total therm savings: 884,784 therms, and an annual utility cost savings: $2,625,108 (using FY1819 utility rates).

There are also 11 active projects SEP Projects with an estimated electric savings of 3,158,254 kWh, an estimated therm Savings of: 101,891 therms, and an estimated utility cost savings: $606,077 (using FY1819 utility rates).

Additionally, there are 48 projects actively under consideration in the planning and evaluation phase. The represent an estimated electric savings of 15,000,000 kWh, and an estimated therm Savings of: 976,000 therms. The current budget plan is for $22,000,000.

The SEP projects undertaken by UCSF over the past 20 years have contributed to a 35 percent reduction of GHGs compared to a business-as-usual scenario.

Utility funded partnership projects cover a wide variety of improvements, from changing lighting fixtures to building new power plants. Lighting and HVAC (Heating, Ventilation, and Air Conditioning) projects are particularly effective tools for achieving reductions. UCSF will continue to convert the remaining existing T12 and 32 watt T8 fluorescent light fixtures to 28 watt T8 lamps or LED's. Other projects include broader use of occupancy sensor controls, daylight harvesting (using daylight to offset the amount of electric lighting needed to properly light a space), and more energy-efficient stairwell fixtures. The replacement of lighting in parking structures is also being evaluated. HVAC improvements in the SEP include meeting basic efficiency standards for air handlers of 10hp and above by: controlling variable air volume with economizers, operating only the hours necessary, providing demand control ventilation where warranted, and controlling static pressure reset to optimize HVAC systems to actual operating conditions.

The SEP includes projects for upgrading laboratory fume hoods with more energy-efficient high-performance models. As explained in the 2009 *Climate Action Plan*, fume hoods use large amounts of energy, and if all of the fume hoods campus-wide[38] were retrofitted and operated to maximize energy efficiency, as much as 4,600 mt CO_2e per year could be avoided.

UCSF is a participant in the system-wide UC/CSU Investor Owned Utility Energy Partnership (the Partnership). The Partnership is designed to help campuses implement energy efficiency programs that decrease their energy use. The Partnership encourages energy-efficient operations and maintenance practices by offering incentives for equipment improvements, and offering training and providing tools to reduce energy consumption and peak demand. Over the past four years, energy efficiency strategies have reduced energy use across UCSF buildings by approximately 17 percent on a per-square-foot basis.

The buildings on the Parnassus campus site comprise the oldest space in the UCSF inventory. The average age of a buildings square foot at Mission Bay is 14 years old, the average age of a buildings square foot at Parnassus is 52 years old. As evidenced in Table 4: UCSF Building Energy Use Intensities, the newer buildings at Mission Bay are significantly less energy intense. Future implementation of SEP, and renewal of the older Parnassus space, is a critical component in the plan to allow UCSF to achieve climate neutrality.

The largest single SEP-type project undertaken by UCSF since 1990 has been the construction of the Parnassus Heights Central Utility Plant (PCUP). The PCUP is 12-MW cogeneration facility constructed between 1995 and 1997; it replaced a far less efficient 50-year-old facility that had significantly higher emissions per MWh. (fuel oil).

The PCUP cogeneration system is a highly efficient generator of energy that uses a single source of clean fuel (natural gas) to produce two energy products, electricity and heat. The heat is used locally for buildings, instead of being discarded as in a conventional electrical generation facility;

[38] Due to an increased awareness of risks associated with exposure to chemicals, and an expanding research program, the number of fume hoods has increased at UCSF from ~400 in 1990, to more than 750 in 2009. The operational energy cost of UCSF's 750 fume hoods is about $4.9 million dollars per year.

the captured heat can be used for either heating or cooling buildings. Further efficiencies are gained by the proximity of the cogeneration plant to the end user, both because transmission losses due to resistance are reduced and because supply can be more quickly matched to demand. Conventional energy production transmits electricity from remote generation sites with low efficiency rates (35 percent); when this is combined with the high efficiency rates (80 percent) of natural gas burned on-site in boilers, UCSF reaches an overall institutional efficiency rate of about 54 percent. In contrast, on-site cogeneration directly employs the thermal energy by-products associated with electricity production, and accompanied with much lower transmission losses, provides an overall institutional efficiency rate of about 76 percent. The UCSF cogeneration plant has 2 turbines. The turbine have undergone upgrades renovation to be more efficient and reduce emissions. UCSF is not proposing increasing the capacity of the turbine equipment in the facility when future upgrades occur to the emissions equipment.

As noted in the preceding section, the GHG-reducing impact of EN1 is already incorporated into the FOVEA future GHG emissions forecasts.

Strategy EN2: Green Building Standards

Key Implementing Actions:

- Exceed Title 24 energy requirements by at least 20 percent (for all new buildings and major renovations except acute care facilities); strive to achieve 30 percent improvement over Title 24. This requirement is maintained over time as Title 24 is revised.
- Pursuant to the UC *Sustainable Practices Policy*, design and build all new buildings (except for laboratory and acute care facilities) to a minimum standard that is equivalent to a LEED® Silver rating. Strive to achieve a standard equivalent to a LEED®-NC Gold rating or higher for all such projects whenever possible, within the constraints of program needs and standard budget parameters.
- Design the UCSF Phase 2 Medical Center at Mission Bay to LEED® Gold standards. (Facilities that are already constructed or are planned or under construction were designed to meet a LEED® Gold standard; future building projects are also expected to meet or exceed this standard.)
- Design the UCSF New Hospital at Parnassus to a minimum of LEED® Gold standards.
- Per the UC *Sustainable Practices Policy*, design all new UCSF laboratory buildings so as to meet Labs21 Environmental Performance Criteria (EPC).

Annual GHG reduction by 2020: 5,235 mt CO_2e
Annual GHG reduction by 2035: 10,792 mt CO_2e

Implementation Timeframe/Status: In progress; to continue through 2035/2050

Discussion: To improve energy efficiency of new buildings, UCSF relies on several available tools, programs and building codes. Title 24 of the California Energy Code enhances the energy efficiency requirements of all newly constructed buildings and major renovations. The 2019 Title 24 update, effective January 1, 2020, improves energy performance of new buildings

significantly, depending on the type of building and its intended use. Major renovations also benefit with respect to energy savings, though to a lesser degree.

The UC *Sustainable Practices Policy* states that the University of California shall incorporate the principles of energy efficiency and sustainability in all capital and renovation projects within budgetary constraints and programmatic requirements. Given the importance of energy efficiency to green building design, the University has set a goal for all new building projects, other than acute care facilities, to outperform the requirements of Title 24 energy-efficiency standards by at least 20 percent.[39]

UCSF is committed already to designing and building all new buildings (except for laboratory and acute care facilities, addressed separately below) so as to meet a minimum standard of sustainability that is equivalent to a LEED-NC Silver rating. In addition, and at the same time, UCSF will continue to strive to achieve a standard equivalent to a LEED-NC Gold rating or higher for such new buildings, whenever possible within the constraints of program needs and standard budget parameters. Over time, this will help achieve the energy savings and GHG emissions reductions associated with EN2, as well as providing the myriad long-term economic, social, and health benefits that accrue to the communities occupying green building spaces, compared with those in conventional buildings.

Central to its academic mission, research laboratories make up a large percentage of the new space developed by UCSF. These types of facilities, filled with specialized equipment, consume significantly more energy per square foot than the average building. Given the importance of specifically addressing sustainability in laboratory facilities, UCSF has also committed to designing all new laboratory buildings to a minimum standard equivalent to a LEED®-NC Silver rating and the Laboratories for the 21st Century (Labs21) Environmental Performance Criteria (EPC), as appropriate. The UCSF design process includes attention to energy efficiency for UCSF buildings that meet LEED® standards for New Construction (listed by standard achieved and year completed):

- Aldea Center on Mount Sutro, 2013 – Gold
- Cardiovascular Research Institute (CVRI), 2012 – Gold
- Dolby Regeneration Medicine, 2011 – Gold
- The Osher Center for Integrative Medicine, 2010 – Silver
- UCSF Medical Center at Mission Bay, 2014 – Gold
- UCSF Mission Hall, 2014 - Silver

UCSF buildings that meet LEED® standards for Existing Buildings Operations and Maintenance:

- Arthur and Toni Rembe Rock Hall (Rock Hall), 2009 – Silver

[39] Although the Title 24 building code does not apply to hospitals, new UCSF medical facilities must be designed to a LEED® Silver standard or higher, which achieves energy savings similar to Title 24. The Medical Center at Mission Bay is being designed to a LEED® Gold standard.

UCSF buildings that meet LEED® standards for Commercial Interiors:

- 1500 Owens Street (leased), third floor clinics, 2012 – Gold
- HSE5 Center for Bioengineering and Tissue Regeneration, 2012 – Gold
- Pharmaceutical Packaging Facility, 2011 – Gold
- HSE 15 S/D Craniofacial & Mesenchymal Biology Lab Renovation, 2010 – Gold
- MSB S1372 Anatomy Department Renovation, 2013 – Silver
- Campus Data Center, 2009 – Silver
- 654 Minnesota Street, 2009 – Certified
- HSW Dentistry Lab, 2005 - Certified

UCSF must ensure that all regulatory obligations are met when the University considers design or operational strategies for reducing GHG emission. Agencies such as the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO), the Occupational Safety and Health Administration (OSHA), and the Institutional Animal Care and Use Committee (IACUC) often have safety protocols in place that constrain UCSF's ability to satisfy GHG reduction goals and simultaneously maintain an acceptable safety margin.

Strategy EN3.1: Renewable Energy: On-Site Solar PV

Key Implementing Actions:

- Build Solar Photovoltaic (PV) energy installation (750 kW) at Mission Bay Hospital; to be operational by 2025.
- Implement Priority 1 Solar PV projects (as determined by UCSF engineer) over the next 20 years.

Annual GHG reduction by 2020: 169 mt CO_2e
Annual GHG reduction by 2035: 864 mt CO_2e

Implementation Timeframe/Status: In progress; to continue through 2035/2050

Discussion: Planned and financed Solar PV installations expected to be operational by 2020 represent approximately 750 kW capacity, capable of displacing 128 mt CO_2e per year using conservative assumptions about PV panel efficiency and electrical productivity in San Francisco. Longer-term, additional solar PV projects deemed Priority 1 because of their financial payback potential are expected to add 1,465 kW for a total capacity of 2,215 kW, displacing approximately 377 mt CO_2e per year by 2035.

UCSF implemented 5 solar photovoltaic projects with over 2 MW capacity in 2018. UCSF now has installed solar panels at 8 owned buildings; UCSF Fresno, Parnassus Dental Clinics, Mission Hall (25A), Third Street Garage, Owens Street Garage, Genentech Hall, Aldea Community Center and Oyster Point. The University is evaluating installing panels at Rutter Center Garage, Mission Bay Hospital, and on surface parking lots. Table 8 details the cost per kWh. The current goal for projects is $0.14 to $0.16/kwh.

TABLE 8: UCSF cost per kWh of installed PPA Solar

		Block 18 & 15 - 1250 KW (dc) system		Block 18 only - 443 KW (dc) system	
Contract Term	**PPA Rate ($/kWh)**	**Total $ savings for entire PPA term (Low)**	**Total $ savings for entire PPA term (High)**	**Total $ savings for entire PPA term (Low)**	**Total $ savings for entire PPA term (High)**
20 vear PPA	$0.160	-$89,000	$693,000	-$32,000	$ 250,000
25 vear PPA	$0.146	$750,000	$2,000,000	$275,000	$ 770,000

Strategy EN3.2: Renewable Energy: Purchasing Green Electricity

Key Implementing Actions:

- Implement UC's Wholesale Electricity Program to increase the supply of low-carbon electricity sources through direct access suppliers;
- Continue, on an on-going basis, to pursue the possibility of increasing purchases of low carbon electrical power from the grid.

Annual GHG reduction by 2035: TBD – potentially 5,784, or, all electricity purchased by 2045

Implementation Timeframe/Status: In progress; to continue through 2035/2050

Discussion: The UC President's goal for UC to become carbon-neutral by 2025 means that UCSF needs to purchase 100% green power by 2024 or purchase additional offsets.
In support of this goal, the UCOP Wholesale Power Program has increased the supply of low-carbon electricity sources through UC's two Fresno-area solar projects as well as shorter term purchases from renewable and carbon-free resources. The ESU supply is carbon neutral as of 2019. Under the Wholesale Power Program, UC is its own registered Energy Service Provider. The Wholesale Power Program serves to stabilize UC's energy costs and provide an opportunity to procure larger proportions of carbon-free energy than would be otherwise available through traditional channels.

The program supplies power to approximately 500 electricity meters across the UC system, with a total 2019 gross load of roughly 261,000 MWh. The peak load ranges from 40 MW in February to 70 MW in September. Annual load has ranged from 260,000 to 305,000 MWh over the past five years of operation. UCSF purchases approximately 20% (44,771MWh) of the WPP resources.

As of 2018, the largest share of UCSF's outside electrical power purchases was from PG&E, one of the cleanest investor-owned large utilities in the country. PG&E is currently forecasting even lower average carbon content for its grid-supplied electricity as it moves towards the SB100 2045 goal of sourcing 100 percent of its electricity from renewable energy and other zero-carbon sources.

The City of San Francisco offers a Community Choice Aggregation program for retail accounts – Clean Power SF. In 2018 its 40% renewable plan was slightly cleaner than PG&E. In January 2018, UCSF switched 77 small bundled non-direct access accounts to Clean Power SF. It is

analyzing the utility bills of new Clean Power SF accounts to identify appropriate candidates for the next phase of accounts to switch over. The University has committed to purchase SFPUC power for the new ZSFG Research and Academic Building currently under construction at that campus site.

UCSF is actively partnering with SFPUC to install infrastructure at Mission Bay under the Bay Corridor Transmission & Distribution (BCTD) program, allowing UCSF the opportunity to purchase 100% renewable Hetch Hetchy hydroelectric power for future projects at that campus site. The BCTD is currently under construction.[40]

This analysis assumes a 100% renewable rate by 2018 and zero carbon by 2020 for the power UCSF purchase from UCOP direct access. UCSF, being located in the City of San Francisco, is a potential customer of carbon free hydropower from the SFPUC. This analysis assumes UCSF can transfer the purchase of 30% of its purchases from PG&E to the SFPUC, however, no firm commitment has been made to date. The University has worked with the SFPUC to bring the infrastructure to Mission Bay Block 34, and is in preliminary discussions with serving the original north campus site with a new 15 kv line. Those decisions are expected in 2020.

This *GHG Reduction Strategy* uses PG&E's 2020 emission factor to forecast 2035 electricity-related GHG emissions (PG&E does not currently provide emission factor forecasts beyond 2020). After 2020, however, it is reasonable to assume that UCSF will continue to lower the average carbon content of its electricity supply due to cleaner electricity from PG&E, or by increasing its small allocation of clean Western Area Power Authority (WAPA) hydropower, or purchasing renewable power through its direct access supplier. The annual GHG reduction estimate for 2035 therefore assumes a significant percent reduction in the carbon content of grid-supplied electricity from 2020 to 2035/2050.

In 2019 CA Senate Bill 237 increased the direct access cap by 4000GWH. [41] The university currently has 55 buildings on direct access using clean power. The majority (52%) at Parnassus Heights. The increase provided for by SB237 provided allows the University to enter a lottery to add additional buildings to direct access.

[40] https://sfwater.org/modules/showdocument.aspx?documentid=14607

[41] https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB237

As a result, about 80 existing UC accounts (representing approximately 75,000 MWh of annual load) will join the WPP beginning in 2021.

TABLE 9: UCSF 2020 Direct Access accounts

SAID	Campus	Service Address		SAID	Campus	Service Address
2593518005	Parnassus	105 BEHR AVE		5996340298	Other	1569 SLOAT BLVD
9041330370	Parnassus	1320 3RD AVE		8835082005	Other	1855 FOLSOM ST
9092958467	Parnassus	1322 3RD AVE		9095507060	Other	1855 FOLSOM ST
3843410005	Parnassus	1326 3RD AVE		9095507030	Other	260 NEWHALL ST
7791330005	Parnassus	1332 3RD AVE		8772609005	Other	3333 CALIFORNIA ST
9095283212	Parnassus	1338 3RD AVE		1608421754	Other	606 FORBES BLVD
9093483363	Parnassus	1344 3RD AVE		1565022959	Other	612 FORBES BLVD
9096508637	Parnassus	1350 3RD AVE		9293662512	Other	620 FORBES BLVD
7499664005	Parnassus	1356 3RD AVE		1523728437	Other	626 FORBES BLVD
9093929796	Parnassus	1362 3RD AVE		1176999780	Other	654 MINNESOTA ST
8957947005	Parnassus	1442 5TH AVE		5855930005	Other	75 CRISP RD
9582770704	Parnassus	1450 3RD ST		5355941005	Mount Zion	1600 DIVISADERO ST
9098614366	Parnassus	1464 5TH AVE		7272605005	Mount Zion	1600 DIVISADERO ST
9874617005	Parnassus	1472 5TH AVE		7230938005	Mount Zion	1600 DIVISADERO ST
2169604659	Parnassus	1480 4TH ST		6855943005	Mount Zion	1600 DIVISADERO ST
1228878005	Parnassus	1480 5TH AVE		6772610005	Mount Zion	1657-75 SCOTT ST
9916283005	Parnassus	1482 5TH AVE		6730943005	Mount Zion	1701 DIVISADERO ST
5501759005	Parnassus	1500 5TH AVE		9095507075	Mount Zion	1725 SCOTT ST
679857784	Parnassus	1550 4TH ST		8710082005	Mount Zion	2200 POST ST
3103739005	Parnassus	165 JOHNSTONE DR		7424351005	Mount Zion	2255 POST ST
604633005	Parnassus	2ND & PARNASSUS NW		8397609005	Mount Zion	2330 POST ST
459139005	Parnassus	4TH & KIRKHAM NW		8647609005	Mount Zion	2340 SUTTER ST
1832989005	Parnassus	66 JOHNSTONE DR		8668415005	Mount Zion	2356 SUTTER ST
6760214005	Parnassus	745 PARNASSUS AVE		1990884306	Mount Zion	2375 POST ST
1791322005	Parnassus	JOHNSTONE DR OPP BEHR		6814276005	Mount Zion	2380 SUTTER ST
3878475005	Parnassus	W/S 4TH AVE 125' N		9903217147	Mount Zion	515 SPRUCE ST
2374656005	Parnassus	175 JOHNSTONE DR				
9095507140	Parnassus	25 MEDICAL CENTER WAY				
9096279728	Parnassus	50 KIRKHAM ST				

Strategy EN3.3: Renewable Energy: Purchasing Biogas and Renewable Energy Credits, Offsets

Key Implementing Actions:

- Purchase biogas for use at PCUP to reduce anthropogenic GHG emissions from the facility, if appropriate sources are available and approved by CARB.[42]

[42] https://ww3.arb.ca.gov/cc/reporting/ghg-rep/guidance/biomass.pdf

and https://ww2.arb.ca.gov/mrr-regulation - Section 95852 of the Cap-and-Trade Regulation

Annual GHG reduction by 2035: 652 mt CO_2e, or more if financially feasible

Implementation Timeframe/Status: The University is currently examining its options in the marketplace. Proposals have been solicited by UCOP, received and evaluated. UCSF continues to evaluate the cost/benefits of bio-gas against other emission reducing options in the marketplace.[43]

Discussion: CO_2 emissions from combustion of biogas are considered biogenic and represent a net-zero addition of GHG emissions to the atmosphere. The FOVEA analysis assumes UCSF purchasing 100,000 therms per month in 2024-2025 for use in the PCUP, which would avoid the production of approximately 652 mt CO_2e per year from combustion of natural gas.

TCR general reporting protocol allows for the use of Renewable Energy Credits (RECs). They represent the energy generated by renewable energy sources, such as solar, hydro, or wind power facilities. RECs represent the clean energy attributes of renewable electricity. RECs reduce Scope 2 emissions for purchased electricity. As of June 2017, RECs representing 8,138 MWh of renewable energy were retired on the University's behalf.

In 2018 UCSF also used 4,396 mt CO_2e of offsets in its emissions reporting with TCR. The offsets retired address Scope 1 emissions associated with natural gas combustion at the PCUP. Offsets can reduce Scope 1, 2, or 3 emissions, though the campus does not plan to use them as a substitute for RECs when RECs are available.

UCSF's practice is to accomplish its sustainability goals through reductions in direct emissions, the purchase of renewable electricity, and other local measures as identified above. Purchase of offsets are the final action to reach reduction targets. As part of UC's Carbon Neutrality Initiative, internal guidelines have been developed to ensure that any use of offsets for this purpose will result in additional, verified GHG emissions reductions from actions that align, as much as possible, with UC's research, teaching, and public service mission.

[43] https://www.ucsusa.org/sites/default/files/attach/2017/05/Promises-and-limits-of-Biomethane-factsheet.pdf

TABLE 10: Renewable energy credits (REC's) retired

UNIVERSITY OF CALIFORNIA

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OFFICE OF THE PRESIDENT
Energy and Sustainability
1111 Broadway Street, Suite 1450
Oakland, California 94607
Phone: (510) 287-3360
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Dear James Hand,

This letter serves to document that Renewable Energy Certificates (RECs) have been retired on behalf of The University of California, San Francisco. The attached Western Electricity Coordinating Council (WECC) report was generated from Western Renewable Energy Generation Information System (WREGIS), Account Holder ID 1020 (The Regents of the University of California). The following table shows the quantity of RECs by Generator Name, WREGIS ID, Nameplate Capacity, Fuel Type, and Period of Generation.

Generator Name	WREGIS ID	Nameplate Capacity (MW)	Fuel Type	Quantity (MWh)	Period of Generation
Lewiston	W1108	0.438	Hydroelectric Water	8	4/1/16-12/31/16
Folsom Unit 1	W1156	66.2	Hydroelectric Water	381	1/1/16-12/31/16
Folsom Unit 2	W1157	66.2	Hydroelectric Water	412	1/1/16-12/31/16
Folsom Unit 3	W1158	66.2	Hydroelectric Water	542	1/1/16-12/31/16
New Melones Unit 1	W1159	150	Hydroelectric Water	250	2/1/16-11/30/16
New Melones Unit 1	W1160	150	Hydroelectric Water	225	3/1/16-12/31/16
Nimbus Plant (2)	W1161	13.4	Hydroelectric Water	149	1/1/16-12/31/16
J.F. Carr Unit 1	W1163	77.2	Hydroelectric Water	159	1/1/16-12/31/16
J.F. Carr Unit 2	W1164	77.2	Hydroelectric Water	139	1/1/16-11/30/16
Keswick Powerplant (3)	W1165	117	Hydroelectric Water	749	1/1/16-12/31/16
O'Neill (3)	W1167	12.6	Hydroelectric Water	20	5/1/16-8/31/16
Shasta Unit 1	W1168	142	Hydroelectric Water	844	1/1/16-12/31/16
Shasta Unit 2	W1169	142	Hydroelectric Water	618	1/1/16-9/30/16
Shasta Unit 3	W1170	142	Hydroelectric Water	793	1/1/16-12/31/16
Shasta Unit 4	W1171	142	Hydroelectric Water	786	1/1/16-12/31/16
Shasta Unit 5	W1172	142	Hydroelectric Water	888	1/1/16-12/31/16
Spring Creek Unit 1	W1173	90	Hydroelectric Water	78	1/1/16-12/31/16
Spring Creek Unit 2	W1174	90	Hydroelectric Water	358	1/1/16-12/31/16
Trinity Unit 1	W1175	70	Hydroelectric Water	210	4/1/16-8/31/16
Trinity Unit 2	W1176	70	Hydroelectric Water	414	1/1/16-12/31/16
Stampede (2)	W1177	3.60	Hydroelectric Water	9	1/1/16-9/30/16
Gianelli (2)	W1288	106	Hydroelectric Water	106	4/1/16-7/31/16
			TOTAL	**8,138**	

This information is provided in accordance with guidance regarding contractual instrument documentation provided in Chapter 14 of The Climate Registry General Reporting Protocol for the Voluntary Reporting Program Version 2.1. To the best of my knowledge, the renewable attributes have not been used to meet any federal, state or local renewable energy requirement, renewable portfolio standard, or other renewable energy mandate.

Cynthia Clark
Renewable Energy Manager
June 21, 2017
Oakland, CA

Attached: WECC Certificates in Retirement Subaccount

5.3 Transportation Measures

Strategy TR1: Reduce Vehicle Trips

Key Implementing Actions:[44]

- As development occurs under the LRDP, increase on-site amenities (such as child care, food services, banking, retail shops, laundry, fitness facilities), and limit parking for on-campus housing and staff.
- Add on-site housing for faculty and students.
- Enhance and expand existing car-share, vanpool, and carpool programs and incentives.
- Encourage departments to allow flexible work schedules and telecommuting.
- Implement LRDP plans to realign supply chain, warehousing, and deliveries so as to streamline all parts of the process and minimize truck trips.

Annual GHG reduction by 2020: incorporated into forecast: 1,137 mt CO_2e
Annual GHG reduction by 2035: incorporated into forecast: 2,561 mt CO_2e

Implementation Timeframe/Status: In progress; to continue through 2035/2050

Discussion: Reductions in UCSF GHG emissions attributable to transportation come from both local institutional actions and from technological and regulatory changes driven by the state and federal government. State and federal government actions to-date have focused on cleaner vehicle technologies, transportation system efficiency improvements, and land use policy. Actions taken by UCSF to address transportation-related GHG emissions have been aimed at reducing vehicle miles traveled (VMT), and include: implementation of various transportation demand management measures, improvements to the campus transportation system, and improving the jobs-to-housing balance. Emissions from transportation are greatly dependent on the length of trips, and the mode of travel used. Generally, bicycle and walking trips produce almost zero carbon emissions, and a trip on public transit produces about half the quantity of GHG emissions as would a comparable trip by private automobile.

As stated in the 2014 LRDP, key features of UCSF's existing TDM program include the following:

- 60 shuttles serving 17 locations, with over 2.5 million passengers per year
  15 full size electric busses, 60 alternate fuel/ hybrid vehicles added to the fleet since 2010.
- 30 vanpools that travel as far as Sacramento and operated using software which improves fuel consumption and safety
- 62 reserved carpool stalls at various sites

[44] Measure assumes implementation of Transportation Demand Management programs, as described in the *Transportation Demand Management Program Improvement Measures Evaluation* report by Fehr & Peers, August 30, 2012.

- 18 City CarShare vehicles with dedicated parking spaces, along with 1,500 UCSF members who can use these vehicles by scheduling their use on-line
- Over 1,900 UCSF users of the ZimRide online carpool matching program
- 972 bicycle parking spaces with another 100 planned at Mission Bay, as well as bike racks on shuttles, a cyclist shower program that allows bicyclists to use UCSF showers at a discount, and other bicycle-related benefits
- Bay Area Bike Share station at Mission Bay and other campus sites, where members have access to bicycles (and a regional network of stations)
- More than 400 off-street motorcycle parking stalls in garages and surface parking lots
- An "emergency ride home" program to encourage use of alternative modes of transportation
- Clipper Card (public transit pass) sales at easily accessible locations, including through UCSF's website
- Close to 1,800 UCSF employees participate in a pretax transit program, which saved UCSF employees over $700,000 on public transit commute costs

UCSF's shuttle system services all primary UCSF campuses, as well as select secondary campus locations, and is free to UCSF faculty, staff, students, patients, and visitors. On average, a total of 7,435 people ride the system daily, with demand for additional service growing by around five percent per year. The 2014 UCSF Shuttle Operations Study estimates a demand for 401 additional trips by 2020, and an additional 3,611 trips by 2035. The study also contains recommendations for expanding service lines to meet increasing demand as development occurs under the 2014 LRDP. New projections for use have been developed for the CPHP EIR.

UCSF faces considerable constraints outside of its control in developing affordable housing. Housing is an auxiliary enterprise of the University, serving as a support service to its primary educational mission; and therefore, by state law, it must be financially self-supporting. Land in San Francisco is extremely expensive to acquire, and UCSF has limitations on new development on vacant land it already owns (such as Aldea San Miguel at Parnassus). UCSF will continue to implement the goals of the 2005 Housing Master Plan to provide more reasonably priced housing for up to 1,400 individuals in targeted groups of the campus community.

Since the completion of the 2014 LRDP UCSF has constructed 610 student housing units south of Mission Bay which opened in late 2019/ early 2020. It also has an existing 70 unit faculty housing building under renovation near Mount Zion.

The CPHP proposes to add 762 new housing units at Parnassus by 2050, with an initial phase project under study to add a portion by 2030.

Strategy TR2: Expand Fleet of Clean Vehicles

Key Implementing Actions:

- Continue to incentivize UCSF departments to purchase fuel efficient vehicles (hybrid, electric, CNG) by waiving the annual permit fee of $1,932.00 per vehicle. This has been

an effective strategy in encouraging departments to purchase fuel-efficient and alternative-fuel vehicles.

- Continue and expand use of low-emitting fuels and vehicles for shuttle system and across UCSF fleet of vehicles.

Annual GHG reduction by 2020: incorporated into forecast: 1 mt CO_2e
Annual GHG reduction by 2035: incorporated into forecast: 1,360 mt CO_2e

Implementation Timeframe/Status: In progress; to continue through 2035/2050

Discussion: In addition to vehicle miles traveled, transportation emissions are dependent on the type of fuel used to power vehicles. UCSF is gradually transitioning its vehicle fleet to alternative fuel vehicles and more fuel efficient vehicles. UCSF currently has 43 low-emitting alternative-fuel and hybrid vehicles, including cars, shuttles, golf carts, and trucks. The UCSF shuttle fleet is currently run mainly on diesel and gasoline; however, the University has purchased 15 full size electric shuttle buses to replace fossil fuel vehicles. An electric vehicle charging station for them was constructed at the Mission Bay campus. UCSF is considering additional electric shuttles for future vehicle replacements.

UCSF has also instituted programs and developed infrastructure to encourage commuters to use a mix of more fuel-efficient and alternative-fuel vehicles. The University offers an employee benefit program to encourage the purchase of EVs (electric vehicles).

The 2015 UCSF Commute Survey[45] indicated that the commuter vehicle fleet is composed of 12.6 percent fuel efficient and alternative fuel vehicles, including hybrid, electric, CNG and biodiesel fueled vehicles. The University has installed 18 electric-vehicle charging stations at Parnassus Heights, Mount Zion, and Mission Bay, and plans to install another 20 at Mission Bay in the Owens Street Garage plus 10 at other locations in the near future. UCSF also has 35 priority parking spaces reserved for fuel-efficient and low-carbon emitting vehicles.

Due to the concerted state effort to improve vehicle fuel efficiency (Pavley bill) and the lack of a current formal "green" or "clean fuel" vehicle replacement program at UCSF, no additional GHG reductions are associated with this measure.

5.4 Tier 2 Measures

As discussed previously and summarized in Figure 1, additional reductions beyond Tier 1 measures (summarized in Table 7) are needed over the planning horizon of the LRDP to meet the 2020, 2025, 2035, and 2050 GHG emission targets. Table 11 lists the Tier 2 measures that UCSF has identified to accomplish the additional reductions needed. The maximum potential reductions for each Tier 2 measure reflect the inventory forecasts for 2020 and 2035, and do not include the reductions expected from Tier 1 measures.

[45] UCSF Transportation Services Annual Commute Survey, UCSF Commute Survey Results 2009-2012.

TABLE 11: UCSF Tier 2 GHG Reduction Measures

Tier 2 Measure	Scope	GHG Inventory Category	Maximum potential reductions by 2020	Maximum potential reductions by 2035
Expand or intensify existing and planned programs for reducing direct emissions associated with stationary sources owned and controlled by UCSF	1	Buildings & Facilities - natural gas	85,589	87,668
Purchase more low-carbon biogas as a replacement for natural gas used by the PCUP	1	Buildings & Facilities - natural gas	85,589	87,668
Expand or intensify existing and planned programs for reducing direct emissions associated with mobile sources owned and controlled by UCSF	1	UCSF Fleet	2,432	2,718
Intensify energy conservation efforts to exceed the reductions of electricity-related emissions currently expected from implementation of the SEP	2	Buildings & Facilities - electricity	20,302	29,205
Purchase a greater percentage of grid-supplied electricity from renewable, low-carbon sources	2	Buildings & Facilities - electricity	20,302	29,205
Invest in renewable energy projects at UCSF or other UC campuses (e.g., where available land exists).	2	Buildings & Facilities - electricity	20,302	29,205
Invest in offsite projects that reduce GHG emissions, preferably within the UC system where the full range of benefits will be retained, to offset emissions in the UCSF emissions inventory.	all	LRDP Construction Emissions	unlimited	unlimited
Purchase accredited carbon offsets that can be used to offset emissions in the UCSF emissions inventory.	all	Buildings & Facilities - electricity	unlimited	unlimited

Tier 2 measures are at various stages in the planning process. Some combination of them, and offsets, will be sufficient to meet the 2020 goals identified in Table 5. Though UCSF is committed to meeting the other targets described in this document, as well as the goals of the UC President's 2025 Carbon Neutrality Initiative, the exact mix of these future actions to be taken by UCSF is dependent on both the results of CARB Scoping Plan Updates, and the recommendations identified in the (future) implementation plan by UCOP of the Presidents 2025 Carbon Neutrality Initiative and the *Sustainable Practices Policy*.

Because the majority of UCSF unmitigated GHG emissions stem from the combustion of natural gas at the PCUP, UCSF annually monitors for the potential to implement the best available control technology for reducing emissions of CO2 at this source. These include retrofitting carbon capture at the facility or using alternative fuel such as low- and zero-carbon hydrogen. Carbon capture uses a combination of technologies to capture the CO2 released by fossil fuel combustion. The latest 2019 UCSF study identified the current cost of carbon capture is 3x+ higher than reducing emissions by purchasing offsets. Carbon capture is an active field of research by UC scientists and many other institutions, future developments in this technology are expected to lower costs and revise the cost benefit analysis. The timeline for this reduction in cost is not clear. The incremental cost of carbon cost varies depending on parameters such as the choice of capture technology, the percentage of CO2 captured, the type of fossil fuel used, and the distance to and type of geologic storage location. Other than the initial capital costs to install the equipment, UCSF is not located adjacent to a geologic storage location.

Approximately 95% of current U.S. hydrogen production involves steam methane reforming (SMR) of natural gas, which releases carbon dioxide as a byproduct. Decarbonizing the production of hydrogen, with electrolysis using zero-carbon electricity from renewables, can generate zero-emission "green hydrogen;" that can be used directly in the existing PCUP to generate electricity with only minor modifications to the existing equipment.[46] Similarly, SMR of natural gas with carbon capture can generate low-emission "blue hydrogen", an environmentally superior product, with significantly lower emissions, when compared to burning natural gas.[47] Other than the initial capital costs to install or modify the equipment, there currently exists an imbalance in the location of UCSF's 2.3 million kwh of installed solar photovoltaic capacity (primarily Mission Bay), and the location where the capacity could be used to generate hydrogen. (Parnassus Heights).

[46] https://www.solarturbines.com/en_US/about-us/news-and-press-releases/converting-high-hydrogen-fuel-to-electricity.html

[47]https://climatecrisis.house.gov/sites/climatecrisis.house.gov/files/Climate%20Crisis%20Action%20Plan.pdf?utm_campaign=GR-2020-07-03-TWiW%20Email%20Short&utm_medium=email&utm_source=Eloqua

6 Implementation and Monitoring

Successful implementation of the measures described in the previous section nearly enable UCSF to achieve the 2020 GHG target. UCSF will need to purchase a small amount of offsets[48] in 2021 to close the gap for that 2020 goal. Deeper reductions provided by the Tier 2 measures; and the purchase of REC's and offsets by UCSF, enable UCSF to achieve the 2025, 2035 LRDP, and 2050 climate neutrality targets.

UCSF staff annually complete a rigorous cost benefit analysis, looking at a wide range of options, striving to get the largest impact in reducing emissions from deploying its financial and operational resources. Despite aggressive efforts towards reducing onsite energy use and increased purchase of renewable power, UCSF expects to still have emissions of about 146,000 mt CO_2e in 2025. In order to reach Carbon Neutrality, UCSF will need to procure additional REC's and offsets in 2025. The appropriate combination of these tools will need to be coordinated with UCOP.

Robust monitoring of campus-wide GHG emissions and the effectiveness of individual programs and policies are ongoing to ensure that UCSF is on track to meeting its other future targets, such as 2050, and to enable UCSF to tier CEQA analysis of future projects from this GHG Reduction Strategy, as described in Section 8.0

UCSF annually quantifies its GHG emissions and reports them to TCR and CARB. The annual verified emissions report for TCR, augmented by estimates of Scope 3 emissions from commuting and air travel will serve as the metric for comparison with both intermediate and 2050 targets.

Staff from the UCSF Office of Sustainability prepare annual reports to UCOP summarizing progress of the implementation of the *GHG Reduction Strategy*. The report evaluates the successes and challenges in implementing the *GHG Reduction Strategy* and evaluate progress toward GHG reduction targets. Staff will provide the status of program implementation (e.g., initiated, ongoing, completed), assess the effectiveness of the strategies and programs included in the Plan against the established objectives, and recommend adjustments to programs or tactics as needed. The annual report will also assess whether UCSF's actual growth and development is consistent with the forecasts made in the LRDP. If necessary, UCSF shall modify the geographic scope of the inventory and emissions targets accordingly.

An update of the *GHG Reduction Strategy* should occur at least every five years to ensure the strategy remains effective in reducing GHG emissions to the extent needed for achieving the 2025, 2035 and 2050 targets. In addition, the following situations occurring over the LRDP planning horizon will necessitate a revision to the *GHG Reduction Strategy*:

- A change in regulations affecting GHG targets or thresholds. The state is likely to legislate more new GHG reduction goal for post-2020. Currently, the *GHG Reduction Strategy* can only anticipate what that goal will be based on the current regulations. The BAAQMD may also develop new guidelines for CEQA as the state regulations are developed.
- A proposed new project that exceeds the total new square footage (summarized in Table 3)

[48] Actual number will not be known until calendar year 2020 is complete and verified by TCR. Due to pandemic, current estimate is for about 10,000 -15,000 mtCO2e.

- A change in the mix of proposed new project types (e.g., another new hospital beyond that envisioned for Mission Bay and Parnassus Heights) that would result in significantly higher energy use intensities than predicted and summarized in Table 4.
- An operational change at UCSF that results in a significant change in projected GHG emissions. UCSF may institute new policies or programs, or abandon current or planned programs, and by doing so, affect GHG emissions. The States regulation of UCSF ability to enter into long-term contracts to purchase a large amount of zero-carbon electricity is one example of such a possible change.
- The required monitoring of the *GHG Reduction Strategy* reveals that UCSF's GHG reduction programs are not reducing emissions adequately to meet its targets.

7 CEQA Project Review

Under CEQA, the effects of GHG emissions are considered a potentially significant environmental impact. In addressing climate change, CEQA provides a useful mechanism for local agencies to evaluate new development on a comprehensive basis rather than on an individual project basis. The CEQA Guidelines recognize this, and include a provision for streamlining the analysis of projects that are consistent with a more comprehensive plan for the reduction of GHG emissions (CEQA Guidelines, Section 15183.5). This *GHG Reduction Strategy* meets an important requirement of CEQA Guidelines Section 15183.5(b)(1) as a plan that analyzes cumulative GHG impacts. The GHG Reduction Plan uses established protocols, methodologies and forecasts of existing and future land uses to quantify existing and projected future GHG emissions within the plan area. It also establishes a reduction target based on California State law (AB 32, AB 32, SB 32, and Executive Order B-55-18), and lays out policies, actions, and performance standards that UCSF will enact and implement over time to reduce emissions. However, as demonstrated in this document, the current *GHG Reduction Strategy* does provide the emissions reductions needed to achieve the reduction targets identified in the UC Sustainable Practices Policy and in the state-mandated reduction target embodied in AB 32, SB 32, and EO B-55-18.

By implementing the Tier 1 measures along with a mix of the Tier 2 measures identified in Section 5.3, and purchasing offsets, UCSF will close the gap to meet the state law derived emissions target for 2020 and beyond, allowing it to utilize the CEQA streamlining provision in CEQA Guidelines Section 15183.5(b)(1). A future development project would be considered consistent with the revised *GHG Reduction Strategy* if it were consistent with the *GHG Reduction Strategy* assumptions regarding the amount and type of future development, and was consistent with the GHG reduction measures included in the revised *GHG Reduction Strategy*. Projects consistent with the revised *GHG Reduction Strategy*, including conformance with any performance measures applicable to the project, would not require additional GHG emissions analysis under CEQA Guidelines Sections 15064(h) and 15183.5(b)(2).[49]

7.1 Screening Project for Consistency with the GHG Reduction Strategy

In order to assist with determining project consistency with the *GHG Reduction Strategy*, a project consistency checklist is included in Table 12. This checklist is intended to provide the opportunity for individual projects to demonstrate that they are minimizing GHG emissions, while ensuring that new development at UCSF will achieve its 'fair share' of emissions reductions. The *GHG Reduction Strategy* stipulates a range of prescribed and planned GHG reductions measures for meeting the GHG reduction target. The project review checklist would screen projects for important GHG reduction measures that, when implemented, will provide confidence that the project will not impede UCSF's ability to meet its GHG emissions targets. This checklist may evolve over time as the mix of Tier 2 reduction measures is better defined and implemented.

[49] If there is substantial evidence that the effects of a particular project may be cumulatively considerable, notwithstanding the project's compliance with the qualified GHG Reduction Strategy, CEQA requires that an EIR be prepared.

For the project checklist to be valid, UCSF would need to ensure that total development does not exceed the following growth assumptions used to develop the emissions forecasts in this *GHG Reduction Strategy*.

TABLE 12: Growth assumptions

2050 total building space = 14,197,000 gross square feet (gsf), with campus specific growth limits provided in Table 3
2050 population of students + staff = 31,200
2050 population of students + staff + patients + visitors 45,400

Appendix HIA
Additional Information Regarding Potential Health Effects of Criteria Air Pollutant Emission Impacts

Prepared for
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San Francisco, California

Prepared by
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Project Number
1690017005

Date
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UCSF COMPREHENSIVE PARNASSUS HEIGHTS PLAN

ADDITIONAL INFORMATION REGARDING POTENTIAL HEALTH EFFECTS OF CRITERIA AIR POLLUTANT EMISSION IMPACTS

PARNASSUS HEIGHTS

SAN FRANCISCO, CALIFORNIA

RAMBOLL

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ATTACHMENTS

Attachment A: Emissions Inventory, Spatial Allocation, and SMOKE Setup

Attachment B: PGM Inputs, Outputs, and Assumptions

Attachment C: BenMAP and Health Effects

1. INTRODUCTION

This report presents an estimate of the potential health effects of the emissions of criteria pollutants that may result from the adoption and implementation of UCSF's Comprehensive Parnassus Heights Plan (CPHP) in San Francisco, California (referred to hereafter as "the Proposed Project" or "Project").

1.1 Friant Ranch Decision

As background for this evaluation, Environmental Impact Reports (EIRs) prepared pursuant to the California Environmental Quality Act (CEQA) have long evaluated project-related health effects of toxic air contaminants, such as diesel particulate matter (PM), through quantitative and/or qualitative means relative to air district-issued thresholds of significance. However, EIRs historically have not evaluated the specific health effects of project-related increases in criteria pollutants,[1] other than to note and summarize scientific literature regarding the general effect of those pollutants on health. Instead, in accordance with air district-issued thresholds of significance and industry standard practice at the time, CEQA analysis historically and traditionally focused on estimating project-related mass emissions totals for criteria pollutants and, in certain cases, conducting dispersion modeling to assess impacts on local ambient air quality concentrations.

In this report, Ramboll presents one method that correlates project-related mass emissions totals for criteria pollutants to estimated health-based consequences. More specifically, in order to estimate the health effects of the increases of criteria pollutants for the proposed Project, Ramboll applied a photochemical grid model (PGM) and Comprehensive Air Quality Model with extensions (CAMx) to estimate the increases in concentrations of ozone and $PM_{2.5}$ in the region as a result of the emissions of criteria and precursor pollutants from the Project. We then applied a U.S. Environmental Protection Agency (USEPA)-authored program, the Benefits Mapping and Analysis Program Community Edition (BenMAP-CE, herein referred to as "BenMAP"),[2] to estimate the resulting health effects from the small increases in concentration. Only the health effects of ozone and $PM_{2.5}$ are estimated, as those are the pollutants that USEPA uses in BenMAP to estimate the health effects of emissions of NOx, VOCs, CO, SO_2, and $PM_{2.5}$. Ozone and $PM_{2.5}$ have the most critical health effects and thus are the emissions evaluated to determine the Project's health effects.

1.2 Additional Evaluation

This analysis estimates the health effects of criteria pollutants and their precursors, specifically those that are evaluated by the USEPA in rulemaking setting the national ambient air quality standards: NOx, VOC [also known as reactive organic gases, or ROG, which are virtually the same as VOC with some slight differences],[3] CO, ozone, SO_2, and $PM_{2.5}$.

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[1] Criteria pollutants are those pollutants with an air pollution standard or pollutants which are precursors to those with a standard. Pollutants with an air pollution standard include nitrogen dioxide, sulfur dioxide, ozone, carbon monoxide, particulate matter smaller than 2.5 microns in diameter and 10 microns in diameter ($PM_{2.5}$ and PM_{10}), and ozone. Precursor pollutants to criteria pollutants include oxides of nitrogen (NOx), oxides of sulfur (SOx), carbon monoxide (CO), and volatile organic compounds (VOCs).

[2] https://www.epa.gov/benmap/benmap-ce-manual-and-appendices.

[3] Reactive organic gas (ROG) emissions are quantified and modeled as VOCs in this assessment. ROG means total organic gases minus ARB's "exempt" compounds (e.g., methane, ethane, CFCs, etc.). ROG is similar, but not identical, to USEPA's term "VOC", which is based on USEPA's exempt list, which is slightly different from ARB's list.

Consistent with USEPA's assessment of health effects of PM, our health effects evaluation focuses on $PM_{2.5}$ and not PM_{10}[4] as $PM_{2.5}$ has a much larger body of evidence that this size fraction is associated with health effects due to the sources, composition, chemical properties and lifetime in the atmosphere (USEPA 2009). $PM_{2.5}$ is capable of penetrating deeper into the lungs because of their size compared to larger particles and this is believed to contribute to greater health effects. Consistent with USEPA health effects evaluations, the health effect functions in BenMAP for PM use fine particulate ($PM_{2.5}$) as the causal PM agent. NOx and VOCs are not criteria air pollutants but, in the presence of sunlight, they form ozone and contribute to the formation of secondary $PM_{2.5}$ and thus are analyzed here. As a conservative measure, SO_2 and CO are evaluated due to their small contribution to the formation of secondary $PM_{2.5}$ and ozone. The health effects from ozone and $PM_{2.5}$ are examined for this Project because the USEPA has determined that these criteria pollutants would have the greatest effect on human health. The emissions of other criteria pollutants and precursors, including VOC, NOx, CO, and SO_2, are analyzed in their contribution in the formation of ozone and secondary $PM_{2.5}$.

The evaluation presented herein serves to describe the potential health effects of the criteria pollutant emissions associated with the Project. This evaluation does not make a new significance determination.

[4] PM_{10} is defined as particulate matter with a nominal mean aerodynamic diameter less than or equal to 10 µm.

2. TECHNICAL APPROACH

The USEPA's air quality modeling guidelines (Appendix W[5]) and ozone and $PM_{2.5}$ modeling guidance[6] recommend using a PGM to estimate ozone and secondary $PM_{2.5}$ concentrations. The USEPA's modeling guidance does not recommend specific PGMs but provides procedures for determining an appropriate PGM on a case-by-case basis. Both the modeling guidelines and guidance note that the CAMx[7] and the Community Multiscale Air Quality (CMAQ[8]) PGMs have been used extensively in the past and would be acceptable PGMs. As such, the USEPA has prepared a memorandum[9] documenting the suitability for using CAMx and CMAQ for ozone and secondary $PM_{2.5}$ modeling of single-sources or group of sources.

The first step in the process is to run the PGM with appropriate information to assess the increases in ambient air concentrations that the Project emissions may cause. PGMs require a database of information, including the spatial allocation of emissions, in the area to be modeled. This includes both base (background/existing) emissions and Project emissions. The latest publicly available PGM database for Northern California was developed by the Bay Area Air Quality Management District (BAAQMD) in support of the 2000 Central California Ozone Study (CCOS),[10] and was adapted for this analysis. The model domain used is discussed further in Attachment B and encompasses an area of 740 kilometers (km) by 740 km centered around the Central Valley of California. The computational domain roughly extends from Shasta and Trinity counties at the north, to the northern portion of Los Angeles county to the south. The domain includes regions of the Pacific Ocean on its western portion and parts of Nevada on its eastern portion. This PGM database is tailored for Northern California using California-specific input tools (e.g., the EMission FACtors (EMFAC)[11] mobile source emissions model) and uses a high-resolution 4-km horizontal grid to better simulate meteorology and air quality in the complex terrain and coastal environment of California. Project emissions included NO_X, CO, SO_2, respirable (PM_{10}) and fine ($PM_{2.5}$) primary PM, and VOCs. As discussed above, NO_X and VOC are precursors to ozone and, along with SO_2, are also precursors to secondarily formed $PM_{2.5}$. CO also plays a smaller role in the formation of ozone and is thus conservatively evaluated here.

To estimate the potential outcome of the proposed Project's emissions on ambient air concentrations, the Project's annual emissions were added to the CAMx 4-km annual PGM modeling database.[12] Operational emissions from the Project were estimated as described in Draft EIR Section 4.2 Air Quality, and in Attachment A.[13] Incremental operational emissions

[5] https://www3.epa.gov/ttn/scram/appendix_w/2016/AppendixW_2017.pdf.

[6] https://www3.epa.gov/ttn/scram/guidance/guide/O3-PM-RH-Modeling_Guidance-2018.pdf.

[7] http://www.camx.com/.

[8] https://www.epa.gov/cmaq.

[9] https://www3.epa.gov/ttn/scram/guidance/clarification/20170804-Photochemical_Grid_Model_Clarification_Memo.pdf.

[10] http://www.baaqmd.gov/about-air-quality/research-and-data/research-and-modeling.

[11] https://www.arb.ca.gov/emfac/.

[12] BAAQMD performed WRF meteorological modeling for the CCOS 4-km domain and 2012 calendar year that has been processed by WRFCAMx to generate CAMx 2012 4-km meteorological inputs for the CCOS domain. The CMAQ 2012 emissions have been converted to the format used by CAMx using the CMAQ2CAMx processor.

[13] To the extent that conservative inputs were used to estimate Project-related criteria pollutants and precursors, the analysis provided herein also is conservatively influenced by those inputs.

for year 2050, representing full buildout, were modeled so as to represent a potential worst-case year of impacts.[14] Potential impacts from the Initial Phase Projects, including Irving Street Arrival, Research and Academic Building, and initial Aldea housing densification, are qualitatively discussed in the results section below, as are potential impacts from construction of the Initial Phase Projects, including construction of the New Hospital.

For use in PGMs, each Project emissions source must be spatially distributed across the modeling grid cells so that they can be incorporated into the gridded emission inventory. The unmitigated incremental emission inventory for the Project at full buildout (year 2050) was used in the analysis. This includes architectural coatings, VOCs in consumer products, natural gas combustion, landscaping equipment, emergency generators, central utility plant (CUP), and emissions associated with motor vehicle use. The emissions from architectural coatings, consumer products, natural gas combustion, landscaping equipment, emergency generators, and CUP are located onsite, and were therefore allocated to the grid cells representing the Project site. The mobile source category includes both passenger vehicles and trucks which are spatially distributed in both the Project site's grid cells, as well as the offsite grid cells along primary travel routes. Annual emission estimates from the Project were spatially gridded, temporally allocated, and chemically speciated to be used for photochemical grid modelling using the Sparse Matrix Operator Kerner Emissions (SMOKE) emissions modelling system supported by the USEPA. The emissions inventory, spatial allocation, and SMOKE inputs and outputs are shown in Attachment A.

As discussed above, the Northern California 2000 CCOS modeling database was used for this Project. The Northern California 4-km PGM modeling database is based on a 2012 base meteorological year. The 2050 future year projections were used for this analysis, as described in Attachment A. The Project's emissions were isolated by the source apportionment tools in CAMx to obtain the incremental ozone and $PM_{2.5}$ concentration changes due to the Project's emissions. More details and inputs for the PGM modeling are included in Attachment B.

Following completion of the CAMx source apportionment modeling, Ramboll used the USEPA's BenMAP[15, 16] program to estimate the potential health effects of the Project's contribution to ozone and $PM_{2.5}$ concentrations. BenMAP uses the concentration estimates produced by CAMx, along with population and health effect concentration-response (C-R) functions, to estimate various health effects of the concentration increases. BenMAP has a wide history of applications by the USEPA and others, including for local-scale analysis[17] as needed for assessing the health effects of a project's emissions. We used the BenMAP health effects C-R functions that are typically used in national rulemaking, such as the health effects assessment[18] for the 2012 $PM_{2.5}$ National Ambient Air Quality Standard (NAAQS). The health endpoints used for $PM_{2.5}$ include mortality (all causes), hospital admissions (respiratory, asthma, cardiovascular), emergency room visits (asthma), and acute myocardial infarction (non-fatal). For ozone, the endpoints are mortality, emergency room

[14] Incremental average daily operational emissions in 2050 are higher than incremental average daily operational emissions from the Initial Phase Projects in year 2030, and higher than any maximum daily construction emissions from the Initial Phase Projects, and thus are considered the potential worst-case year of impacts.

[15] https://www.epa.gov/benmap/how-benmap-ce-estimates-health-and-economic-effects-air-pollution.

[16] https://www.epa.gov/sites/production/files/2015-04/documents/benmap-ce_user_manual_march_2015.pdf.

[17] https://www.epa.gov/benmap/benmap-ce-applications-articles-and-presentations#local.

[18] https://www3.epa.gov/ttn/naaqs/standards/pm/data/PM_RA_FINAL_June_2010.pdf.

visits (respiratory) and hospital admissions (respiratory). Details on the BenMAP inputs and outputs and definitions for the health effects are shown in Attachment C.

3. RESULTS

This section presents the results of the health effects analysis for the incremental increases in $PM_{2.5}$ and ozone resulting from primary and precursor emissions for these constituents. The results presented here describe the potential health effects of the criteria pollutant emissions associated with the Project, and the results themselves do not constitute a new significance determination.

There are a number of conservative assumptions built into this evaluation, beginning with the quantification of emissions themselves. These conservative assumptions include, but are not limited to, the following:

- Unmitigated emissions were conservatively modeled. Incorporation of reductions due to mitigation measures would result in lower health effect estimates;
- CPHP Mitigation Measures AIR-2a and 2b would require the implementation of additional TDM and other measures to reduce vehicle trips to the campus site. However, the reduction in PM_{10} and $PM_{2.5}$ emissions that would be achieved from the implementation of these measures cannot be reasonably estimated. Therefore, the results conservatively do not reflect vehicle miles traveled (VMT) reductions from these additional transportation demand management (TDM) measures;
- Assumption that health effects occur at any concentration, including small incremental concentrations (discussed further in Attachment C); and
- Assumption that all $PM_{2.5}$ is of equal toxicity (discussed further in Attachment C).

As such, results presented below are meant to represent an upper bound of potential health effects, and actual effects may be zero. For example, should health effects in fact only occur above a certain threshold, and the increment from the Project not cause an exceedance of that threshold, actual health effects could in fact be zero.

3.1 Potential Health Effects Associated with the Project

Overall, the estimated change in health effects from ozone and $PM_{2.5}$ associated with the Project's additional emissions are minimal relative to background incidences. Tables 3-1 and 3-2 below show the annual percent of background health incidence for $PM_{2.5}$ and Ozone health effects associated with the Project. The "background health incidence" is an estimate of the average number of people that suffer from some adverse health effect in a given population over a given period of time, in the absence of additional emissions from the Project. Health incidence rates and other health data are typically collected by the government as well as the World Health Organization. Background health incident rates presented in this report are over the full model domain, as defined in Attachment B, which has a projected population of 24,961,329 in 2050. Project-related health incidences occur both in closer proximity to Project emissions, particularly for $PM_{2.5}$ health effects (see Attachment B for maps of modeled concentration changes), or over a large area due to the regional nature of emission dispersion and photochemical reactions that occur, particularly for ozone health effects (concentration changes also shown in Attachment B). When taken into context, the small increase in incidences and the small percent of the number of background incidences indicate that these health effects are minimal in a developed environment.

Table 3-1. BenMAP-Estimated Annual Mean $PM_{2.5}$ Health Effects of the Project Emissions Across the Northern California Model Domain [1]

Health Endpoint[2]	Project Mean as Percent of Background Health Incidence (%) (Annual)	Background Health Incidence (Annual)
Emergency Room Visits, Asthma [0-99]	0.00078%	126,657
Mortality, All Cause [30-99]	0.00072%	327,475
Hospital Admissions, Asthma [0-64]	0.00049%	14,603
Hospital Admissions, All Cardiovascular (less Myocardial Infarctions) [65-99]	0.00011%	180,325
Hospital Admissions, All Respiratory [65-99]	0.00027%	155,122
Acute Myocardial Infarction, Nonfatal [18-24]	0.00030%	32
Acute Myocardial Infarction, Nonfatal [25-44]	0.00039%	1,657
Acute Myocardial Infarction, Nonfatal [45-54]	0.00036%	4,260
Acute Myocardial Infarction, Nonfatal [55-64]	0.00034%	8,464
Acute Myocardial Infarction, Nonfatal [65-99]	0.00032%	33,946

[1] Health effects are shown terms of incidences of each health endpoint and how it compares to the base values (2050 base year health effect incidences or "background health incidence"). Health effects and background health incidences are across the Northern California model domain.
[2] Affected age ranges are shown in square brackets.

Annual mean $PM_{2.5}$-related health effects attributed to Project-related increases in ambient air concentrations included asthma-related emergency room visits (0.99 incidences per year), asthma-related hospital admissions (0.07 incidences per year), all cardiovascular-related hospital admissions (not including myocardial infarctions) (0.20 incidences per year), all respiratory-related hospital admissions (0.42 incidences per year), mortality (2.36 incidences per year), and nonfatal acute myocardial infarction (0.16 incidences per year across all age groups).

Table 3-2. BenMAP-Estimated Annual Mean Ozone Health Effects of the Project Emissions Across the Northern California Model Domain[1]

Health Endpoint[2]	Project Mean as Percent of Background Health Incidence (%) (Annual)	Background Health Incidence (Annual)
Hospital Admissions, All Respiratory [65-99]	0.000066%	155,122
Mortality, Non-Accidental [0-99]	0.000027%	204,688
Emergency Room Visits, Asthma [0-17]	0.0011%	41,194
Emergency Room Visits, Asthma [18-99]	0.00089%	85,464

[1] Health effects are shown terms of incidences of each health endpoint and how it compares to the base values (2050 base year health effect incidences, or "background health incidence"). Health effects and background health incidences are across the Northern California model domain.
[2] Affected age ranges are shown in square brackets.

Annual mean ozone-related health effects attributed to Project-related increases in ambient air concentrations included respiratory-related hospital admissions (0.10 incidences per year), mortality (0.055 incidences per year), and asthma-related emergency room visits (0.47 incidences for ages 0-17 and 0.76 incidences for ages 18-99).

The health effects from ozone and $PM_{2.5}$ are minimal in light of background incidences. We did not quantify the potential health effects from other criteria air pollutants, consistent with how USEPA quantifies the health impacts and economic costs for criteria air pollutants (other than ozone and $PM_{2.5}$). Specifically, USEPA relies on studies that evaluate the health effects of $PM_{2.5}$ as a surrogate for general PM effects (including PM_{10}) in health effect assessments (e.g., USEPA, 2012). In addition, for NO_2, USEPA has noted that uncertainty remains regarding the independent effects of NO_2 from other air pollutants, including ozone and $PM_{2.5}$ (USEPA, 2016). Additionally, in 2017, USEPA concluded that a quantitative risk assessment was not supported for NO_2, stating that there were significant limitations in the available epidemiological studies including "the potential for co-pollutant confounding of the NO_2 association, potential bias due to exposure measurement error, and the shape of the concentration-response function." (USEPA, 2017)

3.2 Potential Health Effects Associated with Operation of the Initial Phase Projects [Irving Street Arrival, Research and Academic Building, and Initial Aldea Housing Densification]

Incremental operational emissions associated with the Initial Phase Projects were estimated for the year of buildout (2030) in the EIR. Initial Phase Projects include Irving Street Arrival, Research and Academic Building, and initial Aldea housing densification and do not include the New Hospital. Emissions associated with these projects include emissions from architectural coatings, VOCs in consumer products, landscaping equipment, emergency

generators, CUP, and emissions associated with motor vehicle use. Details of these emissions are shown in Attachment A.

The potential health effects from the emissions associated with the Initial Phase Projects can be generally characterized using the full Project level modeling results and a comparison of total emissions. This is because the types and general spatial allocation of emissions is similar between the Initial Phase Projects and the full Project buildout. Emissions from the Initial Phase Projects would also be subject to similar meteorological and photochemical reaction conditions as the full Project assessment. Additionally, the exposed population at full buildout in 2050 is greater than the exposed population in 2030, due to project growth in the region. Therefore, linearly scaling full Project buildout health effects to estimate Initial Phase Projects health effects is conservative.

Concentrations changes, and thus health effects, from $PM_{2.5}$ are driven by primary $PM_{2.5}$ emissions (see Attachment B), with smaller contributions from NOx, VOC, and SO_2 resulting in secondary $PM_{2.5}$ formation. Based on a ratio of total $PM_{2.5}$ emissions from the full Project to Initial Phase Projects $PM_{2.5}$ emissions, approximate health effect results from $PM_{2.5}$ for the Initial Phase Projects would be approximately 80% lower than those from the full Project buildout.

Concentration changes, and thus health effects, from ozone are driven primarily by emissions of VOC and NOx, with some contribution from CO. Based on a ratio of total VOC and NOx emissions from the full Project to Initial Phase Projects VOC and NOx emissions, approximate health effect results from ozone for the Initial Phase Projects would be approximately 80% lower than those from the full Project buildout.

3.3 Potential Health Effects Associated with Construction [Initial Phase Projects and the New Hospital]

Construction emissions were quantified both for the Initial Phase Projects (Irving Street Arrival, Research and Academic Building, and initial Aldea housing densification) and the New Hospital for years 2022 through 2029. Details of phasing and sequencing in 2030 and beyond are not yet available and thus emissions, including potential overlapping construction and operational emissions, cannot be accurately quantified beyond that year. Details of these emissions are provided in Attachment A. As shown there, maximum daily emissions associated with construction activity are a fraction of incremental 2050 emissions evaluated under the full Project buildout, and thus any potential health effects resulting from such construction activity would be less than what has been modeled for the full Project buildout.

3.4 Uncertainty

Analyses that evaluate the changes in concentrations resulting from individual sources and the health impacts of increases or decreases in pollutants as a result of regulation on a localized basis are routinely done. This analysis does not tie the changes in concentration to a specific health effect in an individual; however, it does use scientific correlations of certain types of health effects from pollution to estimate effects on the population at large.

There is a degree of uncertainty in these results from a combination of the uncertainty in the emissions themselves, the change in concentration resulting from the PGM, and the uncertainty of the application of the C-R functions. All simulations of physical processes, whether ambient air concentrations or health effects from air pollution, have a level of uncertainty associated with them due to simplifying assumptions. The overall uncertainty is a combination of the uncertainty associated with each piece of the modeling study, in this

case, the emissions quantification, the emissions model, the PGM, and BenMAP. While these results reflect a level of uncertainty, regulatory agencies, including the USEPA have judged that, even with the uncertainty, they provide sufficient information to the public to allow them to understand the potential health effects of increases or decreases in air pollution.

3.4.1 PGM Uncertainty

PGMs generally represent the state-of-the-science when the treatment of photochemically formed air pollution is required over multiple spatial scales (e.g., from single-source to continental). PGMs are part of a modeling system in which there are several other major components that determine model performance, including meteorology, emissions inventories (including background), and chemical mechanisms, all of which have associated uncertainties, as discussed further in Attachment B.

Despite these complexities and associated uncertainties, the USEPA recommends using PGMs for a variety of applications including State Implementation Plans and Regional Haze Planning, and CAMx or CMAQ specifically for single-source modeling of ozone and secondary $PM_{2.5}$. The USEPA believes that the relative change in the PGM-predicted concentrations (e.g., the incremental changes due to the emissions from a single-source) is more accurate and reliable than the total predicted concentrations (USEPA, 2018).

3.4.2 C-R Function Uncertainty

The approach and methodology of this analysis ensures that the uncertainty is of a conservative nature. In addition to the conservative assumptions built into the emissions noted above, there are a number of assumptions built into the application of C-R functions in BenMAP that may lead to an overestimation of health effects. For example, for all-cause mortality impacts from $PM_{2.5}$, these estimates are based on a single epidemiological study that found an association between $PM_{2.5}$ concentrations and mortality. While similar studies suggest that such an association exists, there remains uncertainty regarding a clear causal link. The USEPA has also stated that results from various studies have shown the importance of considering particle size, composition, and particle source in determining the health effects of PM (USEPA, 2009). Further, the USEPA (2009) found that studies have reported that particles from industrial sources and from coal combustion appear to be the most significant contributors to PM-related mortality, consistent with the findings by Rohr and Wyzga (2012) and others. This is particularly important to note here, as the majority of PM emissions generated from the Project are from brakewear, tirewear, and entrained roadway dust (see Attachment A), and not from combustion. Therefore, by not considering the relative toxicity of PM components, the results presented here are conservative.

For both the $PM_{2.5}$ and ozone health effects calculated, each of the pollutants may be a confounder of the other. That is, in studies that only evaluate health effects from $PM_{2.5}$ exposures, the observed health effects could actually be partly due to ozone, but are attributed fully to $PM_{2.5}$, yielding a higher effect estimate for $PM_{2.5}$. Thus, because C-R functions are from studies that evaluated the effects for each pollutant individually, but both air pollutants could actually contribute to the health effect outcomes evaluated, the overall impacts from each pollutant may be overstated.

Another uncertainty highlighted by the USEPA (2012) which applies to potential health effects from both $PM_{2.5}$ and ozone, is the assumption of a log-linear response between exposure and health effects, without consideration for a threshold concentration below which effects may not be measurable. Without consideration of a threshold concentration, any

changes in air pollution are assumed to adversely affect health. The health effects estimation using this method presumes that effects seen at large concentration differences can be linearly scaled down to small concentration differences, with no consideration of potential threshold concentrations, below which health effects may not occur. In summary, health effects presented in this report are conservatively estimated, and the actual effects may be zero.

Additional discussion of the uncertainty associated with C-R functions and health effect estimates is included in Attachment C.

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ATTACHMENT A
EMISSIONS INVENTORY, SPATIAL ALLOCATION, AND SMOKE SETUP

1. INTRODUCTION

Operational emissions from the Project were estimated using the California Emissions Estimator Model (CalEEMod®) and Project-specific data, where available. The model employs widely accepted calculation methodologies for emission estimates combined with appropriate default data if site-specific information is not available.

Annual emission estimates from the Project need to be spatially gridded, temporally allocated, and chemically speciated to be used for photochemical grid modeling. The Sparse Matrix Operator Kerner Emissions (SMOKE) emissions modeling system (Coats, 1996; Coats and Houyoux, 1996)[19] is used for this process.

2. PROJECT EMISSIONS AND SPATIAL ALLOCATION

Emissions were estimated for the Project to support the photochemical grid model (PGM) and are allocated into 4 km x 4 km grid cells. This section describes those emissions and how they were spatially allocated.

2.1 Project Emissions and Spatial Allocation

For use in PGMs, emissions must be spatially allocated over the area so that they can be incorporated into the baseline gridded emission inventory, as developed by the Bay Area Air Quality Management District (BAAQMD), and adapted for this analysis as discussed in Attachment B. The average daily 2050 incremental emission inventory for the Project is shown below in Table 2-1.[20] Incremental emissions were calculated as the difference between the 2050 full Project buildout emissions and a hypothetical 2050 no-Project condition approximated using the 2019 baseline operational activity scaled for 2050 emission factors. This is the appropriate increment to model over a 2050 base year, which accounts for background travel projected to 2050. This increment is notably different than that used for comparison to BAAQMD California Environmental Quality Act (CEQA) thresholds of significance, which subtracts a 2019 Baseline, and thus will not match what is presented in Draft EIR Section 4.2 Air Quality. As such, this analysis is more conservative than that presented in the Air Quality Section as here a larger Project increment is evaluated.

Project emissions modeled in the PGM include oxides of nitrogen (NOx), reactive organic gases (ROG), fine primary particulate matter ($PM_{2.5}$), carbon monoxide (CO), and sulfur dioxide (SO_2). Since some of these pollutants incorporate a wide range of chemical species (e.g., ROG and PM), the Project emissions were further speciated into detailed chemical species or groups of species to be used as inputs for the PGM's robust chemistry solver. NO_X and ROG are precursors to ozone and, along with SO_2, are also precursors to secondarily formed $PM_{2.5}$. CO also plays a smaller role in the formation of ozone and is thus conservatively evaluated here. Mobile source emissions were split into categories based on the EMFAC2017 emission rates. For PM, less than 2.5 microns in diameter ($PM_{2.5}$) emissions are used in the modeling; less than 10 microns in diameter (PM_{10}) emissions are presented for information below.

[19] https://www.cmascenter.org/smoke/

[20] Average daily emissions are modeled here as the Project's operations are generally consistent throughout the year.

Table 2-1. Average Daily 2050 Incremental Emissions, Full Project Buildout

Emission Category	NOx	ROG[21]	PM_{10}	$PM_{2.5}$	SO_2	CO
	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
Mobile	117	38	123	36	1.6	434
Diurnal	--	1.8	--	--	--	--
Hotsoak	--	4.2	--	--	--	--
Idling Exhaust	0.89	0.88	1.9E-04	3.9E-04	0.0039	13
Brakewear	--	--	0.79	0.78	--	--
Tirewear	--	--	0.17	0.10	--	--
Resting Loss	--	1.9	--	--	--	--
Road Dust	--	--	122	35	--	--
Running Exhaust	57	2.6	0.019	0.040	1.5	252
Running Loss	--	18	--	--	--	--
Starting Exhaust	59	8.2	0.0024	0.0051	0.047	170
Architectural Coatings	--	6.0	--	--	--	--
Consumer Products	--	31	--	--	--	--
Landscaping	8.2E-04	0.0087	3.3E-04	3.3E-04	--	0.10
Energy	2.1	0.23	0.16	0.16	0.012	1.7
Emergency Generators	1.0	0.0059	0.020	0.020	0.0020	0.34
Central Utility Plant	4.9	3.2	8.8	8.2	0.80	11
Total	125	79	132	44	2.4	447

All emissions listed in Table 2-1 represent the average daily incremental operational emissions estimated for the proposed Project's 2050 buildout scenario. Emissions were derived following methodologies as outlined in Draft EIR Section 4.2 Air Quality.

Mobile emissions include light, medium, and heavy-duty vehicles. Table 2-2 below provides a summary of the spatial distribution of mobile emissions broken down by primary routes taken to and from the campus. Values in this table were calculated based on estimated trip counts split by faculty/staff/students, patients/visitors, and residents, along with average trip distances on primary routes.[22]

[21] ROG means total organic gases minus ARB's "exempt" compounds (e.g., methane, ethane, CFCs, etc.). ROG is similar, but not identical, to USEPA's term "VOC", which is based on USEPA's exempt list, which is slightly different from ARB's list. ROG emissions are modeled as VOC emissions in this assessment.

[22] Trip route distribution percentages were calculated from data in EIR Chapter 4.15 (Tables 4.15-10 and 4.15-11) in combination with detailed trip length and route endpoint data provided by the Adavant Consulting (email communication, April 9, 2020).

Table 2-2. Mobile Emission Distribution

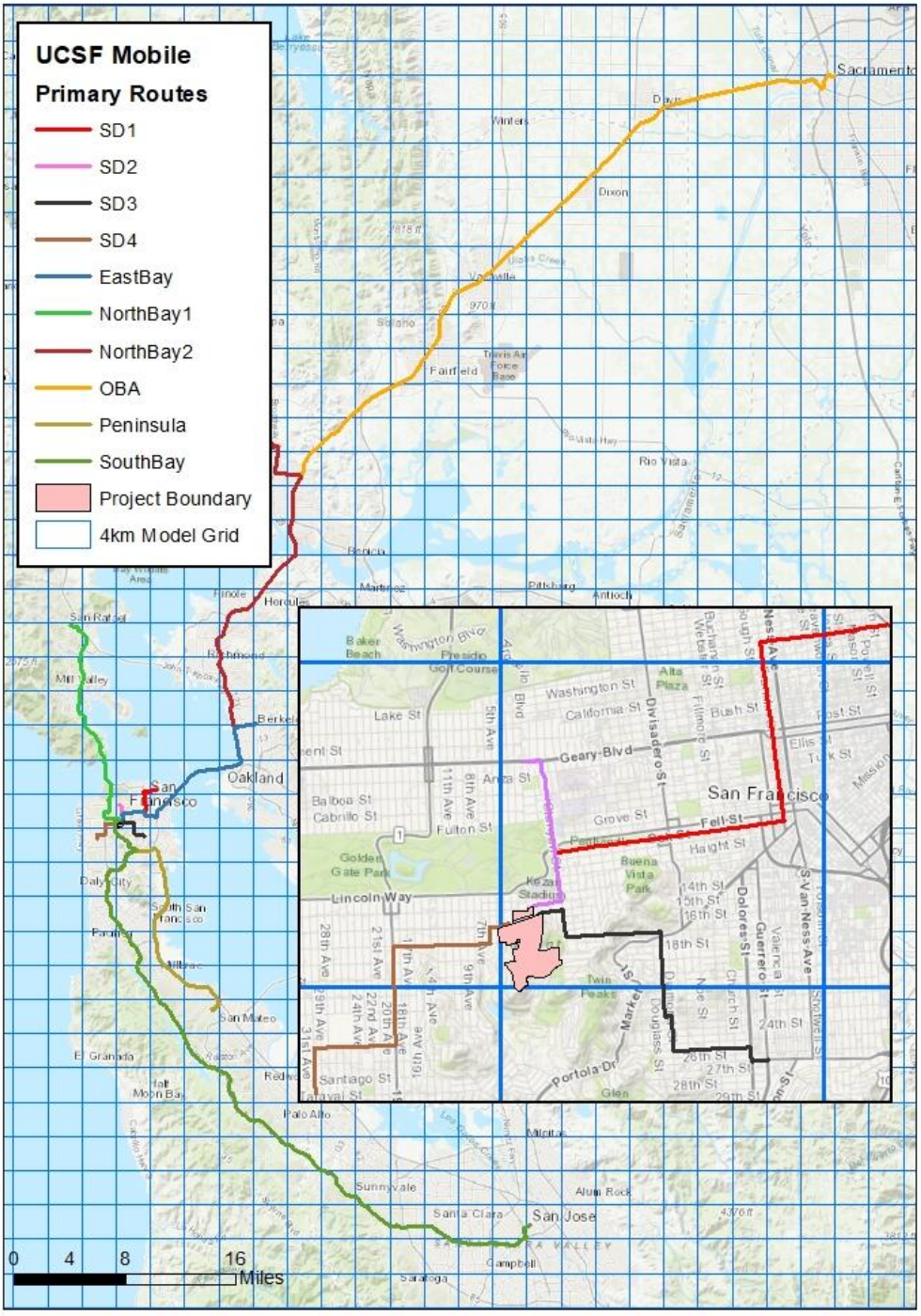
Primary Routes	Distribution (%)[1]
Northeast San Francisco Super District (SD1)	1.3
Northwest San Francisco Super District (SD2)	0.75
Southeast San Francisco Super District (SD3)	2.8
Southwest San Francisco Super District (SD4)	1.6
East Bay	21
North Bay 1	8.9
North Bay 2	4.6
Outside Bay Area (OBA)	39
Peninsula	15
South Bay	5.2

Note:
1. Total may not add to 100 percent due to rounding.

Project emissions are allocated across the Project site into 4 km x 4 km grid cells for the PGM. Figure 2-1 below shows the Project boundary overlaid with the 4-km grid. The Project site is shown in peach, and the primary routes are shown in varied colors.[23] For primary routes that cross into multiple cells, emissions were allocated proportionally based on the length of roadway within each cell.

[23] The spatial distribution of the primary routes was determined based on route endpoint data provided by Adavant Consulting (email communication, April 9, 2020). For zones with multiple endpoints (i.e. East Bay) the emissions are mapped up to the point where the main route splits, or they are split into two routes (e.g. NorthBay 1 and NorthBay 2).

Figure 2-1. Overlap of Model Grid Cells on Project Site and Primary Routes



2.2 Converting Project Inventories to SMOKE Input Format

The first step in the emissions processing was to convert the Project emission inventory into the Flat File 2010 (FF10) format for input to SMOKE. We assigned appropriate Source Classification Codes (SCCs) to the Project emissions sources. Table 2-3 provides SCC assigned to each project source.

Table 2-3. Assigned SCC to Project Emission Sources

Emission Source	SCC	SCC Description
Energy	2103006000	Stationary Source Fuel Combustion; Commercial/Institutional; Natural Gas; Total: Boilers and IC Engines
Mobile -LDA	220100111B	Mobile Sources; Highway Vehicles - Gasoline; Light Duty Gasoline Vehicles (LDGV); Rural[24] Interstate: Brake Wear
Mobile -LDA	220100111R	Mobile Sources; Highway Vehicles - Gasoline; Light Duty Gasoline Vehicles (LDGV); Rural Interstate: Resting Loss
Mobile -LDA	220100111S	Mobile Sources; Highway Vehicles - Gasoline; Light Duty Gasoline Vehicles (LDGV); Rural Interstate: Start
Mobile -LDA	220100111T	Mobile Sources; Highway Vehicles - Gasoline; Light Duty Gasoline Vehicles (LDGV); Rural Interstate: Tire Wear
Mobile -LDA	220100111V	Mobile Sources; Highway Vehicles - Gasoline; Light Duty Gasoline Vehicles (LDGV); Rural Interstate: Evap (except Refueling)
Mobile -LDA	220100111X	Mobile Sources; Highway Vehicles - Gasoline; Light Duty Gasoline Vehicles (LDGV); Rural Interstate: Exhaust
Mobile -LDT1	220102011B	Mobile Sources; Highway Vehicles - Gasoline; Light Duty Gasoline Trucks 1 & 2 (M6) = LDGT1 (M5); Rural Interstate: Brake Wear
Mobile -LDT1	220102011R	Mobile Sources; Highway Vehicles - Gasoline; Light Duty Gasoline Trucks 1 & 2 (M6) = LDGT1 (M5); Rural Interstate: Resting Loss
Mobile -LDT1	220102011S	Mobile Sources; Highway Vehicles - Gasoline; Light Duty Gasoline Trucks 1 & 2 (M6) = LDGT1 (M5); Rural Interstate: Start
Mobile -LDT1	220102011T	Mobile Sources; Highway Vehicles - Gasoline; Light Duty Gasoline Trucks 1 & 2 (M6) = LDGT1 (M5); Rural Interstate: Tire Wear
Mobile -LDT1	220102011V	Mobile Sources; Highway Vehicles - Gasoline; Light Duty Gasoline Trucks 1 & 2 (M6) = LDGT1 (M5); Rural Interstate: Evap (except Refueling)
Mobile -LDT1	220102011X	Mobile Sources; Highway Vehicles - Gasoline; Light Duty Gasoline Trucks 1 & 2 (M6) = LDGT1 (M5); Rural Interstate: Exhaust
Mobile -HHDT	2201070110	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Interstate: Total
Mobile -HHDT	220107011B	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Interstate: Brake Wear
Mobile -LHDT1	220107011I	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Interstate: Idling
Mobile -HHDT	220107011R	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Interstate: Resting Loss

[24] Rural and Urban mobile designations provide equivalent chemical speciation and temporal distributions, as the EMFAC mobile emissions model does not distinguish between the two.

Table 2-3. Assigned SCC to Project Emission Sources

Emission Source	SCC	SCC Description
Mobile -HHDT	220107011S	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Interstate: Start
Mobile -HHDT	220107011T	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Interstate: Tire Wear
Mobile -HHDT	220107011V	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Interstate: Evap (except Refueling)
Mobile -HHDT	220107011X	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Interstate: Exhaust
Mobile -OBUS	220107013B	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Other Principal Arterial: Brake Wear
Mobile -OBUS	220107013I	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Other Principal Arterial: Idling
Mobile -OBUS	220107013R	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Other Principal Arterial: Resting Loss
Mobile -OBUS	220107013S	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Other Principal Arterial: Start
Mobile -OBUS	220107013T	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Other Principal Arterial: Tire Wear
Mobile -OBUS	220107013V	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Other Principal Arterial: Evap (except Refueling)
Mobile -OBUS	220107013X	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Other Principal Arterial: Exhaust
Mobile -OBUS	2201070130	Mobile Sources; Highway Vehicles - Gasoline; Heavy Duty Gasoline Vehicles 2B thru 8B & Buses (HDGV); Rural Other Principal Arterial: Total
Mobile -MCY	220108011B	Mobile Sources; Highway Vehicles - Gasoline; Motorcycles (MC); Rural Interstate: Brake Wear
Mobile -MCY	220108011R	Mobile Sources; Highway Vehicles - Gasoline; Motorcycles (MC); Rural Interstate: Resting Loss
Mobile -MCY	220108011S	Mobile Sources; Highway Vehicles - Gasoline; Motorcycles (MC); Rural Interstate: Start
Mobile -MCY	220108011T	Mobile Sources; Highway Vehicles - Gasoline; Motorcycles (MC); Rural Interstate: Tire Wear
Mobile -MCY	220108011V	Mobile Sources; Highway Vehicles - Gasoline; Motorcycles (MC); Rural Interstate: Evap (except Refueling)
Mobile -MCY	220108011X	Mobile Sources; Highway Vehicles - Gasoline; Motorcycles (MC); Rural Interstate: Exhaust

Table 2-3. Assigned SCC to Project Emission Sources

Emission Source	SCC	SCC Description
Mobile -LDA	223000111B	Mobile Sources; Highway Vehicles - Diesel; Light Duty Diesel Vehicles (LDDV); Rural Interstate: Brake Wear
Mobile -LDA	223000111T	Mobile Sources; Highway Vehicles - Diesel; Light Duty Diesel Vehicles (LDDV); Rural Interstate: Tire Wear
Mobile -LDA	223000111X	Mobile Sources; Highway Vehicles - Diesel; Light Duty Diesel Vehicles (LDDV); Rural Interstate: Exhaust
Mobile -LDT1	223006011B	Mobile Sources; Highway Vehicles - Diesel; Light Duty Diesel Trucks 1 thru 4 (M6) (LDDT); Rural Interstate: Brake Wear
Mobile -LDT1	223006011T	Mobile Sources; Highway Vehicles - Diesel; Light Duty Diesel Trucks 1 thru 4 (M6) (LDDT); Rural Interstate: Tire Wear
Mobile -LDT1	223006011X	Mobile Sources; Highway Vehicles - Diesel; Light Duty Diesel Trucks 1 thru 4 (M6) (LDDT); Rural Interstate: Exhaust
Mobile -LHDT1	223007111B	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Vehicles (HDDV) Class 2B; Rural Interstate: Brake Wear
Mobile -LHDT1	223007111I	Mobile Sources; Highway Vehicles – Diesel; Heavy Duty Diesel Vehicles (HDDV) Class 2B; Rural Interstate: Idling
Mobile -LHDT1	223007111T	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Vehicles (HDDV) Class 2B; Rural Interstate: Tire Wear
Mobile -LHDT1	223007111X	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Vehicles (HDDV) Class 2B; Rural Interstate: Exhaust
Mobile -MHDT	2230072110	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Vehicles (HDDV) Class 3, 4, & 5; Rural Interstate: Total
Mobile -LHDT2	223007211B	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Vehicles (HDDV) Class 3, 4, & 5; Rural Interstate: Brake Wear
Mobile -LHDT2	223007211I	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Vehicles (HDDV) Class 3, 4, & 5; Rural Interstate: Idling
Mobile -LHDT2	223007211T	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Vehicles (HDDV) Class 3, 4, & 5; Rural Interstate: Tire Wear
Mobile -LHDT2	223007211X	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Vehicles (HDDV) Class 3, 4, & 5; Rural Interstate: Exhaust
Mobile -HHDT	223007311B	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Vehicles (HDDV) Class 6 & 7; Rural Interstate: Brake Wear
Mobile -HHDT	223007311I	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Vehicles (HDDV) Class 6 & 7; Rural Interstate: Idling
Mobile -HHDT	223007311S	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Vehicles (HDDV) Class 6 & 7; Rural Interstate: Start
Mobile -HHDT	223007311T	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Vehicles (HDDV) Class 6 & 7; Rural Interstate: Tire Wear

Table 2-3. Assigned SCC to Project Emission Sources

Emission Source	SCC	SCC Description
Mobile -HHDT	223007311X	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Vehicles (HDDV) Class 6 & 7; Rural Interstate: Exhaust
Mobile -OBUS	223007513B	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Buses (School & Transit); Rural Other Principal Arterial: Brake Wear
Mobile -OBUS	223007513I	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Buses (School & Transit); Rural Other Principal Arterial: Idling
Mobile -OBUS	223007513S	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Buses (School & Transit); Rural Other Principal Arterial: Start
Mobile -OBUS	223007513T	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Buses (School & Transit); Rural Other Principal Arterial: Tire Wear
Mobile -OBUS	223007513X	Mobile Sources; Highway Vehicles - Diesel; Heavy Duty Diesel Buses (School & Transit); Rural Other Principal Arterial: Exhaust
Fugitive Dust	2294000000	Mobile Sources; Paved Roads; All Paved Roads; Total: Fugitives
Landscaping Equipment	2265004010	Mobile Sources; Off-highway Vehicle Gasoline, 4-Stroke; Lawn and Garden Equipment; Lawn Mowers (Residential)
Central Utility Plant	20300202	Internal Combustion Engines; Commercial/Institutional; Natural Gas; Turbine
Emergency Generators	20300101	Internal Combustion Engines; Commercial/Institutional; Distillate Oil (Diesel); Reciprocating
Architectural Coating	2401001000	Solvent Utilization; Surface Coating; Architectural Coatings; Total: All Solvent Types
Consumer Products	2460000000	Solvent Utilization; Miscellaneous Non-industrial: Consumer and Commercial; All Processes; Total: All Solvent Types
Consumer Products	2460100000	Solvent Utilization; Miscellaneous Non-industrial: Consumer and Commercial; All Personal Care Products; Total: All Solvent Types
Consumer Products	2460200000	Solvent Utilization; Miscellaneous Non-industrial: Consumer and Commercial; All Household Products; Total: All Solvent Types
Consumer Products	2460400000	Solvent Utilization; Miscellaneous Non-industrial: Consumer and Commercial; All Automotive Aftermarket Products; Total: All Solvent Types
Consumer Products	2460500000	Solvent Utilization; Miscellaneous Non-industrial: Consumer and Commercial; All Coatings and Related Products; Total: All Solvent Types
Consumer Products	2460600000	Solvent Utilization; Miscellaneous Non-industrial: Consumer and Commercial; All Adhesives and Sealants; Total: All Solvent Types
Consumer Products	2460800000	Solvent Utilization; Miscellaneous Non-industrial: Consumer and Commercial; All FIFRA Related Products; Total: All Solvent Types

Table 2-3. Assigned SCC to Project Emission Sources

Emission Source	SCC	SCC Description
Consumer Products	2460900000	Solvent Utilization; Miscellaneous Non-industrial: Consumer and Commercial; Miscellaneous Products (Not Otherwise Covered); Total: All Solvent Types

2.2.1 Generate Spatial Surrogates for 4-km Domains

As part of the analysis, the Project source emissions need to be spatially allocated to appropriate geographic locations. The emissions can be allocated to modeling grid cells using gridding surrogates. To process the Project emissions, a Project area-based spatial surrogate was developed. The surrogate was developed using the US Environmental Protection Agency (USEPA's) Spatial Allocation Tool,[25] which combines geographical information system (GIS)-based data (shapefiles) and modeling domain definitions to generate the appropriate gridded surrogate data set. The Project sources were then assigned specific surrogates for gridding by cross-referencing the SCCs. As mentioned above, all Project emissions were distributed in the modeling grid cells where the Project is located as shown in Figure 2-1. The mobile sources were spatially distributed in the site's grid cells and surrounding grid cells, as outlined in Table 2-2.

2.2.2 SMOKE 4 km Processing of Project Emissions

SMOKE system was used to process emissions for the Northern California 4-km modeling grid shown in Figure 2-1. Although CAMx is run for each day of the year using each day's meteorological data, emissions are processed using a representative week from each month (seven days a month) to represent the entire month's emissions. This method is used for emissions to avoid redundancy in data and save disk space and computational time since emissions, temporally, during one week of a given month are likely very similar to emissions from a different week of the same month. Holidays were modeled separately as if they were a Sunday. SMOKE was applied to perform following tasks:

1. Chemical Speciation: Emission estimates of criteria air pollutants were speciated for the SAPRC07 AERO6 chemical mechanism employed in CMAQ in SMOKE processing. We used speciation profiles compatible with the SAPRC07 AERO6 mechanism for PM2.5 from the BAAQMD's modeling system to be consistent with the regional modeling emissions. We then converted those emissions into CAMx-ready formats using CMAQ2CAMx conversion program and species mapping.
2. Temporal Allocation: Annual emission estimates were resolved on an hourly timescale for CAMx modeling. These allocations were determined from the particular source category, specified by the SCC. Monthly, weekly, and diurnal profiles were cross-referenced to SCC to provide the appropriate temporal resolution. The temporal profiles were also obtained from the BAAQMD's emissions modeling system.
3. Spatial Allocation: The Project emission estimates were spatially resolved to the grid cells for modeling using spatial surrogates as described above.

[25] https://www.cmascenter.org/sa-tools/documentation/4.2/html/srgtool/SurrogateToolUserGuide_4_2.pdf

2.2.3 QA/QC of Emissions Modeling

Standard quality assurance/quality control (QA/QC) was conducted during all aspects of the SMOKE emissions processing. These steps followed the approach recommended in USEPA modeling guidance (USEPA, 2007). SMOKE includes quality assurance (QA) and reporting features to keep track of the adjustments at each processing stage and ensure that data integrity is not compromised. We carefully reviewed the SMOKE log files for error messages and ensured that appropriate source profiles were used. All error records reported during processing were reviewed and resolved. This is important to ensure that source categories are correctly characterized. We also compared SMOKE input and output emissions: Summary tables were generated to compare input inventory totals against model-ready output totals to confirm consistency. Spatial plots were generated to visually verify correct spatial allocation of the emissions.

2.2.4 Merge SMOKE Pre-merged Emissions to Generate CAMx-ready Emission Inputs

The final step in the emissions processing is to merge the Project gridded emissions with other regional components through the gridded merge program (MRGUAM) for CAMx. We merged the daily emissions in the time format required by CAMx.

2.2.5 Emissions Summary

Summaries of the Project gridded CAMx model-ready emissions data are provided in this section. Table 2-4 and Table 2-5 summarize the annual emission inventory data input to SMOKE from the FF10 data files in pounds per day by project source types, by pollutants and by project regions. The consistency in data in Table 2-4 and Table 2-5 as well as Table 2-1 offer confidence in the correct operation of the SMOKE emissions processing for CAMx.

Table 2-4. Project Emission Inventory Data Input to SMOKE by Source Type (2050, Average lbs/day)

Type	NO_X	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO
Mobile	117	38	123	36	1.6	434
Architectural Coatings	--	6.0	--	--	--	--
Consumer Products	--	31	--	--	--	--
Landscaping	8.2E-04	0.0087	3.3E-04	3.3E-04	0.0E+00	0.10
Energy	2	0.2	0.16	0.16	0.01	2
Emergency Generators	1.0	0.01	0.02	0.02	0.002	0.34
Central Utility Plant	5	3.2	9	8	0.8	11
Total	125	79	132	44	2.4	447

Table 2-5. Project Emission Inventory Data Output from SMOKE by Project Region (2050, Average lbs/day)

Type	NO_X	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO
Onsite	42	59	18	11	1.0	124
Offsite	83	20	114	33	1.4	324
Total	125	79	132	44	2.4	447

Spatial displays of the gridded emissions data are presented below. We examined the gridded emissions in 4-km grid to verify accurate spatial allocation by SMOKE. Figures 2-2 through 2-7 displays gridded emissions for the Project inventory in the 4-km modeling grid.[26]

[26] Emissions of each pollutant are spatially allocated across all grid cells where emissions are present, however, some grid cells may show as blank in the Figures below due to the color scale.

Figure 2-2. Spatial Distribution of NO_x Emissions (in lbs/day) for the Project in the Northern California 4-km Domain

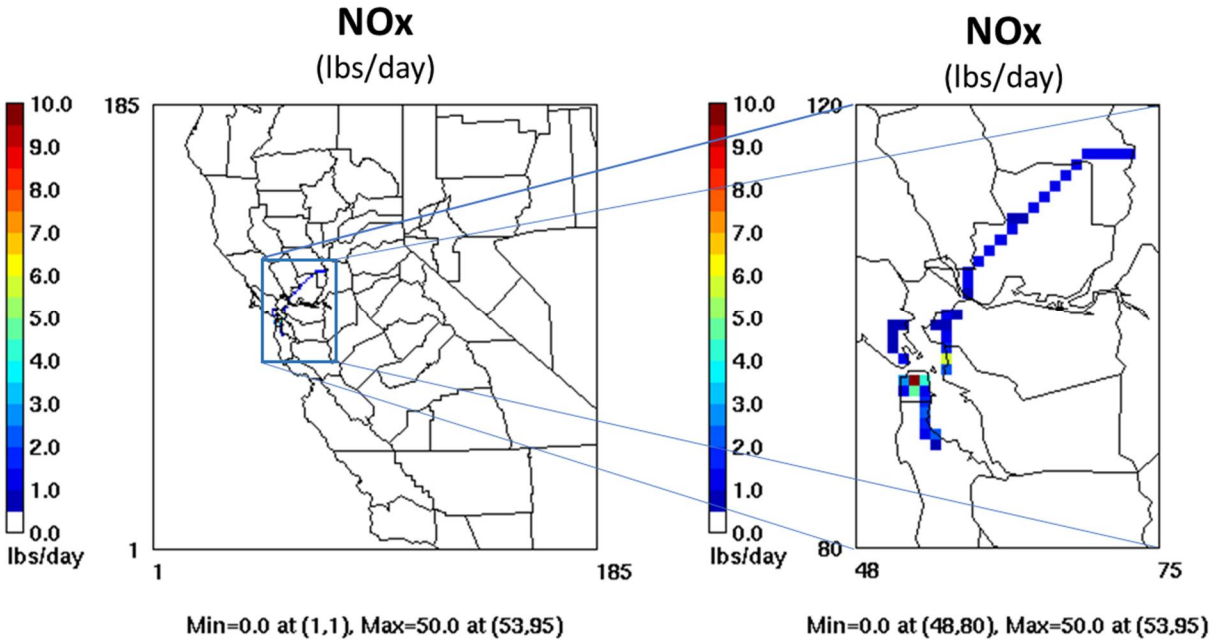


Figure 2-3. Spatial Distribution of VOC Emissions (in lbs/day) for the Project in the Northern California 4-km Domain

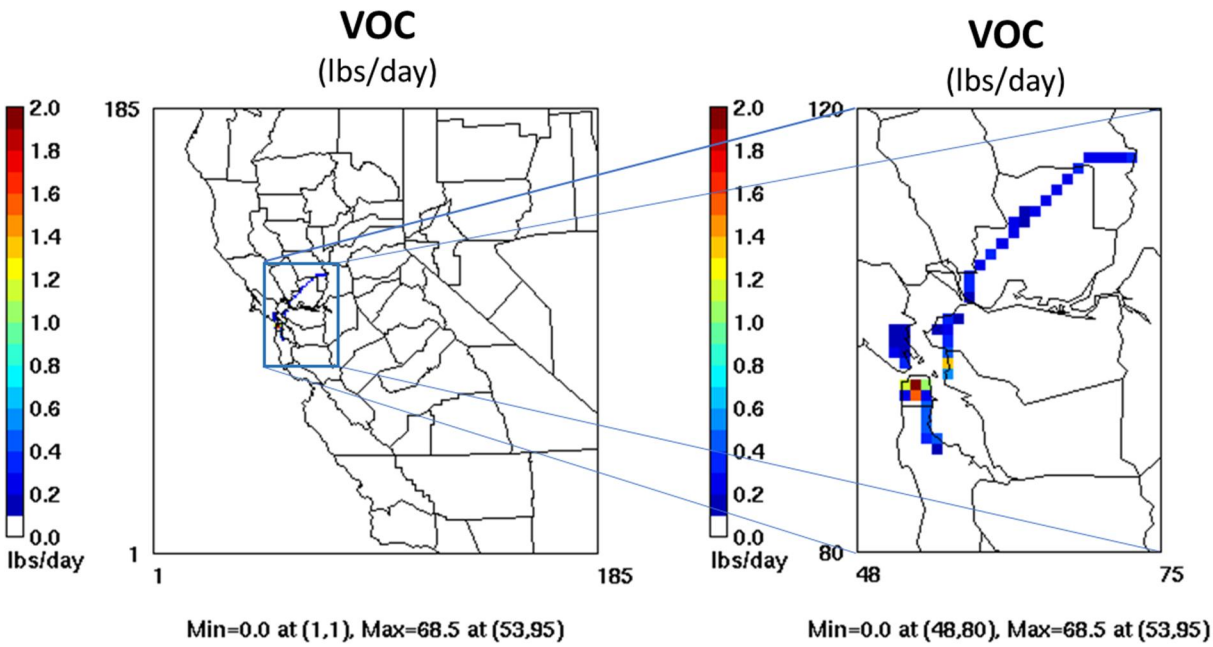


Figure 2-4. Spatial Distribution of PM_{10} Emissions (in lbs/day) for the Project in the Northern California 4-km Domain

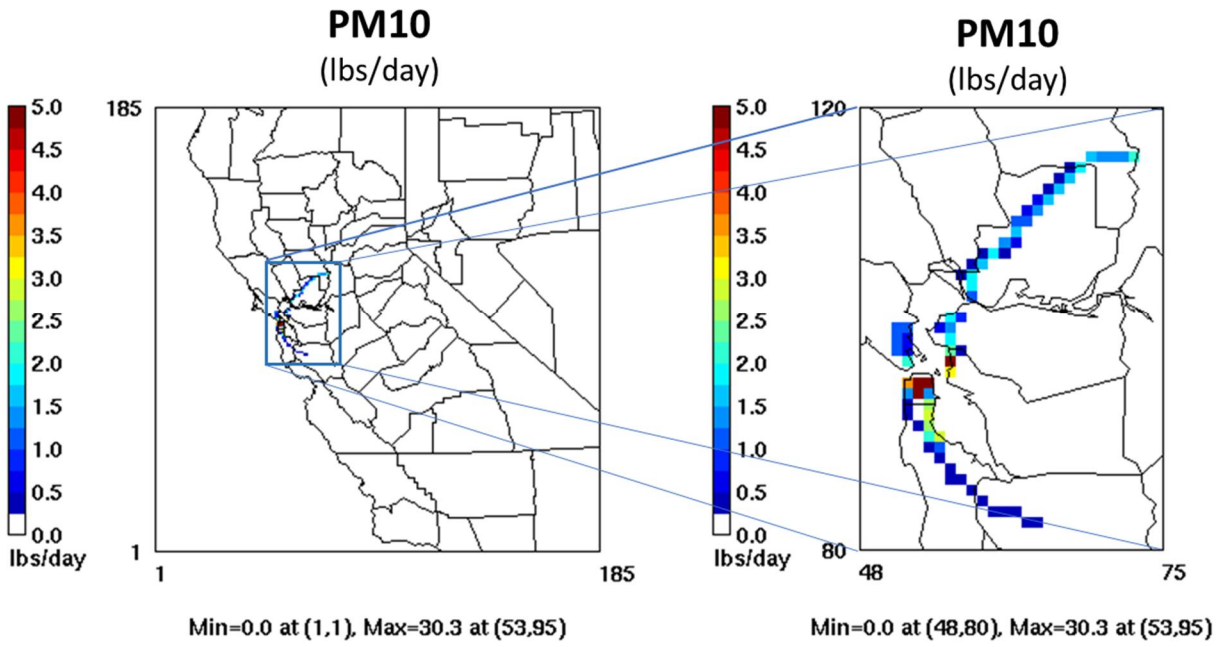


Figure 2-5. Spatial Distribution of $PM_{2.5}$ Emissions (in lbs/day) for the Project in the Northern California 4-km Domain

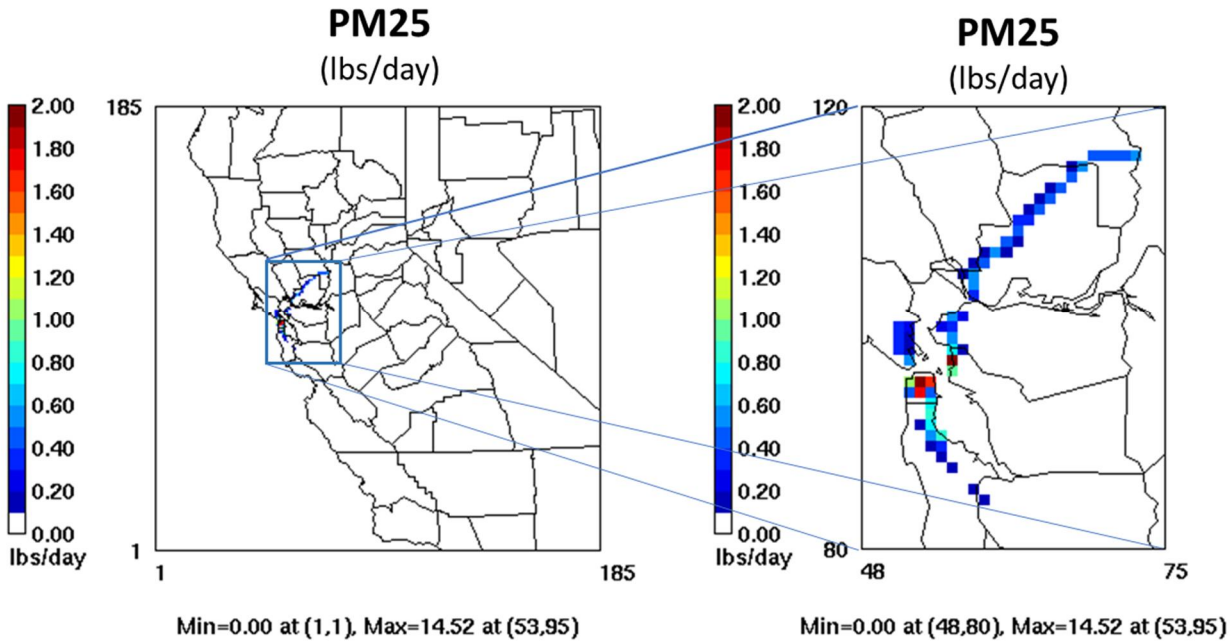


Figure 2-6. Spatial Distribution of SO_2 Emissions (in lbs/day) for the Project in the Northern California 4-km Domain

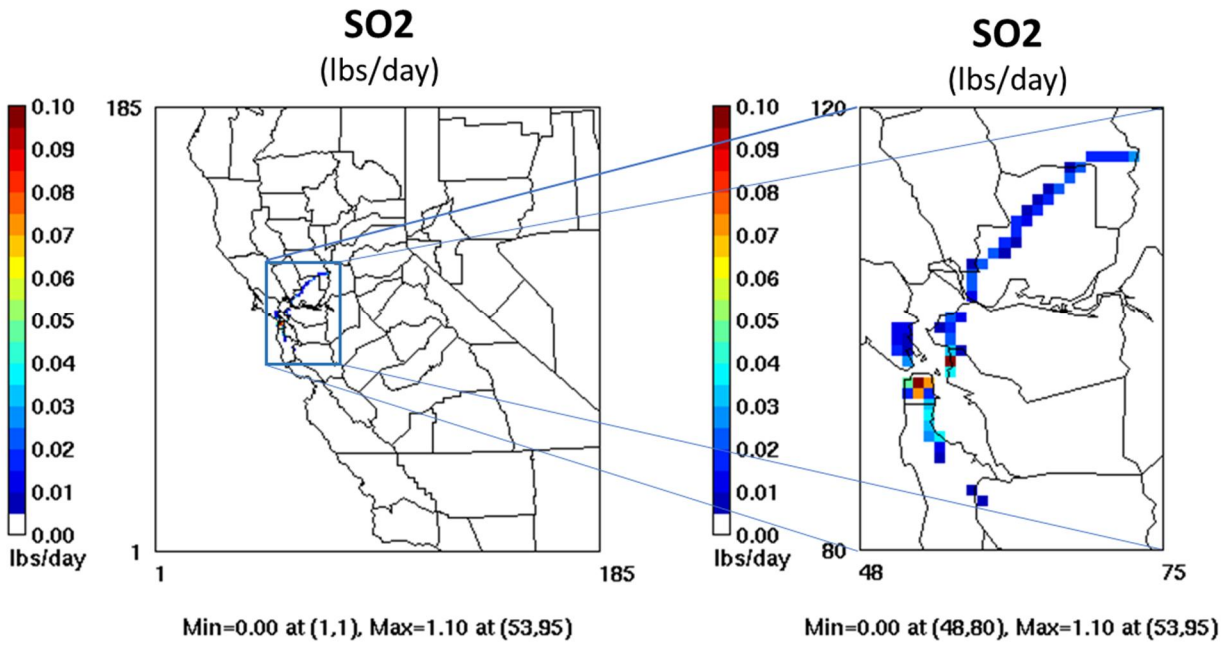
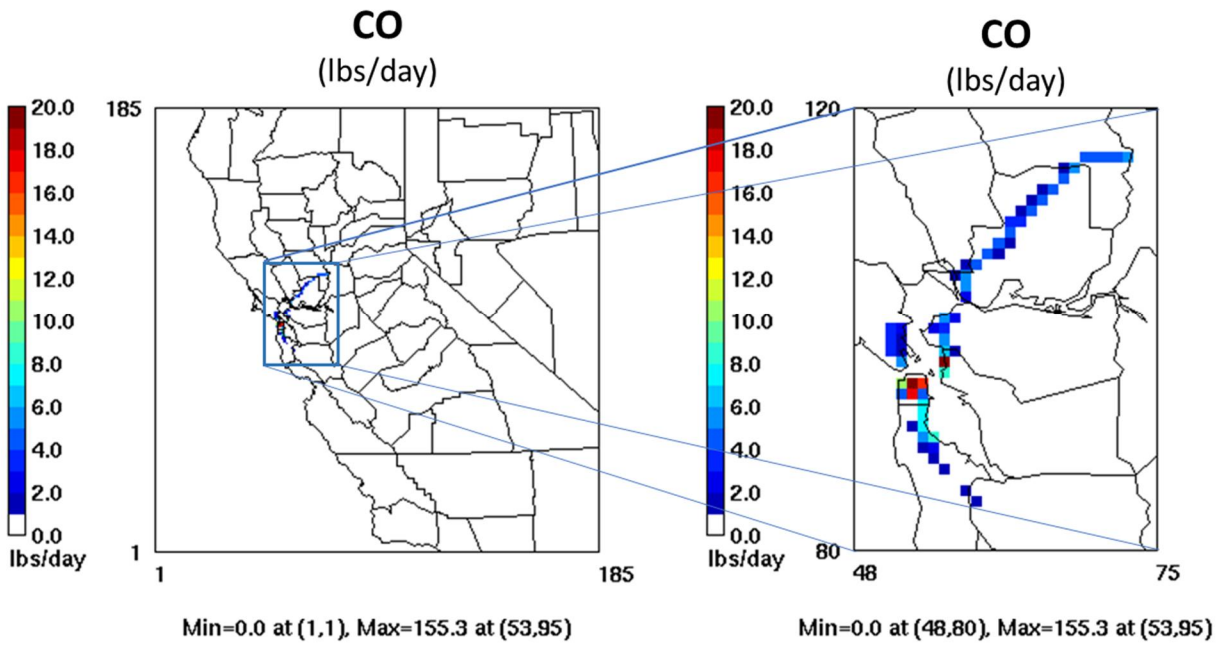


Figure 2-7. Spatial Distribution of CO Emissions (in lbs/day) for the Project in the Northern California 4-km Domain



3. EMISSIONS FROM THE INITIAL PHASE PROJECTS [IRVING STREET ARRIVAL, RESEARCH AND ACADEMIC BUILDING, AND INITIAL ALDEA HOUSING DENSIFICATION]

As the potential health effects from the Initial Phase Projects are generally characterized using the full Project level modeling results and a comparison of total emissions, details of the incremental operational emissions associated with the Initial Phase Projects are discussed below.

Incremental operational emissions associated with the Initial Phase Projects were estimated for the year of buildout (2030). Initial Phase Projects include Irving Street Arrival, Research and Academic Building, and initial Aldea housing densification and do not include the New Hospital. Emissions associated with these projects include emissions from architectural coatings, VOCs in consumer products, landscaping equipment, emergency generators, central utility plant (CUP), and emissions associated with motor vehicle use. Incremental emissions for 2030 are shown in Table 2-6 and were derived following methodologies as outlined in Draft EIR Section 4.2 Air Quality.

Table 2-6. Average Daily Incremental 2030 Emissions, Initial Phase Projects

Emission Category	NOx	ROG	PM_{10}	$PM_{2.5}$	SO_2	CO
	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day	lbs/day
On-Road Mobile	19	5.5	23	6.6	0.32	76
Architectural Coatings	--	1.3	--	--	--	--
Consumer Products	--	8.8	--	--	--	--
Landscaping	0.067	0.17	0.032	0.032	3.3E-04	5.8
Energy[1]	-1.3	-1.0	-0.090	-0.090	--	--
Emergency Generators	1.0	0.0059	0.020	0.020	0.0020	0.34
Central Utility Plant	0.17	0.11	0.32	0.30	0.026	0.35
Total	19	15	23	6.9	0.35	83
Change from 2050 Emissions	-81%	-85%	-83%	-84%	-85%	-81%

Notes:
1. The Initial Phase Projects include removal of existing sources, which leads to a decrease in incremental energy emissions.

4. CONSTRUCTION EMISSIONS

As the potential health effects from construction activity are generally discussed, in comparison to the potential health effects from the full Project level modeling results, details of construction emissions quantified are presented below.

Construction emissions were quantified both for the Initial Phase Projects (Irving Street Arrival, Research and Academic Building, and initial Aldea housing densification) and the New Hospital for years 2022 through 2029. Details of phasing and sequencing in 2030 and beyond are not yet available and thus emissions, including potential overlapping construction

and operational emissions, cannot be accurately quantified beyond that year. Construction emissions were quantified following methodologies as outlined in Draft EIR Section 4.2 Air Quality and are shown in Table 2-7 below.

Table 2-7. Maximum Daily Unmitigated Construction Emissions, Initial Phase Projects + New Hospital (2022-2029)

Year	NOx	ROG	PM_{10}	$PM_{2.5}$
	lbs/day	lbs/day	lbs/day	lbs/day
2022	51	3.9	1.7	1.6
2023	24	2.7	0.95	0.89
2024	51	10	1.4	1.3
2025	43	10	1.0	1.0
2026	51	5.0	1.0	1.0
2027	25	2.5	0.50	0.48
2028	26	22	0.55	0.53
2029	26	31	0.56	0.53
Maximum	51	31	1.7	1.6
Change from 2050 Emissions	-59%	-61%	-99%	-96%

5. REFERENCES

Coats Jr., C.J., 1996. High-performance algorithms in the Sparse Matrix Operator Kernel Emissions (SMOKE) modeling system. Proc. Ninth AMS Joint Conference on Applications of Air Pollution Meteorology with AWMA. Amer. Meteor. Soc., Atlanta, GA, 584-588.

Coats Jr., C.J., Houyoux, M.R., 1996. Fast Emissions Modeling with the Sparse Matrix Operator Kernel Emissions (SMOKE) Modeling System. The Emission Inventory: Key to Planning, Permits, Compliance, and Reporting, Air & Waste Management Association. New Orleans, Louisiana.

EPA, 2007. Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5 and Regional Haze. Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, NC. EPA-454/B-07-002.

ATTACHMENT B
PGM INPUTS, OUTPUTS, AND ASSUMPTIONS

1. REGIONAL AIR QUALITY MODELING PLATFORM

The latest publicly available Photochemical Grid Model (PGM) database for Northern California was developed by the Bay Area Air Quality Management District (BAAQMD) in support of the 2000 Central California Ozone Study (CCOS), and was adapted for this analysis.[27] The Northern California 2012 4-km CAMx modeling database and a projected 2050 emissions database was used in this assessment. The 2012 base case is based on a PGM modeling databases developed by the BAAQMD. The BAAQMD PGM database is tailored for California using California-specific input tools (e.g., the EMFAC[28] mobile source emissions model) and use a high-resolution 4-km horizontal grid to better simulate meteorology and air quality in the complex terrain and coastal environment of California. This contrasts with the United States Environmental Protection Agency's (USEPA)national modeling platforms[29] used for national rulemakings (e.g., transport rules such as CSAPR[30] or defining new NAAQS) that use a coarser 12-km horizontal grid resolution.

The BAAQMD selected the computational domain shown in Figure 1-1 below to keep consistency with the 2000 CCOS (BAAQMD, 2009). The CCOS was established to understand and investigate the ozone formation in Central California, therefore the computational domain included all Central California and portions of Northern California.

Details of the model inputs, configuration, and results are presented in Section 2 of this Attachment.

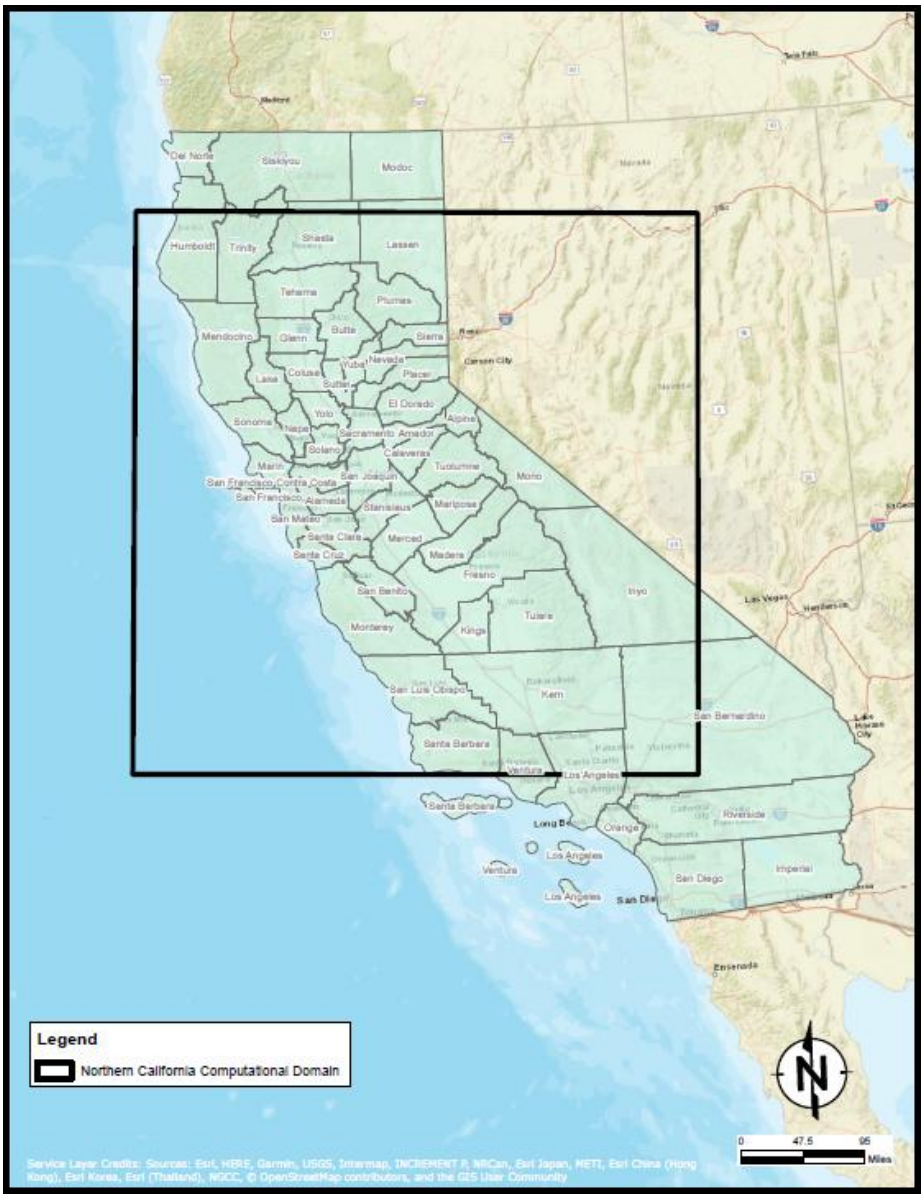
[27] http://www.baaqmd.gov/about-air-quality/research-and-data/research-and-modeling.

[28] https://www.arb.ca.gov/emfac/

[29] https://www.epa.gov/air-emissions-modeling/2014-2016-version-7-air-emissions-modeling-platforms

[30] https://www.epa.gov/csapr

Figure 1-1. Air quality modeling domain for Northern California[31]



2. REGIONAL GRID MODELING

In this section we describe the regional PGM modeling setup to assess the outcome of the Project emissions on the ambient PM2.5 levels in the region. The 2012 base case modeling databases were developed by the BAAQMD for the Community Multiscale Air Quality (CMAQ) PGM. The CMAQ annual 2012 4-km modeling database and annual 2012 4-km Weather Research and Forecasting (WRF) meteorological model output files were obtained from the BAAQMD. The BAAQMD CMAQ and WRF 2012 4-km data were then processed to obtain 2012

[31] https://ww3.arb.ca.gov/research/cabots/docs/9a-cabots-baaqmd-20170419.pdf

4-km annual PGM modeling database for the Comprehensive Air Quality Model with extensions (CAMx). The following paragraphs described how Ramboll developed the CAMx 2012 4-km annual database used in this study, starting with the BAAQMD CMAQ and WRF 2012 4-km data. Preparation of the Project emissions inputs for CAMx is discussed in Attachment A.

2.1 Model Inputs and Configuration

Ramboll converted the 2012 CMAQ 2-D and in-line point emissions files from BAAQMD to CAMx area-/point-source emissions files using the CMAQ2CAMx interface program.[32] Seasalt emissions were developed using an emissions processor that integrates published sea spray flux algorithms to estimate sea salt particulate matter (PM) emissions for input to CAMx. The CAMx sea salt emissions were then merged with area emissions files. On-road mobile sources in the BAAQMD database were based on EMFAC2014. Thus, on-road mobile sources were first updated to EMFAC2017 using county and pollutant specific scaling factors. We then projected on-road emissions to 2050 using projection factors derived from EMFAC2017. All other anthropogenic sources were projected to 2035 using county, pollutant and source category-specific growth factors derived from ARB's California Emissions Projection Analysis Model (CEPAM) 2016 state implementation plan (SIP) inventory. The farthest future year available in the CEPAM is 2035 so the other anthropogenic sources were held constant at 2035 levels in the 2050 inventory. CEPAM estimates emissions for a specific year based on growth and control factors. The growth factors account for county-specific economic activity profiles, population forecasts, and other socio/demographic activity. The control factors reflect the effects of adopted emission control rules.

The most commonly used prognostic meteorological models to provide meteorological fields for air quality modeling are the WRF model (Skamarock et al., 2005) and the Fifth-Generation Mesoscale Model (MM5; Grell et al, 1994). MM5, a nonhydrostatic, prognostic meteorological model developed in the 1970s by Pennsylvania State University and the National Center for Atmospheric Research (NCAR), has been widely used for urban- and regional-scale photochemical, fine particulate, and regional haze regulatory modeling studies. However, development of MM5 ceased in 2006 and WRF has become the new standard model for regulatory air quality applications in the US. WRF was jointly developed by NCAR and the National Center for Environmental Prediction in late 1990s. It has been under continuous development, improvement, testing and open peer-review and is used world-wide by hundreds of researchers and practitioners. BAAQMD adopted WRF version 3.8 for the 2012 simulations. For the current application, the meteorology remains unchanged for the future year simulation and BAAQMD WRF 2012 4-km model outputs were processed using the WRFCAMx[33] processor to generate the meteorological fields ready for CAMx. The WRF model employs a terrain-following coordinate system defined by pressure, using multiple layers that extend from the surface to 50 millibars (approximately 19 kilometers above ground level [AGL]). A layer averaging scheme is adopted for CAMx simulations to reduce the computational burden. Table 2-1 presents the mapping from the WRF vertical layer structure to the CAMx vertical layers.

[32] http://www.camx.com/download/support-software.aspx.

[33] WRFCAMx is available on the CAMx website (http://www.camx.com/download/support-software.aspx)

Table 2-1 Vertical layer structure for WRF and CAMx modeling.

WRF		CAMx			
Layer	Height (m)	Layer	Height (m)	Thickness (m)	Sigma[a]
50	19260	28	19260	2625	0.0000
49	16635				
48	14423				
47	12436	27	12436	1849	0.1339
46	10587				
45	9234				
44	8100	26	8100	960	0.3119
43	7140				
42	6324				
41	5629	25	5629	594	0.4630
40	5034				
39	4524				
38	4086	24	4086	376	0.5806
37	3710				
36	3387				
35	3097	23	3097	261	0.6668
34	2835				
33	2600				
32	2389	22	2389	191	0.7341
31	2198				
30	2028				
29	1873	21	1873	139	0.7863
28	1735				
27	1609				
26	1497	20	1497	102	0.8261
25	1396				
24	1304	19	1304	87	0.8471
23	1217				
22	1133	18	1133	81	0.8661
21	1052				
20	974	17	974	75	0.8840
19	899				
18	827				
17	758	16	758	66	0.9088
16	692	15	692	64	0.9165
15	628				
14	566	14	566	59	0.9312
13	507	13	507	57	0.9382
12	450	12	450	53	0.9450
11	398	11	398	50	0.9513
10	348	10	348	46	0.9573
9	302	9	302	44	0.9629
8	258	8	258	40	0.9682
7	218	7	218	38	0.9731
6	180	6	180	36	0.9777
5	144	5	144	32	0.9821
4	112	4	112	31	0.9861
3	81	3	81	29	0.9899
2	52	2	52	27	0.9935
1	25	1	25	25	0.9969
0	0	0	0	0	1.0000

[a] The sigma vertical coordinate system is used to simplify the equations solved by atmospheric models and is defined as sigma = $(p-p_T)/(p_S - p_T)$ where p is pressure and the subscripts T and S stand for the top and surface values of the model atmosphere, respectively.

The lateral boundary conditions (BCs) for the 4-km state-wide modeling grid were extracted from a global model simulation for the year 2012. The Model for Ozone and Related Chemical Tracers Version 4 (MOZART-4; Emmons et al., 2010) is a global chemical transport model developed jointly by NCAR, the Geophysical Fluid Dynamics Laboratory, and the Max Planck Institute for Meteorology. It simulates chemistry and transport of tropospheric gases and bulk aerosols. The MOZART-4 simulation with updated meteorological fields derived from the National Aeronautics and Space Administration's Goddard Earth Observing System Model Version 5 (GEOS-5)[34] were downloaded from the UCAR website[35] and the MOZART2CAMx processor was used to derive both the boundary and the initial conditions for the modeling. Five days of spin-up periods were used for the 4-km grids to minimize the influence of the initial conditions.

Additional data used in the air quality modeling include ozone column data from the Ozone Monitoring Instrument (OMI) which continues the Total Ozone Mapping Spectrometer (TOMS) record for total ozone and other atmospheric parameters related to ozone chemistry (OMI officially replaced the TOMS ozone column satellite data on January 1, 2006). OMI data are available every 24-hours and are obtained from the TOMS ftp site.[36] The CAMx O3MAP program reads the OMI ozone column text file data and interpolates to fill gaps and generated gridded daily ozone column input data. The OMI data is used in the CAMx (TUV) radiation models which is a radiative transfer model that develops clear-sky photolysis rate inputs for CAMx. The landuse file was generated with the WRFCAMx processor and modified to remove lakes and set coastal waters with a surf zone width of 50 m, this file was used to update the emissions database and provide more realistic representation of sea salt emissions.

Table 2-2 presents the CAMx configuration used for the modeling in this Project analysis. SAPRC07TC (Carter, 2010) is the chemistry mechanism used for California SIPs was used here. It includes additional model species to explicitly represent selected toxics and reactive organic compounds and uses numerical expressions of rate constants that are compatible with the current chemistry mechanism solver. The partitioning of inorganic aerosol constituents (sulfate, nitrate ammonium and chloride) between gas and aerosol phases is performed using the ISORROPIA module. The SOAP semi-volatile equilibrium scheme performs the organic aerosol-gas partitioning. These processes are described in more detailed in the CAMx user guide.

[34] http://www.acd.ucar.edu/wrf-chem/mozart.shtml

[35] https://www.acom.ucar.edu/wrf-chem/mozart.shtml

[36] ftp://toms.gsfc.nasa.gov/pub/omi/data/

Table 2-2. CAMx modeling configuration.

Science Option	Configuration	Notes
Model Code	CAMx v6.5	Released April 2018
Horizontal Grid	4-km 1-way nesting	
O3 and PM 4-km	185 x 185 grid cells	
Vertical Grid	28 vertical layers extending up to ~19 km AGL	Collapsed from 50 WRF/MM5 layers (see Table 3-1)
Initial Conditions	Extracted from the MOZART global model outputs	5-day spin-up for 4-km domain
Boundary Conditions	Extracted from the MOZART global model outputs	Boundary concentration set for 4-km domain extracted using MOZART2CAMx
Photolysis Rate	Photolysis rates lookup table	Derived from satellite measurements and TUV processor
Gas-phase Chemistry	SAPRC07TC	Solved by the Euler Backward Iterative (EBI) solver
Aerosol-phase Chemistry	ISORROPIA (inorganic aerosol) SOAP v2.1 (organic aerosol)	
Meteorological Input Preprocessor	WRFCAMx v4.7	
Advection	Piecewise Parabolic Method (PPM)	
Diffusion	Eddy diffusion algorithm	

2.2 Model Results

The future modeling scenario was simulated using the CAMx source apportionment technology. Both cumulative concentrations from all the sources and the concentrations from Project-specific emissions are derived from a single simulation following the previous section model configuration. The model results of hourly $PM_{2.5}$ concentrations were processed into aggregated metrics that are relevant to health effects.

The metrics relevant to the $PM_{2.5}$ health effects selected in this study are 24-hour annual average concentrations (see Attachment C).

Figure 2-1 shows spatial plots of annual average and a single day episode maximum 24-hour average $PM_{2.5}$ concentrations from the base case. In the base case, the central valley of California shows annual $PM_{2.5}$ concentrations that range between 8 and 20 $\mu g/m^3$. Isolated regions in San Bernardino and Los Angeles counties could reach up to 36 $\mu g/m^3$. The largest increases in $PM_{2.5}$ concentrations from the Project occur over the grid cell where the Project is located, followed by the immediately adjacent grid cells. Contributions of the Project emissions to annual average $PM_{2.5}$ are 0.039 $\mu g/m^3$ at the most affected areas and represent a 0.4 percent increase over the base case concentrations at that location. Contributions to the maximum 24-hour average are 0.118 $\mu g/m^3$ at the most affected area and represent a

0.4 percent increase over the base case concentrations at that location. Figure 2-2 presents increases in quarterly average and maximum 24-hour average $PM_{2.5}$ due to the Project by $PM_{2.5}$ component at the grid cell of maximum concentration change. It confirms that the $PM_{2.5}$ increases due to the Project are mostly due to primary PM components (the sum of "other", EC and POA in the chart).

Figure 2-1. Results of the 4 km $PM_{2.5}$ Modeling Domain

$PM_{2.5}$ Concentrations from the Base Case Scenario (left panels); Increases in $PM_{2.5}$ due to the Project (center panel is modeling domain and right panel is local project area); Annual Averages (top panels); Maximum 24-hour Averages (bottom panels)

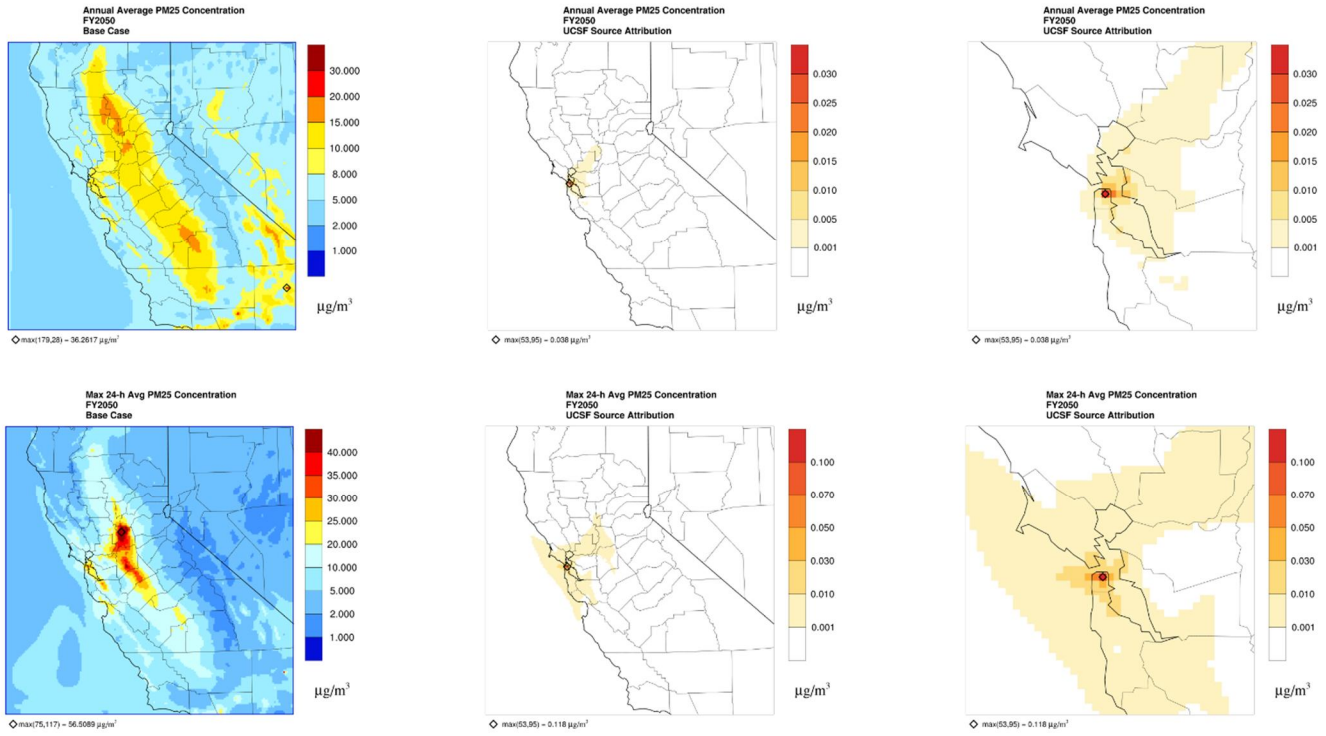
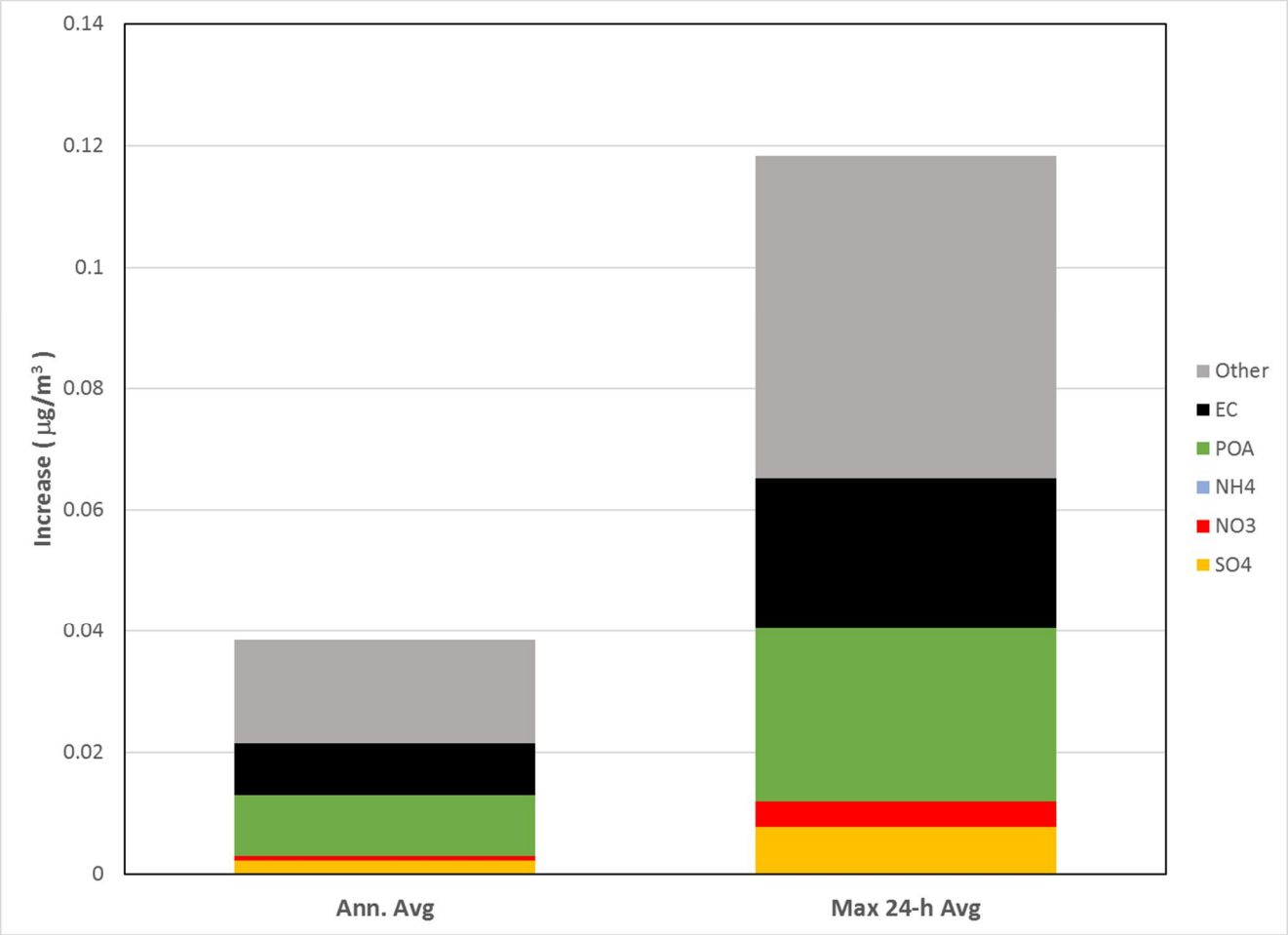


Figure 2-2. Increases in Annual Average and Episode Maximum 24-hour Average $PM_{2.5}$ Concentrations due to the Project by $PM_{2.5}$ Component: fine particulate sulfate (SO_4), nitrate (NO_3), ammonium (NH_4), primary organic aerosol (POA), elemental carbon (EC), and other primary PM (Other); Where the Maximum Change due to Project Emissions Occurred



The metrics relevant to the ozone health effects selected in this study are consistent with the ozone NAAQS (see Attachment C). The model provides hourly concentrations that are further post-processed to produce maximum daily average 8-hour (MDA8) ozone concentrations for each day.

Figure 2-3 displays spatial plots of the annual average MDA8 ozone for the 2050 emissions scenario and the corresponding annual average MDA8 increases to ozone concentrations due to the Project emissions. In the base case, counties located in the south-eastern portion of the domain (San Bernardino, Inyo, Tulare, Kern) show the highest MDA8 annual average ozone concentration between 45 and 50 ppb with isolated regions in Kern county with up to 53 ppb. The maximum increase in the annual average MDA8 ozone concentrations due to the

Project is 0.003 ppb and occurs in Yolo county where it represents a 0.007 percent increase over the base case concentrations.

Figure 2-4 displays MDA8 ozone for the base case and increases in MDA8 ozone due to the project on August 9 of the simulation year, the day that the Project has the highest ozone contribution, which is reasonable given that this occurs in the middle of the summer when higher temperatures and increased solar radiation favour the formation of ozone. The highest MDA8 ozone contribution due to the Project is 0.019 ppb (Figure 2-4, right) that occurs in Contra Costa county where it represents a 0.03 percent increase over the base case concentrations.

Figure 2-3. Annual Average MDA8 Ozone Concentrations from the Base Case Scenario (left) and Increases in Highest MDA8 Ozone Concentrations due to the Project (center for modeling domain and right for local project area) for the Annual Modeling of the 2050 Emissions Scenario

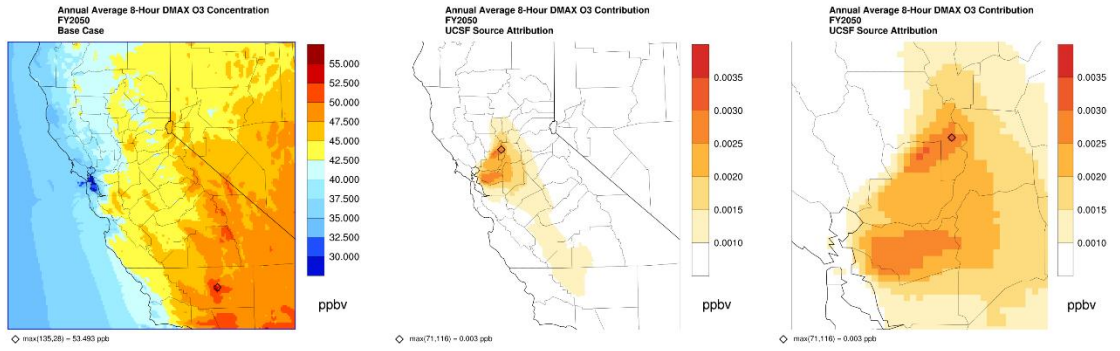
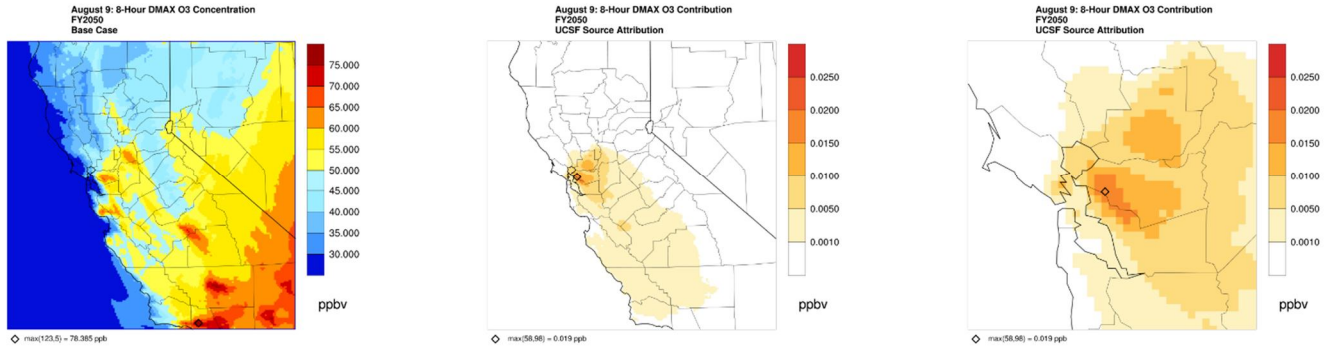


Figure 2-4. MDA8 Ozone Concentrations from the Base Case Scenario (left) and Increases in MDA8 Ozone Concentrations due to the Project (center for modeling domain and right for local project area) on August 9th, the Day with the Highest Project Ozone Contributions for the Annual Modeling of the 2050 Emissions Scenario



2.3 PGM Uncertainty

PGMs generally represent the state-of-the-science when the treatment of photochemically formed air pollution is required over multiple spatial scales (e.g., from single-source to continental). PGMs are part of a modeling system in which there are several other major components that determine model performance, including meteorology, emissions inventories (including background), and chemical mechanisms. It is important to note that both the meteorological models that inform the PGMs and PGM predictions, themselves, in accordance with EPA guidance, are compared with available observations through multiple statistical metrics to characterize any biases and errors.

One of the largest sources of uncertainty for PGM is the processing and accurate accounting of all emission sources into the model. PGMs are Eulerian models that require gridded data that vary in space and time. An accurate prediction of secondary formed pollutants, like ozone and secondary $PM_{2.5}$, requires a comprehensive accounting of all possible sources of pollution and not only those specific to a Project. This typically requires a significant level of effort to construct spatially and temporally varying emission inventories where there may be uncertainties in the characterization of emissions.

A second source of uncertainty is introduced by the meteorological inputs. PGMs require gridded meteorological inputs that are typically provided by mesoscale meteorological model (e.g., WRF) that provide three-dimensional characterization of winds, temperature, humidity and other meteorological variables.

An additional source of uncertainty pertains to the PGM formulations themselves. For example, the models' chemical mechanism represents a simplification of the thousands of chemical reactions involving hundreds of species that take place in the atmosphere in order to reduce the computational burden. PGM being state-of-the-science can only reflect what is understood or established on any given aspect: chemistry, transport, aerosol formation, etc. As the science advances and certain processes are better understood, the models' formulations are modified with the expectation to improve their predictions.

Despite these complexities and associated uncertainties, the USEPA recommends using PGM's for a variety of applications including State Implementation Plans and Regional Haze Planning, and CAMx/CMAQ specifically for single-source modeling of ozone and secondary $PM_{2.5}$. The USEPA believes that the relative change in the PGM-predicted concentrations (e.g., the incremental changes due to the emissions from a single-source) is more accurate and reliable than the total predicted concentrations (USEPA, 2018).

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ATTACHMENT C
BENMAP AND HEALTH EFFECTS

1. HEALTH EFFECTS ANALYSIS

The potential health effects of ozone and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) concentrations due to the Project's emissions were estimated using the Environmental Benefits Mapping and Analysis Program (BenMAP), Community Edition v1.4 (July 2018).[37] BenMAP, developed by the United States Environmental Protection Agency (USEPA), is a powerful and flexible tool that helps users estimate human health effects and economic benefits resulted from changes in air quality. BenMAP outputs include PM- and ozone-related health endpoints such as premature mortality, hospital admissions, and emergency room visits. BenMAP uses the following simplified formula to relate changes in ambient air pollution to certain health endpoints (USEPA, 2018)[38]:

$$\text{Health Effect} = \text{Air Quality Change} \times \text{Health Effect Estimate} \times \text{Exposed Population} \times \text{Background Health Incidence Rate}$$

- Air Quality Change - The difference between the starting air pollution level (the base) and the air pollution level after some change, such as a new source.
- Health Effect Estimate - An estimate of the percentage change in an adverse health effect due to a one unit change in ambient air pollution. Effect estimates, also referred to as concentration-response (C-R) functions, are obtained from epidemiological studies.
- Exposed Population - The number of people affected by the air quality change. The government census office is a good source for this information. This analysis uses data from PopGrid, which is an add-on program to BenMAP that allocates the block-level U.S. Census population to a user-defined grid.[39]
- Background Health Incidence Rate - An estimate of the average number of people over a given population that suffer from some adverse health effect over a given period of time. For example, the health incidence for mortality is the number of people over a given population who might die in a given year. Health incidence rates and other health data are typically collected by the government as well as the World Health Organization. BenMAP calculates background health incidence rates based on the available health statistics and population data, with preference given to individual-level data counts (e.g., mortality counts or hospital and emergency department discharges) at the County-level. For California counties, data were available at the individual-level. The background health incidence data are also based on different years depending on data availability. For example, hospital admissions and emergency department visits for California are based on 2011 data. For mortality background incidence rates, USEPA obtained data for 2012-2014 from the Centers for Disease Control WONDER database (http://wonder.cdc.gov) and generated age-, cause-, and county-specific mortality rates as described in the BenMAP manual.36 The projected mortality rates for the years 2015-2050 are then calculated using Census Bureau projected life tables.[40]

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[37] http://www.epa.gov/air/benmap/

[38] The common function used for calculating health impacts is the following log-linear function: Health Effect = Background Health Incidence Rate x [1 – exponential (Health Effect Estimate * Air Quality Change)] x Exposed Population

[39] https://www.epa.gov/sites/production/files/2015-04/documents/benmap-ce_user_manual_march_2015.pdf

[40] https://www.census.gov/programs-surveys/popproj/data/tables.html

The health endpoints analyzed in this study and the BenMAP results are presented in Section 2 of this attachment.

2. HEALTH EFFECTS ANALYSIS RESULTS

This section presents the health effects of the Project emissions on the population in the northern California domain, estimated by the BenMAP model. The Comprehensive Air Quality Model with extensions (CAMx) modeling results are processed to generate aggregated daily and annual average $PM_{2.5}$ and maximum daily 8-hour ozone concentrations appropriate for various health endpoints. The CAMx simulation results from the full year (January to December) are used to estimate the health effects of $PM_{2.5}$ and ozone. BenMAP translates increases in the pollutant concentration due to the Project emissions to changes in the incidence rate for each health effect using a C-R function derived from previously published epidemiological studies. BenMAP often provides multiple C-R functions based on different epidemiological studies for a given health endpoint. We used the C-R functions used in past USEPA regulatory assessments when evaluating health effects, together with a more refined population data. This analysis uses population data from PopGrid, which allocates the census population to each modeled 4x4 kilometer (km) grid cell.

The population used for both the quantified health effects and the background health incidence presented here is future year 2050. The PopGrid program was used to project 2010 block-level U.S. Census population to 2050. BenMAP reads this file to incorporate population changes into its health effect calculations. The population in the Northern California domain is projected to be 24,961,329 in 2050.

2.1 $PM_{2.5}$ Health Effects

Consistent with USEPA's assessment of health effects of particulate matter, our health effects evaluation focuses on $PM_{2.5}$ and not PM_{10}, as $PM_{2.5}$ has a much larger body of evidence that this size fraction is associated with health effects due to the sources, composition, chemical properties and lifetime in the atmosphere (USEPA 2009). $PM_{2.5}$ is capable of penetrating deeper into the lungs because of their size compared to larger particles and this is believed to contribute to greater health effects. Consistent with USEPA health effects evaluations, the health effect functions in BenMAP for PM use fine particulate ($PM_{2.5}$) as the causal PM agent.

Although there are a large number of potential health endpoints that could be included in the analysis as described above, we selected the key health endpoints that have been the focus of recent United States Environmental Protection Agency (USEPA) risk assessments (e.g., USEPA, 2010; USEPA, 2014). For example, the USEPA notes that health endpoints were selected based on consideration of at-risk populations (e.g. asthmatics), endpoints that have public health significance, and endpoints for which information is sufficient to support a quantitative C-R relationship (USEPA, 2014).

The health endpoints and associated C-R functions examined in this study are presented in Table 2-1. Each C-R function is based on a certain age range for the given health endpoint depending on the underlying epidemiological study on which it is based. Increases in the BenMAP-estimated health effect incidences and percent of background health incidence due to the Project emissions are presented in Table 2-2. Mean incidence rates are presented along with 2.5 and 97.5 percentiles to demonstrate the potential range in estimated health effects. These values reflect the total health effects across the Northern California model domain, though the regions of primary health effect results are shown in Figures 2-1 and 2-2 of Attachment B.

Table 2-1. Summary of $PM_{2.5}$ Health Endpoints Used in this Study

Health Endpoint	Age Range	Daily Metric	Seasonal Metric	Annual Metric	C-R Function Selected
Emergency Room Visits, Asthma	0-99	24-hr mean			Mar et al., 2010[1]
Mortality, All Cause	30-99	24-hr mean	Quarterly mean	Mean	Krewski et al., 2009[1]
Hospital Admissions, Asthma	0-64	24-hr mean	-	-	Sheppard, 2003[1]
Hospital Admissions, All Cardiovascular (less Myocardial Infarctions)	65-99	24-hr mean	-	-	Bell, 2008[1]
Hospital Admissions, All Respiratory	65-99	24-hr mean	-	-	Zanobetti et al., 2009[1]
Acute Myocardial Infarction, Nonfatal	18-24	24-hr mean	-	-	Zanobetti et al., 2009[1]
Acute Myocardial Infarction, Nonfatal	25-44	24-hr mean	-	-	
Acute Myocardial Infarction, Nonfatal	45-54	24-hr mean	-	-	
Acute Myocardial Infarction, Nonfatal	55-64	24-hr mean	-	-	
Acute Myocardial Infarction, Nonfatal	65-99	24-hr mean	-	-	

[1] C-R functions available in BenMAP (USEPA, 2018)

The results show that the highest health effect is for all-cause mortality, with an estimated mean increased incidence of 2.36 deaths per year due to the Project emissions. Smaller mean increased incidences per year were estimated for other relevant $PM_{2.5}$-related health effects: 0.99 increase in incidence of asthma related emergency room visits, 0.42 increase in incidence of respiratory hospital admissions, and 0.20 increase in incidence of cardiovascular hospital admissions.

It should be noted, however, that the estimated increased incidence in those health effects are quite minor compared to the background health incidence values (shown in Table 2-2 as percent of Background Health Incidence). For example, for mortality, the increase of 2.36 deaths per year due to Project emissions represents 0.00072% of the total all-cause mortality for people ages 30 to 99.

Table 2-2. BenMAP-Estimated $PM_{2.5}$ Annual Health Effects of the Project Emissions Across the Northern California Model Domain[1]

Health Endpoint[2]	Project Incidences (Annual)			Background Health Incidence (Annual)	Project Mean as Percent of Background Health Incidence[4] (%)
	2.5 Percentile[3]	Mean	97.5 Percentile[3]		
Emergency Room Visits, Asthma [0-99]	0.26	0.99	1.71	126,657	0.00078%
Mortality, All Cause [30-99]	1.59	2.36	3.12	327,475	0.00072%
Hospital Admissions, Asthma [0-64]	0.03	0.07	0.11	14,603	0.00049%
Hospital Admissions, All Cardiovascular (less Myocardial Infarctions) [65-99]	0.15	0.20	0.25	180,325	0.00011%
Hospital Admissions, All Respiratory [65-99]	0.24	0.42	0.59	155,122	0.00027%
Acute Myocardial Infarction, Nonfatal [18-24]	0.000045	0.000094	0.00014	32	0.00030%
Acute Myocardial Infarction, Nonfatal [25-44]	0.0032	0.0065	0.010	1,657	0.00039%
Acute Myocardial Infarction, Nonfatal [45-54]	0.0075	0.015	0.023	4,260	0.00036%
Acute Myocardial Infarction, Nonfatal [55-64]	0.014	0.029	0.044	8,464	0.00034%
Acute Myocardial Infarction, Nonfatal [65-99]	0.053	0.110	0.17	33,946	0.00032%

[1] Health effects are shown terms of incidences of each health endpoint and how it compares to the base (2050 base year health effect incidences) values.

[2] Affected age ranges are shown in square brackets.

[3] The percentiles are generated in BenMAP using a Monte Carlo analysis and represent the statistical uncertainty in the incidence associated with the CRF, but do not include other potential sources of uncertainty (i.e., in the air modeling, in estimates of projected background incidence or populations). These confidence bounds are typically used by USEPA to represent the 95% confidence intervals around the mean estimate.

[4] The percent of background health incidence uses the mean incidence.

2.2 Ozone Health Effects

As noted above, although a larger number of health endpoints could be evaluated, we selected the health endpoints based on recent USEPA risk assessments (USEPA, 2010; USEPA, 2014). The health endpoints and associated C-R functions examined in this study are presented in Table 2-3. Each C-R function is associated with a certain age range for the given health endpoint depending on the epidemiological study on which it is based. Increases in the BenMAP-estimated health effect incidences and percent of background health incidence due to the Project emissions are presented in Table 2-4. Mean incidence rates are presented along with 2.5 and 97.5 percentiles to demonstrate the potential range in estimated health effects. These values reflect the total health effects across the Northern California model domain, though the regions of primary health effect results are shown in Figures 2-3 and 2-4 of Attachment B.

Table 2-3. Summary of Ozone Health Endpoints Used in this Study.

Health Endpoint	Age Range	Daily Metric	Seasonal Metric	Annual Metric	C-R Function Selected
Hospital Admissions, All Respiratory	65 - 99	MDA8	-	-	Katsouyanni et al., 2009[1]
Mortality, Non-Accidental	0 - 99	MDA8	-	-	Smith et al., 2009[1]
Emergency Room Visits, Asthma	0 - 17	MDA8	-	-	Mar and Koenig, 2009[1]
Emergency Room Visits, Asthma	18 - 99	MDA8	-	-	Mar and Koenig, 2009[1]

[1] C-R functions available in BenMAP (USEPA, 2018)

For this Project, asthma-related emergency room visits are associated with the highest health effects due to the Project emissions in the northern California domain (0.76 incidences per year for adults ages 18 to 99 and 0.47 incidences per year for children ages 0 to 17). Hospital admissions due to respiratory issues for adults age 65-99 and non-accidental mortality have lower incidence increases (0.10 and 0.055 incidences per year, respectively).

The estimated increases in those health effect incidences are quite minor compared to the background health incidence (shown in Table 2-4 as percent of Background Health Incidence). For example, the increase in asthma emergency room visits represents 0.0011% of the total asthma-related emergency room visits for children.

Table 2-4. BenMAP-Estimated Mean Ozone Annual Health Effects of the Project Emissions Across the Northern California Model Domain[1]

Health Endpoint[2]	Project Incidences (Annual)			Background Health Incidence (Annual)	Project Mean as Percent of Background Health Incidence[4] (%)
	2.5 Percentile[3]	Mean	97.5 Percentile[3]		
Hospital Admissions, All Respiratory [65-99]	-0.024	0.10	0.23	155,122	0.000066%

Mortality, Non-Accidental [0-99]	-0.015	0.055	0.13	204,688	0.000027%
Emergency Room Visits, Asthma [0-17]	0.084	0.47	0.85	41,194	0.0011%
Emergency Room Visits, Asthma [18-99]	0.21	0.76	1.31	85,464	0.00089%

[1] Health effects are shown terms of incidences of each health endpoint and how it compares to the base (2050 base year health effect incidences) values.

[2] Affected age ranges are shown in square brackets.

[3]The percentiles are generated in BenMAP using a Monte Carlo analysis and represent the statistical uncertainty in the incidence associated with the CRF, but do not include other potential sources of uncertainty (i.e., in the air modeling, in estimates of projected background incidence or populations). These confidence bounds are typically used by USEPA to represent the 95% confidence intervals around the mean estimate.

[4] The percent of background health incidence uses the mean incidence.

2.3 Initial Phase Projects Health Effects [Irving Street Arrival, Research and Academic Building, and Initial Aldea Housing Densification]

The potential health effects from the emissions associated with the Initial Phase Projects can be generally characterized using the full Project level modeling results and a comparison of total emissions. This is because the types and general spatial allocation of emissions is similar between the Initial Phase Projects and the full Project buildout. Emissions from the Initial Phase Projects would also be subject to similar meteorological and photochemical reaction conditions as the full Project assessment. Additionally, the exposed population at full buildout in 2050 is greater than the exposed population in 2030 with Initial Phase Projects and therefore linearly scaling full Project buildout health effects to estimate Initial Phase Projects health effects is conservative.

Concentrations changes, and thus health effects, from $PM_{2.5}$ are driven by primary $PM_{2.5}$ emissions (see Attachment B), with smaller contributions from NOx, VOC, and SO_2 resulting in secondary $PM_{2.5}$ formation. Based on a ratio of total $PM_{2.5}$ emissions from the full Project to Initial Phase Projects $PM_{2.5}$ emissions, approximate health effect results from $PM_{2.5}$ for the Initial Phase Projects would be approximately 80% lower than those from the full Project buildout.

Concentration changes, and thus health effects, from ozone are driven primarily by emissions of VOC and NOx, with some contribution from CO. Based on a ratio of total VOC and NOx emissions from the full Project to Initial Phase Projects VOC and NOx emissions, approximate health effect results from ozone for the Initial Phase Projects would be approximately 80% lower than those from the full Project buildout.

2.4 Construction Health Effects [Initial Phase Projects and the New Hospital]

As maximum daily emissions associated with construction activity are a fraction of incremental 2050 emissions evaluated under the full Project buildout, any potential health effects resulting from such construction activity would be less than what has been modeled for the full Project buildout.

2.5 Conclusion

The $PM_{2.5}$ and ozone concentration changes modeled by CAMx were converted to potential health effects on various health endpoints including premature mortality, hospitalizations, and emergency room visits, using the BenMAP health effects assessment model and health endpoints typically used in past USEPA regulatory assessments. Estimated changes in the annual health effect incidences are presented across the California grids in the northern California domain. Across the board, the estimated increases in those health effect incidences are quite minor compared to the background health incidence values with the largest $PM_{2.5}$ health effect (all-cause mortality) from the Project (2050 build out) representing 0.00072% of the total of all deaths, and the largest health effect for ozone (asthma related emergency room visits by adults) representing 0.00089% of all emergency room visits. The estimated increase in health effect incidences for the Initial Phase Projects (2030) would be approximately 80% lower the those from the full Project. Similarly, any potential health effects from construction activity would be lower than what has been modeled for the full Project buildout.

Project-related health incidences occur both in closer proximity to Project emissions, particularly for $PM_{2.5}$ health effects (see Attachment B for maps of modeled concentration changes), or over a large area due to the regional nature of emission dispersion and photochemical reactions that occur, particularly for ozone health effects (concentration changes also shown in Attachment B). When taken into context, the small increase in incidences and the small percent of the number of background incidences indicate that these health effects are minimal in a developed environment.

2.5.1 Uncertainty

The approach and methodology of this analysis ensures that the uncertainty is of a conservative nature. In addition to the conservative assumptions built into the emissions noted above, there are a number of assumptions built into the application of C-R functions in BenMAP that may lead to an overestimation of health effects. For example, for all-cause mortality health effects from $PM_{2.5}$, these estimates are based on a single epidemiological study that found an association between $PM_{2.5}$ concentrations and mortality. While similar studies suggest that such an association exists, there remains uncertainty regarding a clear causal link. This uncertainty stems from the limitations of epidemiological studies, such as inadequate exposure estimates and the inability to control for many factors that could explain the association between $PM_{2.5}$ and mortality such as lifestyle factors like smoking or exposures to other air pollutants. Several reviews have evaluated the scientific evidence of health effects from specific particulate components (e.g., Rohr and Wyzga 2012; Lippmann and Chen, 2009; Kelly and Fussell, 2007). These reviews indicate that the evidence is strongest for combustion-derived components of PM including elemental carbon (EC), organic carbon (OC) and various metals (e.g., nickel and vanadium), however, there is still no definitive data that points to any particular component of PM as being more toxic than other components. The USEPA has also stated that results from various studies have shown the importance of considering particle size, composition, and particle source in determining the health effects of PM (USEPA, 2009). Further, USEPA (2009) found that studies have reported that particles from industrial sources and from coal combustion appear to be the most significant contributors to PM-related mortality, consistent with the findings by Rohr and Wyzga (2012) and others. This is particularly important to note here, as the majority of PM emissions generated from the Project are from brakewear, tirewear, and entrained roadway dust (see Attachment A), and not from combustion. Therefore, by not considering the relative toxicity of PM components, the results presented here are conservative.

Another uncertainty highlighted by the USEPA (2012) which applies to potential health effects from both $PM_{2.5}$ and ozone, is the assumption of a log-linear response between exposure and health effects, without consideration for a threshold concentration below which effects may not be measurable. The issue of a threshold for $PM_{2.5}$ and ozone is highly debated and can have significant implications for health effects analyses as it requires consideration of current air pollution levels and calculating effects only for areas that exceed threshold levels. Without consideration of a threshold concentration, any changes in air pollution are assumed to adversely affect health. Although the USEPA traditionally does not consider thresholds in its cost-benefit analyses, the NAAQS itself is a health-based threshold level that the USEPA has developed based on evaluating the most current evidence of health effects.

For both the $PM_{2.5}$ and ozone health effects calculated, each of the pollutants may be a confounder of the other. Thus, while the C-R functions are from studies that evaluated the effects for each pollutant individually, both air pollutants could contribute to the health effect outcomes evaluated, and thus the overall health effects may be overstated.

As noted above, the health effects estimation using this method presumes that effects seen at large concentration differences can be linearly scaled down to small increases in concentration, with no consideration of potential thresholds below which health effects may not occur. This methodology of linearly scaling health effects is broadly accepted for use in regulatory evaluations and is considered as being health protective (USEPA, 2010). In summary, health effects presented in this report are conservatively estimated, and the actual effects may be zero.

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Appendix NOI
Noise and Vibration Appendix

RCNM Outputs for Construction Noise

Traffic Noise Model

HUD DNL Noise Model

Noise Level Monitoring Data

RCNM Outputs for Construction Noise

Aldea Construction
Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2019
Case Description: Aldea Construction

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
90 Behr Avenue	Residential	69.0	69.0	60.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	70.0	0.0
Gradall	No	40		83.4	70.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Calculated (dBA)				Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	77.6	69.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	80.5	76.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	80.5	77.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Aldea Demo
Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2019
Case Description: Aldea demolition

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
90 Behr Avenue	Residential	69.0	69.0	60.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	70.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	70.0	0.0

Results

Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
	Calculated (dBA)				Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Backhoe	74.6	70.7			N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	87.4	80.4			N/A	N/A	N/A	N/A	N/A	N/A
Total	87.4	80.8			N/A	N/A	N/A	N/A	N/A	N/A

Aldea Demo

N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Irving Street Construction
Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2019
Case Description: Irving Street Construction

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
30 Irving Street	Residential	69.0	69.0	60.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	70.0	0.0
Gradall	No	40		83.4	70.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Crane	77.6	69.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	80.5	76.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	80.5	77.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Irving Street Demo
Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2019
Case Description: Irving Street demolition

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
30 Irving Street	Residential	69.0	69.0	60.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	70.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	70.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Backhoe	74.6	70.7					N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	87.4	80.4					N/A	N/A	N/A	N/A	N/A	N/A
Total	87.4	80.8					N/A	N/A	N/A	N/A	N/A	N/A

N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

RAB Construction
Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2019
Case Description: RAB Construction

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
650 Parnassus	Residential	64.0	64.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	75.0	0.0
Gradall	No	40		83.4	75.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Crane	77.0	69.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Gradall	79.9	75.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	79.9	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

RAB Demo
Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 10/24/2019
Case Description: RAB demolition

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
650 Parnassus	Residential	63.0	63.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Backhoe	No	40		77.6	75.0	0.0
Mounted Impact Hammer (hoe ram)	Yes	20		90.3	75.0	0.0

Results

Noise Limits (dBA)

Noise Limit Exceedance (dBA)

Equipment	Calculated (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Backhoe	74.0	70.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mounted Impact Hammer (hoe ram)	86.8	79.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	86.8	80.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

RAB Demo

N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Traffic Noise Model

Existing

ROAD SEGMENT			TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						NOISE LEVEL (dBA)			CALCULATED NOISE LEVEL 15 meters from	Receptor Dist. from Roadway	Adjusted Noise Level	Distance from Roadway to 65 dBA	Distance from Roadway to 65 dBA
Calveno Peak				Auto		MT		HT		Auto	k/h	MT	k/h	HT	k/h	Auto	MT	HT					
	from:	to:		%	Auto	%	MT	%	HT										roadway center)	Center (m.)	(dBA)	(m.)	(ft)
Kirkham	7th	5th	354	97	343.38	2	7.08	1	3.54	25	40	25	40	25	40	55.5	50.3	54.9	58.8	40	54.6	3.6	11.9
5th	Kirkham	Judah	297	97	288.09	2	5.94	1	2.97	25	40	25	40	25	40	54.7	49.5	54.1	58.1	40	53.8	3.0	10.0
7th	Kirkham	Judah	1043	97	1011.7	2	20.86	1	10.4	25	40	25	40	25	40	60.2	54.9	59.6	63.5	40	59.3	10.7	35.1
Judah	7th	5th	681	95	646.95	3	20.43	2	13.6	25	40	25	40	25	40	58.2	54.9	60.7	63.3	40	59.1	10.2	33.5
Parnassus	5th	3rd	904	95	858.8	3	27.12	2	18.1	25	40	25	40	25	40	59.4	56.1	62.0	64.6	40	60.3	13.6	44.5
Parnassus	3rd	Hillway	878	95	834.1	3	26.34	2	17.6	25	40	25	40	25	40	59.3	56.0	61.8	64.4	40	60.2	13.2	43.2
Parnassus	Hillway	Stanyan	643	95	610.85	3	19.29	2	12.9	25	40	25	40	25	40	58.0	54.6	60.5	63.1	40	58.8	9.6	31.7
Stanyan	Parnassus	Fredrick	713	95	677.35	3	21.39	2	14.3	25	40	25	40	25	40	58.4	55.1	60.9	63.5	40	59.3	10.7	35.1
Irving	Stanyan	Arguello	321	95	304.95	3	9.63	2	6.42	25	40	25	40	25	40	54.9	51.6	57.5	60.1	40	55.8	4.8	15.8
Irving	Arguello	4th	391	95	371.45	3	11.73	2	7.82	25	40	25	40	25	40	55.8	52.4	58.3	60.9	40	56.7	5.9	19.2
Lincoln	Arguello	4th	3776	95	3587.2	3	113.3	2	75.5	35	56	35	56	35	56	69.9	64.6	69.5	73.3	40	69.1	102.0	334.7
Clarendon	Johnstone	Laguna Hnda	683	97	662.51	2	13.66	1	6.83	35	56	35	56	35	56	62.5	55.4	59.1	64.7	40	60.4	14.0	45.8

Assumptions: PM peak hour traffic data from Fehr & Peers

Existing + Project

ROAD SEGMENT			TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						NOISE LEVEL (dBA)			CALCULATED NOISE LEVEL 15 meters from	Receptor Dist. from Roadway	Adjusted Noise Level	Distance from Roadway to 65 dBA	Distance from Roadway to 65 dBA
Calveno Peak				Auto		MT		HT		Auto	k/h	MT	k/h	HT	k/h	Auto	MT	HT					
	from:			%	Auto	%	MT	%	HT										roadway center)	Center (m.)	(dBA)	(m.)	(ft)
Kirkham	7th	5th	517	97	501.49	2	10.34	1	5.17	25	40	25	40	25	40	57.1	51.9	56.5	60.5	40	56.2	5.3	17.4
5th	Kirkham	Judah	342	97	331.74	2	6.84	1	3.42	25	40	25	40	25	40	55.3	50.1	54.7	58.7	40	54.4	3.5	11.5
7th	Kirkham	Judah	1424	97	1381.3	2	28.48	1	14.2	25	40	25	40	25	40	61.5	56.3	60.9	64.9	40	60.6	14.6	47.9
Judah	7th	5th	1055	95	1002.3	3	31.65	2	21.1	25	40	25	40	25	40	60.1	56.8	62.6	65.2	40	61.0	15.8	51.9
Parnassus	5th	3rd	1355	95	1287.3	3	40.65	2	27.1	25	40	25	40	25	40	61.2	57.8	63.7	66.3	40	62.1	20.3	66.7
Parnassus	3rd	Hillway	1437	95	1365.2	3	43.11	2	28.7	25	40	25	40	25	40	61.5	58.1	64.0	66.6	40	62.3	21.6	70.7
Parnassus	Hillway	Stanyan	957	95	909.15	3	28.71	2	19.1	25	40	25	40	25	40	59.7	56.3	62.2	64.8	40	60.6	14.4	47.1
Stanyan	Parnassus	Fredrick	966	95	917.7	3	28.98	2	19.3	25	40	25	40	25	40	59.7	56.4	62.3	64.9	40	60.6	14.5	47.6
Irving	Stanyan	Arguello	403	95	382.85	3	12.09	2	8.06	25	40	25	40	25	40	55.9	52.6	58.5	61.1	40	56.8	6.0	19.8
Irving	Arguello	4th	589	95	559.55	3	17.67	2	11.8	25	40	25	40	25	40	57.6	54.2	60.1	62.7	40	58.4	8.8	29.0
Lincoln	Arguello	4th	4131	95	3924.5	3	123.9	2	82.6	35	56	35	56	35	56	70.2	65.0	69.9	73.7	40	69.5	111.6	366.2
Clarendon	Johnstone	Laguna Hnda	748	97	725.56	2	14.96	1	7.48	35	56	35	56	35	56	62.9	55.8	59.5	65.1	40	60.8	15.3	50.2

Assumptions: PM peak hour traffic data from Fehr & Peers

Cumulative + Project

ROAD SEGMENT			TOTAL # VEHICLES	VEHICLE TYPE %						VEHICLE SPEED						NOISE LEVEL (dBA)			CALCULATED NOISE LEVEL 15 meters from	Receptor Dist. from Roadway	Adjusted Noise Level	Distance from Roadway to 65 dBA	Distance from Roadway to 65 dBA
Calveno Peak				Auto		MT		HT		Auto	k/h	MT	k/h	HT	k/h	Auto	MT	HT					
	from:			%	Auto	%	MT	%	HT										roadway center)	Center (m.)	(dBA)	(m.)	(ft)
Kirkham	7th	5th	650	97	630.5	2	13	1	6.5	25	40	25	40	25	40	58.1	52.9	57.5	61.5	40	57.2	6.7	21.9
5th	Kirkham	Judah	392	97	380.24	2	7.84	1	3.92	25	40	25	40	25	40	55.9	50.7	55.3	59.3	40	55.0	4.0	13.2
7th	Kirkham	Judah	1,494	97	1449.2	2	29.88	1	14.9	25	40	25	40	25	40	61.7	56.5	61.1	65.1	40	60.8	15.3	50.3
Judah	7th	5th	1,121	95	1065	3	33.63	2	22.4	25	40	25	40	25	40	60.4	57.0	62.9	65.5	40	61.2	16.8	55.2
Parnassus	5th	3rd	1,436	95	1364.2	3	43.08	2	28.7	25	40	25	40	25	40	61.4	58.1	64.0	66.6	40	62.3	21.5	70.7
Parnassus	3rd	Hillway	1,528	95	1451.6	3	45.84	2	30.6	25	40	25	40	25	40	61.7	58.4	64.3	66.8	40	62.6	22.9	75.2
Parnassus	Hillway	Stanyan	1,037	95	985.15	3	31.11	2	20.7	25	40	25	40	25	40	60.0	56.7	62.6	65.2	40	60.9	15.6	51.1
Stanyan	Parnassus	Fredrick	1,000	95	950	3	30	2	20	25	40	25	40	25	40	59.9	56.5	62.4	65.0	40	60.7	15.0	49.2
Irving	Stanyan	Arguello	466	95	442.7	3	13.98	2	9.32	25	40	25	40	25	40	56.6	53.2	59.1	61.7	40	57.4	7.0	22.9
Irving	Arguello	4th	681	95	646.95	3	20.43	2	13.6	25	40	25	40	25	40	58.2	54.9	60.7	63.3	40	59.1	10.2	33.5
Lincoln	Arguello	4th	4,287	95	4072.7	3	128.6	2	85.7	35	56	35	56	35	56	70.4	65.1	70.1	73.9	40	69.6	115.8	380.0
Clarendon	Johnstone	Laguna Hnda	789	97	765.33	2	15.78	1	7.89	35	56	35	56	35	56	63.1	56.0	59.7	65.3	40	61.1	16.1	52.9

Assumptions: PM peak hour traffic data from Fehr & Peers

HUD DNL Noise Model

Site ID	UCSF Parnassus Campus Existing
Record Date	6/4/2020
User's Name	C. Sanchez

Road # 1 Name:	**Medical Center Way Existing**

Road #1

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	180	180	180
Distance to Stop Sign	150	150	150
Average Speed	15	15	15
Average Daily Trips (ADT)	742	201	57
Night Fraction of ADT	15	15	15
Road Gradient (%)			9
Vehicle DNL	32	46	58
Calculate Road #1 DNL	58	Reset	

Add Road Source | Add Rail Source

Airport Noise Level	
Loud Impulse Sounds?	○**Yes** ○**No**

Site ID	UCSF Parnassus Campus with CPHP
Record Date	6/4/2020
User's Name	C. Sanchez

Road # 1 Name:	**Medical Center Way with Project**

Road #1

Vehicle Type	**Cars** ☑	**Medium Trucks** ☑	**Heavy Trucks** ☑
Effective Distance	180	180	180
Distance to Stop Sign	150	150	150
Average Speed	15	15	15
Average Daily Trips (ADT)	890	242	68
Night Fraction of ADT	15	15	15
Road Gradient (%)			9
Vehicle DNL	33	47	58
Calculate Road #1 DNL	59	Reset	

Add Road Source | Add Rail Source

Airport Noise Level	
Loud Impulse Sounds?	○**Yes** ○**No**

Noise Level Monitoring Data

Summary

File Name on Meter	LxT_Data.058
File Name on PC	SLM_0004437_LxT_Data_058.00.ldbin
Serial Number	0004437
Model	SoundTrack LxT®
Firmware Version	2.302
User	C. Sanchez
Location	Aldea Housing
Job Description	UCSF CPHP
Note	

Measurement

Description	
Start	2019-10-17 10:10:19
Stop	2019-10-23 10:28:45
Duration	144:18:26.813
Run Time	144:18:26.813
Pause	00:00:00.0
Pre Calibration	2019-10-17 09:34:07
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT2B
Microphone Correction	Off
Integration Method	Exponential
Overload	142.2 dB

	A	**C**	**Z**	
Under Range Peak	98.5	95.5	**100.5**	dB
Under Range Limit	**47.5**	45.5	53.5	dB
Noise Floor	34.4	35.0	42.6	dB

Results

LA_{Seq}	49.3	dB	
LASE	106.5	dB	
EAS	4.947	mPa^2h	
EAS8	274.237	μPa^2h	
EAS40	1.371	mPa^2h	
$LZ_{Speak\ (max)}$	2019-10-23 10:28:40	110.1	dB
LAS_{max}	2019-10-23 10:08:57	89.5	dB
LAS_{min}	2019-10-18 04:12:59	40.4	dB
SEA	-99.9	dB	

LAS > 85.0 dB (Exceedance Counts / Duration)	3	17.7 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{Speak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{Speak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{Speak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LC_{Seq}	60.0	dB
LA_{Seq}	49.3	dB
LCS_{eq} - LA_{Seq}	10.7	dB
LAI_{eq}	52.0	dB
LA_{eq}	49.3	dB
LAI_{eq} - LA_{eq}	2.7	dB

Record #	Record Type	Date	Time	LASeq	LZpeak	LASmax	LASmin	OVLD	OBA OVLD	Marker
1	Run	2019-10-17	10:10:18							
2		2019-10-17	10:10:19	53.2	106.7	77.2	43.1	No	No	
3		2019-10-17	11:10:19	47.2	92.0	62.6	42.7	No	No	
4		2019-10-17	12:10:19	49.4	96.8	66.2	43.6	No	No	
5		2019-10-17	13:10:19	49.2	91.1	65.0	44.2	No	No	
6		2019-10-17	14:10:19	50.1	108.2	68.2	45.8	No	No	
7		2019-10-17	15:10:19	49.6	92.9	69.3	46.0	No	No	
8		2019-10-17	16:10:19	49.0	93.3	59.8	45.7	No	No	
9		2019-10-17	17:10:19	49.9	96.2	64.8	45.9	No	No	
10		2019-10-17	18:10:19	49.7	91.1	67.5	44.9	No	No	
11		2019-10-17	19:10:19	48.0	89.9	64.0	43.6	No	No	
12		2019-10-17	20:10:19	47.9	86.7	63.4	43.8	No	No	
13		2019-10-17	21:10:19	46.4	86.6	61.8	42.9	No	No	
14		2019-10-17	22:10:19	44.5	86.7	49.1	42.5	No	No	
15		2019-10-17	23:10:19	44.2	83.7	51.0	42.2	No	No	
16		2019-10-18	0:10:19	43.8	79.9	55.0	41.4	No	No	
17		2019-10-18	1:10:19	42.9	82.1	52.0	40.7	No	No	
18		2019-10-18	2:10:19	42.2	79.9	48.8	40.6	No	No	
19		2019-10-18	3:10:19	42.0	86.3	49.0	40.6	No	No	
20		2019-10-18	4:10:19	42.3	78.5	49.3	40.4	No	No	
21		2019-10-18	5:10:19	46.0	92.9	70.4	41.6	No	No	
22		2019-10-18	6:10:19	46.8	94.6	68.8	40.9	No	No	
23		2019-10-18	7:10:19	49.6	89.5	66.9	42.9	No	No	
24		2019-10-18	8:10:19	48.8	92.1	69.8	43.2	No	No	
25		2019-10-18	9:10:19	48.5	90.6	64.6	41.6	No	No	
26		2019-10-18	10:10:19	46.2	91.3	60.6	41.2	No	No	
27		2019-10-18	11:10:19	45.0	85.8	63.2	40.8	No	No	
28		2019-10-18	12:10:19	48.3	92.8	69.4	40.9	No	No	
29		2019-10-18	13:10:19	52.6	89.5	74.7	41.8	No	No	
30		2019-10-18	14:10:19	47.8	91.5	66.2	42.2	No	No	
31		2019-10-18	15:10:19	49.1	90.0	63.5	44.7	No	No	
32		2019-10-18	16:10:19	49.3	94.0	63.7	45.2	No	No	
33		2019-10-18	17:10:19	49.9	89.5	66.0	46.3	No	No	
34		2019-10-18	18:10:19	47.5	91.6	54.6	43.9	No	No	
35		2019-10-18	19:10:19	46.5	94.9	60.4	43.6	No	No	
36		2019-10-18	20:10:19	47.6	90.8	66.2	43.4	No	No	
37		2019-10-18	21:10:19	45.8	87.1	57.6	43.4	No	No	
38		2019-10-18	22:10:19	44.6	83.4	53.1	42.6	No	No	
39		2019-10-18	23:10:19	44.7	85.2	53.2	42.7	No	No	
40		2019-10-19	0:10:19	43.6	84.4	53.0	41.9	No	No	
41		2019-10-19	1:10:19	43.1	80.0	50.5	41.2	No	No	
42		2019-10-19	2:10:19	43.2	82.2	52.7	41.6	No	No	
43		2019-10-19	3:10:19	44.1	85.0	59.2	41.5	No	No	
44		2019-10-19	4:10:19	42.5	74.8	45.3	41.0	No	No	
45		2019-10-19	5:10:19	43.5	79.6	50.5	41.6	No	No	
46		2019-10-19	6:10:19	45.1	80.9	58.8	42.1	No	No	
47		2019-10-19	7:10:19	48.3	84.5	64.3	42.2	No	No	
48		2019-10-19	8:10:19	46.9	88.6	61.8	41.5	No	No	
49		2019-10-19	9:10:19	47.5	89.1	64.6	41.2	No	No	
50		2019-10-19	10:10:19	48.4	89.1	67.2	40.8	No	No	
51		2019-10-19	11:10:19	49.0	91.7	72.1	41.1	No	No	
52		2019-10-19	12:10:19	47.4	91.5	66.0	40.9	No	No	
53		2019-10-19	13:10:19	47.9	95.5	71.0	41.8	No	No	
54		2019-10-19	14:10:19	48.1	92.4	63.1	43.4	No	No	
55		2019-10-19	15:10:19	46.4	88.5	59.3	41.9	No	No	
56		2019-10-19	16:10:19	45.1	90.3	56.0	41.7	No	No	
57		2019-10-19	17:10:19	47.1	90.1	65.8	41.2	No	No	
58		2019-10-19	18:10:19	45.1	82.8	52.1	42.5	No	No	
59		2019-10-19	19:10:19	45.2	86.7	51.2	43.0	No	No	
60		2019-10-19	20:10:19	45.6	86.5	54.4	43.4	No	No	
61		2019-10-19	21:10:19	44.3	80.7	50.4	42.3	No	No	
62		2019-10-19	22:10:19	44.9	85.5	52.8	42.6	No	No	
63		2019-10-19	23:10:19	44.4	82.3	54.5	42.5	No	No	
64		2019-10-20	0:10:19	44.6	94.3	63.1	42.2	No	No	
65		2019-10-20	1:10:19	43.1	74.9	49.0	41.5	No	No	
66		2019-10-20	2:10:19	43.0	97.1	58.1	41.3	No	No	
67		2019-10-20	3:10:19	42.8	76.9	50.0	41.4	No	No	
68		2019-10-20	4:10:19	43.2	78.2	51.5	42.0	No	No	
69		2019-10-20	5:10:19	43.6	90.9	54.6	42.0	No	No	
70		2019-10-20	6:10:19	45.4	86.7	59.8	42.8	No	No	
71		2019-10-20	7:10:19	47.0	92.0	61.4	42.9	No	No	
72		2019-10-20	8:10:19	48.7	86.4	65.2	43.2	No	No	
73		2019-10-20	9:10:19	49.0	90.3	72.9	42.9	No	No	

74		2019-10-20	10:10:19	47.8	87.7	65.9	42.0	No	No
75		2019-10-20	11:10:19	46.4	86.4	61.5	41.2	No	No
76		2019-10-20	12:10:19	46.1	95.1	60.2	41.1	No	No
77		2019-10-20	13:10:19	49.3	88.7	65.8	42.3	No	No
78		2019-10-20	14:10:19	47.0	92.9	59.8	42.6	No	No
79		2019-10-20	15:10:19	49.9	89.5	67.5	42.5	No	No
80		2019-10-20	16:10:19	46.2	87.9	58.9	43.6	No	No
81		2019-10-20	17:10:19	49.4	90.4	67.0	43.8	No	No
82		2019-10-20	18:10:19	47.7	90.4	59.1	44.3	No	No
83		2019-10-20	19:10:19	47.9	84.5	61.6	44.1	No	No
84		2019-10-20	20:10:19	47.1	89.2	59.9	43.4	No	No
85		2019-10-20	21:10:19	45.9	87.0	57.2	43.0	No	No
86		2019-10-20	22:10:19	45.2	81.1	52.6	41.5	No	No
87		2019-10-20	23:10:19	44.2	80.5	58.8	41.5	No	No
88		2019-10-21	0:10:19	43.1	81.1	51.8	41.7	No	No
89		2019-10-21	1:10:19	42.3	78.0	48.0	40.9	No	No
90		2019-10-21	2:10:19	41.9	74.0	44.4	40.8	No	No
91		2019-10-21	3:10:19	42.2	75.4	47.4	41.2	No	No
92		2019-10-21	4:10:19	44.0	77.9	51.1	41.9	No	No
93		2019-10-21	5:10:19	46.6	88.6	59.0	43.2	No	No
94		2019-10-21	6:10:19	47.4	84.4	59.5	45.2	No	No
95		2019-10-21	7:10:19	48.9	86.7	57.2	45.2	No	No
96		2019-10-21	8:10:19	50.5	91.9	65.5	46.1	No	No
97		2019-10-21	9:10:19	49.6	88.0	62.5	46.3	No	No
98		2019-10-21	10:10:19	47.8	86.9	56.4	43.7	No	No
99		2019-10-21	11:10:19	47.5	90.7	61.3	43.1	No	No
100		2019-10-21	12:10:19	46.2	90.6	57.2	43.4	No	No
101		2019-10-21	13:10:19	48.1	90.7	65.8	44.2	No	No
102		2019-10-21	14:10:19	46.4	91.3	58.0	43.3	No	No
103		2019-10-21	15:10:19	46.9	90.6	57.5	44.1	No	No
104		2019-10-21	16:10:19	47.2	87.3	67.9	44.3	No	No
105		2019-10-21	17:10:19	47.2	92.6	63.6	44.1	No	No
106		2019-10-21	18:10:19	49.3	93.2	65.3	43.2	No	No
107		2019-10-21	19:10:19	45.6	89.7	58.4	42.7	No	No
108		2019-10-21	20:10:19	45.9	88.1	56.6	43.4	No	No
109		2019-10-21	21:10:19	45.2	90.0	55.1	42.5	No	No
110		2019-10-21	22:10:19	43.9	87.9	51.7	42.5	No	No
111		2019-10-21	23:10:19	44.7	82.0	56.9	42.1	No	No
112		2019-10-22	0:10:19	42.7	76.4	48.7	41.2	No	No
113		2019-10-22	1:10:19	41.7	84.0	45.8	40.7	No	No
114		2019-10-22	2:10:19	42.7	81.2	52.3	40.8	No	No
115		2019-10-22	3:10:19	44.1	87.0	57.5	41.9	No	No
116		2019-10-22	4:10:19	44.0	76.5	51.9	42.4	No	No
117		2019-10-22	5:10:19	46.0	87.2	66.2	42.2	No	No
118		2019-10-22	6:10:19	49.7	93.6	71.9	42.8	No	No
119		2019-10-22	7:10:19	49.3	87.1	60.6	44.3	No	No
120		2019-10-22	8:10:19	50.3	91.6	68.9	46.1	No	No
121		2019-10-22	9:10:19	48.3	88.7	60.4	45.0	No	No
122		2019-10-22	10:10:19	47.0	88.7	58.1	44.1	No	No
123		2019-10-22	11:10:19	46.8	87.9	65.6	42.1	No	No
124		2019-10-22	12:10:19	45.8	88.2	60.6	42.7	No	No
125		2019-10-22	13:10:19	46.4	90.6	60.1	43.0	No	No
126		2019-10-22	14:10:19	48.0	92.5	64.9	43.0	No	No
127		2019-10-22	15:10:19	47.4	90.0	61.4	43.5	No	No
128		2019-10-22	16:10:19	48.6	93.6	69.0	44.0	No	No
129		2019-10-22	17:10:19	46.8	90.0	58.8	43.6	No	No
130		2019-10-22	18:10:19	48.6	93.8	67.0	43.3	No	No
131		2019-10-22	19:10:19	53.8	95.2	75.1	43.4	No	No
132		2019-10-22	20:10:19	45.4	88.6	61.4	41.7	No	No
133		2019-10-22	21:10:19	44.3	86.7	58.3	41.3	No	No
134		2019-10-22	22:10:19	42.6	81.8	48.7	40.9	No	No
135		2019-10-22	23:10:19	43.0	85.8	50.5	41.5	No	No
136		2019-10-23	0:10:19	44.2	85.9	63.6	41.1	No	No
137		2019-10-23	1:10:19	42.4	78.0	49.1	41.2	No	No
138		2019-10-23	2:10:19	43.1	81.0	51.0	41.5	No	No
139		2019-10-23	3:10:19	42.7	78.8	53.8	41.3	No	No
140		2019-10-23	4:10:19	43.0	77.7	51.0	41.2	No	No
141		2019-10-23	5:10:19	45.4	80.2	53.3	43.1	No	No
142		2019-10-23	6:10:19	46.8	87.5	63.5	43.5	No	No
143		2019-10-23	7:10:19	48.7	90.2	68.5	45.1	No	No
144		2019-10-23	8:10:19	48.8	95.1	59.8	45.2	No	No
145		2019-10-23	9:10:19	66.9	105.9	89.5	45.6	No	No
146		2019-10-23	10:10:19	56.1	110.1	81.2	45.0	No	No
147	Stop	2019-10-23	10:28:45						

Summary

File Name on Meter	LxT_Data.036
File Name on PC	SLM_0004435_LxT_Data_036.00.ldbin
Serial Number	0004435
Model	SoundTrack LxT®
Firmware Version	2.302
User	C. Sanchez
Location	ST-1 Judah and 5th
Job Description	UCSF CPHP
Note	

Measurement

Description	
Start	2019-10-17 11:00:32
Stop	2019-10-17 11:16:36
Duration	00:16:04.4
Run Time	00:15:17.5
Pause	00:00:46.9
Pre Calibration	2019-10-17 10:25:17
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT2B
Microphone Correction	Off
Integration Method	Linear
Overload	141.4 dB

	A	C	Z
Under Range Peak	97.7	94.7	**99.7** dB
Under Range Limit	**46.7**	44.7	52.7 dB
Noise Floor	33.6	34.2	41.8 dB

Results

LA_{eq}	63.1 dB	
LAE	92.7 dB	
EA	206.663 µPa²h	
EA8	6.487 mPa²h	
EA40	32.435 mPa²h	
$LZ_{peak\ (max)}$	2019-10-17 11:04:30	101.7 dB
LAS_{max}	2019-10-17 11:10:07	79.6 dB
LAS_{min}	2019-10-17 11:13:51	49.7 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s
LC_{eq}	72.1 dB	
LA_{eq}	63.1 dB	
$LCeq - LA_{eq}$	9.0 dB	
LAI_{eq}	65.1 dB	
LA_{eq}	63.1 dB	
$LAI_{eq} - LA_{eq}$	2.0 dB	

Record #	Record Type	Date	Time	LAeq	LZpeak	LASmax	LASmin	OVLD	OBA OVLD	Marker
1	Run	2019-10-17	11:00:32							
2		2019-10-17	11:00:32	62.2	98.1	69.8	55.6	No	No	
3		2019-10-17	11:01:32	63.1	95.3	70.5	55.8	No	No	
4		2019-10-17	11:02:32	63.6	101.3	71.4	53.3	No	No	
5		2019-10-17	11:03:32	61.6	101.7	67.8	55.3	No	No	
6		2019-10-17	11:04:32	58.3	89.6	64.3	54.5	No	No	
7		2019-10-17	11:05:32	62.1	96.2	69.0	54.4	No	No	
8		2019-10-17	11:06:32	59.2	94.2	65.3	50.1	No	No	
9		2019-10-17	11:07:32	60.3	99.0	64.2	56.3	No	No	
10		2019-10-17	11:08:32	62.8	96.8	72.0	54.7	No	No	
11		2019-10-17	11:09:32	70.7	98.1	79.6	58.7	No	No	
12	Pause	2019-10-17	11:10:11							
13	Resume	2019-10-17	11:10:58							
14		2019-10-17	11:10:58	64.9	93.8	72.4	57.1	No	No	
15		2019-10-17	11:11:58	65.1	93.1	71.7	57.4	No	No	
16		2019-10-17	11:12:58	61.5	100.5	67.1	49.7	No	No	
17		2019-10-17	11:13:58	57.6	94.8	65.7	50.4	No	No	
18		2019-10-17	11:14:58	59.8	89.9	66.3	50.9	No	No	
19		2019-10-17	11:15:58	58.8	92.9	64.6	53.0	No	No	
20	Stop	2019-10-17	11:16:36							

Summary

File Name on Meter	LxT_Data.037
File Name on PC	SLM_0004435_LxT_Data_037.00.ldbin
Serial Number	0004435
Model	SoundTrack LxT®
Firmware Version	2.302
User	C. Sanchez
Location	ST-2 Kirkham and 5th Ave.
Job Description	UCSF CPHP
Note	

Measurement

Description	
Start	2019-10-17 11:33:19
Stop	2019-10-17 11:48:23
Duration	00:15:03.8
Run Time	00:15:03.8
Pause	00:00:00.0
Pre Calibration	2019-10-17 10:25:17
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT2B
Microphone Correction	Off
Integration Method	Linear
Overload	141.4 dB

	A	**C**	**Z**	
Under Range Peak	97.7	94.7	**99.7**	dB
Under Range Limit	**46.7**	44.7	52.7	dB
Noise Floor	33.6	34.2	41.8	dB

Results

LA_{eq}	57.6	dB	
LAE	87.1	dB	
EA	57.269	µPa²h	
EA8	1.825	mPa²h	
EA40	9.125	mPa²h	
$LZ_{peak\ (max)}$	2019-10-17 11:43:58	97.3	dB
LAS_{max}	2019-10-17 11:46:43	72.4	dB
LAS_{min}	2019-10-17 11:46:11	46.4	dB
SEA	-99.9	dB	

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LC_{eq}	68.5	dB
LA_{eq}	57.6	dB
LC_{eq} - LA_{eq}	10.9	dB
LAI_{eq}	61.0	dB
LA_{eq}	57.6	dB
LAI_{eq} - LA_{eq}	3.5	dB

Record #	Record Type	Date	Time	LAeq	LZpeak	LASmax	LASmin	OVLD	OBA OVLD	Marker
1	Run	2019-10-17	11:33:19							
2		2019-10-17	11:33:19	58.8	88.7	67.9	54.5	No	No	
3		2019-10-17	11:34:19	57.9	93.5	67.3	51.5	No	No	
4		2019-10-17	11:35:19	55.6	92.2	58.6	52.3	No	No	
5		2019-10-17	11:36:19	55.8	92.3	60.1	50.5	No	No	
6		2019-10-17	11:37:19	55.8	93.2	58.8	53.8	No	No	
7		2019-10-17	11:38:19	56.9	93.3	60.5	53.9	No	No	
8		2019-10-17	11:39:19	60.8	94.3	67.5	54.8	No	No	
9		2019-10-17	11:40:19	56.9	86.9	62.5	54.1	No	No	
10		2019-10-17	11:41:19	55.6	88.5	59.4	53.6	No	No	
11		2019-10-17	11:42:19	54.9	95.8	58.5	51.3	No	No	
12		2019-10-17	11:43:19	59.2	97.3	68.4	52.7	No	No	
13		2019-10-17	11:44:19	55.6	90.8	68.6	47.9	No	No	
14		2019-10-17	11:45:19	51.4	89.2	56.2	46.4	No	No	
15		2019-10-17	11:46:19	62.1	96.9	72.4	49.2	No	No	
16		2019-10-17	11:47:19	53.8	86.9	60.4	46.5	No	No	
17		2019-10-17	11:48:19	55.8	85.1	56.6	52.0	No	No	
18	Stop	2019-10-17	11:48:23							

Summary

File Name on Meter	LxT_Data.035
File Name on PC	SLM_0004435_LxT_Data_035.00.ldbin
Serial Number	0004435
Model	SoundTrack LxT®
Firmware Version	2.302
User	C. Sanchez
Location	ST-3 Irving and Arguello
Job Description	UCSF CPHP
Note	

Measurement

Description	
Start	2019-10-17 10:34:44
Stop	2019-10-17 10:50:01
Duration	00:15:17.7
Run Time	00:15:17.7
Pause	00:00:00.0
Pre Calibration	2019-10-17 10:25:36
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT2B
Microphone Correction	Off
Integration Method	Linear
Overload	141.4 dB

	A	**C**	**Z**
Under Range Peak	97.7	94.7	**99.7** dB
Under Range Limit	**46.7**	44.7	52.7 dB
Noise Floor	33.6	34.2	41.8 dB

Results

L_{Aeq}	68.9 dB	
LAE	98.5 dB	
EA	788.319 µPa²h	
EA8	24.740 mPa²h	
EA40	123.698 mPa²h	
$LZ_{peak\ (max)}$	2019-10-17 10:48:01	105.4 dB
LAS_{max}	2019-10-17 10:48:01	82.8 dB
LAS_{min}	2019-10-17 10:46:06	52.1 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s
LC_{eq}	75.8 dB	
LA_{eq}	68.9 dB	
LC_{eq} - LA_{eq}	6.9 dB	
LAI_{eq}	71.2 dB	
LA_{eq}	68.9 dB	
LAI_{eq} - LA_{eq}	2.3 dB	

Record #	Record Type	Date	Time	LAeq	LZpeak	LASmax	LASmin	OVLD	OBA OVLD	Marker
1	alibration Chang	2019-10-17	10:25:36							
2	Run	2019-10-17	10:34:44							
3		2019-10-17	10:34:44	66.8	91.9	72.7	57.9	No	No	
4		2019-10-17	10:35:44	71.6	96.3	75.1	63.0	No	No	
5		2019-10-17	10:36:44	60.6	91.0	65.5	54.8	No	No	
6		2019-10-17	10:37:44	66.3	95.2	79.0	56.2	No	No	
7		2019-10-17	10:38:44	70.0	98.1	77.8	55.0	No	No	
8		2019-10-17	10:39:44	68.7	95.7	77.6	59.5	No	No	
9		2019-10-17	10:40:44	69.3	97.0	75.9	63.2	No	No	
10		2019-10-17	10:41:44	70.6	95.3	75.5	62.2	No	No	
11		2019-10-17	10:42:44	73.9	95.9	78.1	62.2	No	No	
12		2019-10-17	10:43:44	68.8	97.2	79.2	57.3	No	No	
13		2019-10-17	10:44:44	57.1	93.0	62.4	53.4	No	No	
14		2019-10-17	10:45:44	56.1	87.7	63.0	52.1	No	No	
15		2019-10-17	10:46:44	60.5	90.2	65.3	54.0	No	No	
16		2019-10-17	10:47:44	73.1	105.4	82.8	62.4	No	No	
17		2019-10-17	10:48:44	61.0	90.3	66.2	56.9	No	No	
18		2019-10-17	10:49:44	61.9	89.3	63.0	60.7	No	No	
19	Stop	2019-10-17	10:50:01							

Appendix SHDW
Shadow Study Appendix

PREVISION DESIGN

FAN 1

UCSF HEIGHTS PLAN PROJECT

Net New Shadow Fan Diagram, factoring in existing shadow



ALL AREAS RECEIVING NET NEW SHADOW CAST BY THE PROPOSED PROJECT

FULL YEAR

Proposed Project

Project Open Space

Refined Shadow Fan of Proposed Project

occasional shadow — frequent shadow

SFUSD Schools

1. Independence High School
2. Grattan Elementary School

Publicly Accessible Open Spaces (Ownership)

1. Golden Gate Park (RPD)
2. Richard Gamble Memorial Park (RPD)
3. Grattan Playground (RPD)
4. Interior Greenbelt (RPD)
5. Mount Sutro Open Space Preserve (UCSF)

PREVISION DESIGN

B1.1

CPHP PROJECT

Shading diagrams on the Summer Solstice

6:46 AM

SUMMER SOLSTICE

JUNE 21



Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Oper Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

B1.2

CPHP PROJECT

Shading diagrams on the Summer Solstice

7:00 AM

SUMMER SOLSTICE
JUNE 21

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Oper Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

B1.3

CPHP PROJECT

Shading diagrams on the Summer Solstice

8:00 AM

SUMMER SOLSTICE

JUNE 21

BASEBALL FIELDS

ROBIN WILLIAMS MEADOW

KORET PLAYGROUND

KEZAR DRIVE

KEZAR STADIUM

LINCOLN WAY

FREDERICK STREET

CARL STREET

PARNASSUS AVENUE

IRVING STREET

JUDAH STREET

KIRKHAM STREET

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Oper Spaces
- Existing (current) Shadows
- New Shading by Project

N

PREVISION DESIGN

B1.4

CPHP PROJECT

Shading diagrams on the Summer Solstice

9:00 AM

SUMMER SOLSTICE

JUNE 21



Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Oper Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

B1.5

CPHP PROJECT

Shading diagrams on the Summer Solstice

10:00 AM

SUMMER SOLSTICE

JUNE 21



Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Oper Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

B1.6

CPHP PROJECT

Shading diagrams on the Summer Solstice

11:00 AM

SUMMER SOLSTICE

JUNE 21

ROBIN WILLIAMS MEADOW

KOret PLAYGROUND

BASEBALL FIELDS

KEZAR DRIVE

KEZAR STADIUM

LINCOLN WAY

FREDERICK STREET

CARL STREET

ARGUELLO BOULEVARD

IRVING STREET

JUDAH STREET

KIRKHAM STREET

N

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Oper Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

B1.7

CPHP PROJECT

Shading diagrams on the Summer Solstice

12:00 PM

SUMMER SOLSTICE
JUNE 21

ROBIN WILLIAMS MEADOW

KORET PLAYGROUND

BASEBALL FIELDS

KEZAR DRIVE

KEZAR STADIUM

LINCOLN WAY

FREDERICK STREET

CARL STREET

IRVING STREET

JUDAH STREET

ARGUELLO BOULEVARD

PARNASSUS AVENUE

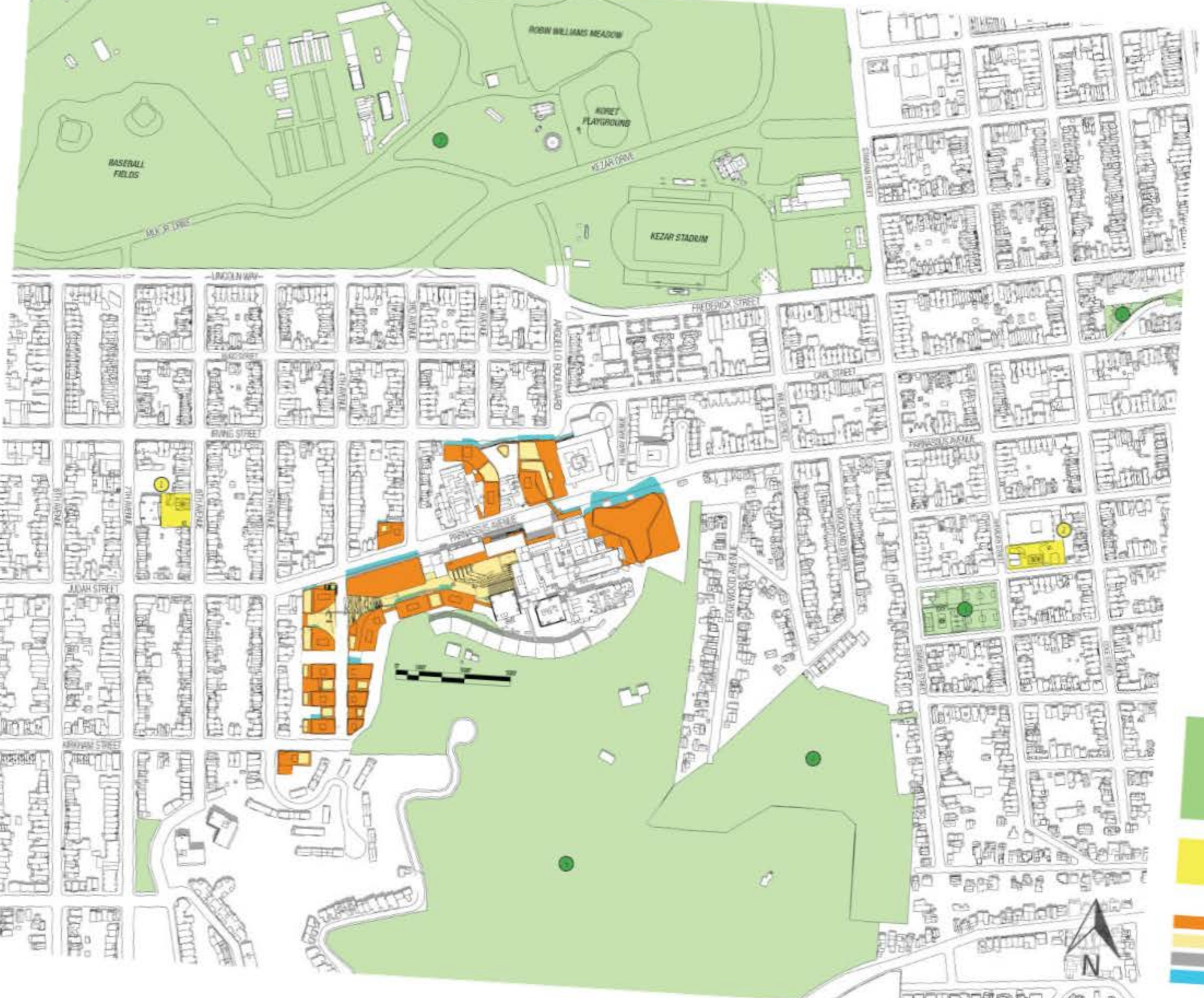
EDGEWOOD AVENUE

N

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project



PREVISION DESIGN

B1.8

CPHP PROJECT

Shading diagrams on the Summer Solstice

1:00 PM

SUMMER SOLSTICE
JUNE 21

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

Proposed Project
Project Open Spaces
Existing (current) Shadows
New Shading by Project



PREVISION DESIGN

B1.9

CPHP PROJECT

Shading diagrams on the Summer Solstice

2:00 PM

SUMMER SOLSTICE

JUNE 21

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (HPU)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

Proposed Project
Project Open Spaces
Existing (current) Shadows
New Shading by Project

PREVISION DESIGN

B1.10

CPHP PROJECT

Shading diagrams on the Summer Solstice

3:00 PM

SUMMER SOLSTICE
JUNE 21



PREVISION DESIGN

B1.11

CPHP PROJECT

Shading diagrams on the Summer Solstice

4:00 PM

SUMMER SOLSTICE
JUNE 21

ROBIN WILLIAMS MEADOW

KORET PLAYGROUND

KEZAR DRIVE

BASEBALL FIELDS

KEZAR STADIUM

LINCOLN WAY

FREDERICK STREET

ARGUELLO BOULEVARD

CARL STREET

PARNASSUS AVENUE

IRVING STREET

JUDAH STREET

KIRKHAM STREET

N

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (HHU)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

B1.12

CPHP PROJECT

Shading diagrams on the Summer Solstice

5:00 PM

SUMMER SOLSTICE
JUNE 21



Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (HHU)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

B1.13

CPHP PROJECT

Shading diagrams on the Summer Solstice

6:00 PM

SUMMER SOLSTICE
JUNE 21





PREVISION DESIGN

B1.14

CPHP PROJECT

Shading diagrams on the Summer Solstice

7:00 PM

SUMMER SOLSTICE

JUNE 21

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- 1 Independence High School
- 2 Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

B1.15

CPHP PROJECT

Shading diagrams on the Summer Solstice

7:36 PM

SUMMER SOLSTICE
JUNE 21

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- 1 Independence High School
- 2 Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

C1.1

CPHP PROJECT

Shading diagrams near the Fall/Spring Equinoxes

7:57 AM

APPROX. FALL EQUINOX (SPRING SIMILAR)
SEPTEMBER 20

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- 1 Independence High School
- 2 Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

C1.2

CPHP PROJECT

Shading diagrams near the Fall/Spring Equinoxes

8:00 AM

APPROX. FALL EQUINOX (SPRING SIMILAR)
SEPTEMBER 20



Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- 1 Independence High School
- 2 Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

C1.3

CPHP PROJECT

Shading diagrams near the Fall/Spring Equinoxes

9:00 AM

APPROX. FALL EQUINOX (SPRING SIMILAR) SEPTEMBER 20

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- 1 Independence High School
- 2 Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

C1.4

CPHP PROJECT

Shading diagrams near the Fall/Spring Equinoxes

10:00 AM

APPROX. FALL EQUINOX (SPRING SIMILAR)
SEPTEMBER 20

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- 1 Independence High School
- 7 Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

C1.5

CPHP PROJECT

Shading diagrams near the Fall/Spring Equinoxes

11:00 AM

APPROX. FALL EQUINOX (SPRING SIMILAR) SEPTEMBER 20

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- 1 Independence High School
- 2 Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

C1.6

CPHP PROJECT

Shading diagrams near the Fall/Spring Equinoxes

12:00 PM

APPROX. FALL EQUINOX (SPRING SIMILAR)
SEPTEMBER 20

- Publicly Accessible Open Spaces (Ownership)
  - Golden Gate Park (RPD)
  - Richard Gamble Memorial Park (RPD)
  - Grattan Playground (RPD)
  - Interior Greenbelt (RPD)
  - Mount Sutro Open Space Preserve (UCSF)
- SFUSD SCHOOLS
  - 1 Independence High School
  - 7 Grattan Elementary School
- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project



PREVISION DESIGN

C1.7

CPHP PROJECT

Shading diagrams near the Fall/Spring Equinoxes

1:00 PM

APPROX. FALL EQUINOX (SPRING SIMILAR)

SEPTEMBER 20

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- 1 Independence High School
- 2 Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

C1.8

CPHP PROJECT

Shading diagrams near the Fall/Spring Equinoxes

2:00 PM

APPROX. FALL EQUINOX (SPRING SIMILAR)
SEPTEMBER 20



Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- 1 Independence High School
- 7 Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

C1.9

CPHP PROJECT

Shading diagrams near the Fall/Spring Equinoxes

3:00 PM

APPROX. FALL EQUINOX (SPRING SIMILAR)
SEPTEMBER 20



Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
1. Independence High School
2. Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

C1.10

CPHP PROJECT

Shading diagrams near the Fall/Spring Equinoxes

4:00 PM

APPROX. FALL EQUINOX (SPRING SIMILAR)
SEPTEMBER 20

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

N



PREVISION DESIGN

C1.11

CPHP PROJECT

Shading diagrams near the Fall/Spring Equinoxes

5:00 PM

APPROX. FALL EQUINOX (SPRING SIMILAR)

SEPTEMBER 20

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- 1 Independence High School
- 2 Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

C1.12

CPHP PROJECT

Shading diagrams near the Fall/Spring Equinoxes

6:00 PM

APPROX. FALL EQUINOX (SPRING SIMILAR)
SEPTEMBER 20



Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project



PREVISION DESIGN

C1.13

CPHP PROJECT

Shading diagrams near the Fall/Spring Equinoxes

6:09 PM

APPROX. FALL EQUINOX (SPRING SIMILAR)

SEPTEMBER 20

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- 1 Independence High School
- 2 Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

D1.1

CPHP PROJECT

Shading diagrams on the Winter Solstice



8:19 AM

WINTER SOLSTICE
DECEMBER 20

- Publicly Accessible Open Spaces (Ownership)
  - Golden Gate Park (RPD)
  - Richard Gamble Memorial Park (RPD)
  - Grattan Playground (RPD)
  - Interior Greenbelt (RPD)
  - Mount Sutro Open Space Preserve (UCSF)
- SFUSD SCHOOLS
  - Independence High School
  - Grattan Elementary School
- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

D1.2

CPHP PROJECT

Shading diagrams on the Winter Solstice

9:00 AM

WINTER SOLSTICE
DECEMBER 20

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

N

PREVISION DESIGN

D1.3

CPHP PROJECT

Shading diagrams on the Winter Solstice

10:00 AM

WINTER SOLSTICE
DECEMBER 20

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- 1 Independence High School
- 7 Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

N

PREVISION DESIGN

D1.4

CPHP PROJECT

Shading diagrams on the Winter Solstice

11:00 AM

WINTER SOLSTICE
DECEMBER 20

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- 1 Independence High School
- 2 Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

N

PREVISION DESIGN

D1.5

CPHP PROJECT

Shading diagrams on the Winter Solstice

12:00 PM

WINTER SOLSTICE
DECEMBER 20



Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

D1.6

CPHP PROJECT

Shading diagrams on the Winter Solstice

1:00 PM

WINTER SOLSTICE
DECEMBER 20

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project

PREVISION DESIGN

D1.7

CPHP PROJECT

Shading diagrams on the Winter Solstice

2:00 PM

WINTER SOLSTICE
DECEMBER 20

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

Proposed Project
Project Open Spaces
Existing (current) Shadows
New Shading by Project

PREVISION DESIGN

D1.8

CPHP PROJECT

Shading diagrams on the Winter Solstice

3:00 PM

WINTER SOLSTICE
DECEMBER 20



Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

- Proposed Project
- Project Open Spaces
- Existing (current) Shadows
- New Shading by Project



PREVISION DESIGN

D1.9

CPHP PROJECT

Shading diagrams on the Winter Solstice

3:54 PM

WINTER SOLSTICE
DECEMBER 20

Publicly Accessible Open Spaces (Ownership)
- Golden Gate Park (RPD)
- Richard Gamble Memorial Park (RPD)
- Grattan Playground (RPD)
- Interior Greenbelt (RPD)
- Mount Sutro Open Space Preserve (UCSF)

SFUSD SCHOOLS
- Independence High School
- Grattan Elementary School

Proposed Project
Project Open Spaces
Existing (current) Shadows
New Shading by Project

GGP1

CPHP PROJECT

Shading diagrams on the date of maximum shading

PREVISION DESIGN

8:19 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion



GGP2

CPHP PROJECT

Shading diagrams on the date of maximum shading

PREVISION DESIGN

8:30 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion



GGP3

CPHP PROJECT

Shading diagrams on the date of maximum shading

PREVISION DESIGN

8:45 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion



GGP4

CPHP PROJECT

Shading diagrams on the date of maximum shading

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

PREVISION DESIGN

9:00 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP5

CPHP PROJECT

Shading diagrams on the date of maximum shading

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

PREVISION DESIGN

9:15 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP6

CPHP PROJECT

Shading diagrams on the date of maximum shading

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

PREVISION DESIGN

9:30 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP7

CPHP PROJECT

Shading diagrams on the date of maximum shading

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

PREVISION DESIGN

9:45 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP8

CPHP PROJECT

Shading diagrams on the date of maximum shading

PREVISION DESIGN

10:00 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion



GGP9

CPHP PROJECT

Shading diagrams on the date of maximum shading

PREVISION DESIGN

10:15 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion



GGP10

CPHP PROJECT

Shading diagrams on the date of maximum shading

PREVISION DESIGN

10:30 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion



GGP11

CPHP PROJECT

Shading diagrams on the date of maximum shading

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

PREVISION DESIGN

10:45 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP12

CPHP PROJECT

Shading diagrams on the date of maximum shading

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

PREVISION DESIGN

11:00 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP13

CPHP PROJECT

Shading diagrams on the date of maximum shading

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

PREVISION DESIGN

11:15 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP14

CPHP PROJECT

Shading diagrams on the date of maximum shading

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

PREVISION DESIGN

11:30 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP15

CPHP PROJECT

Shading diagrams on the date of maximum shading

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

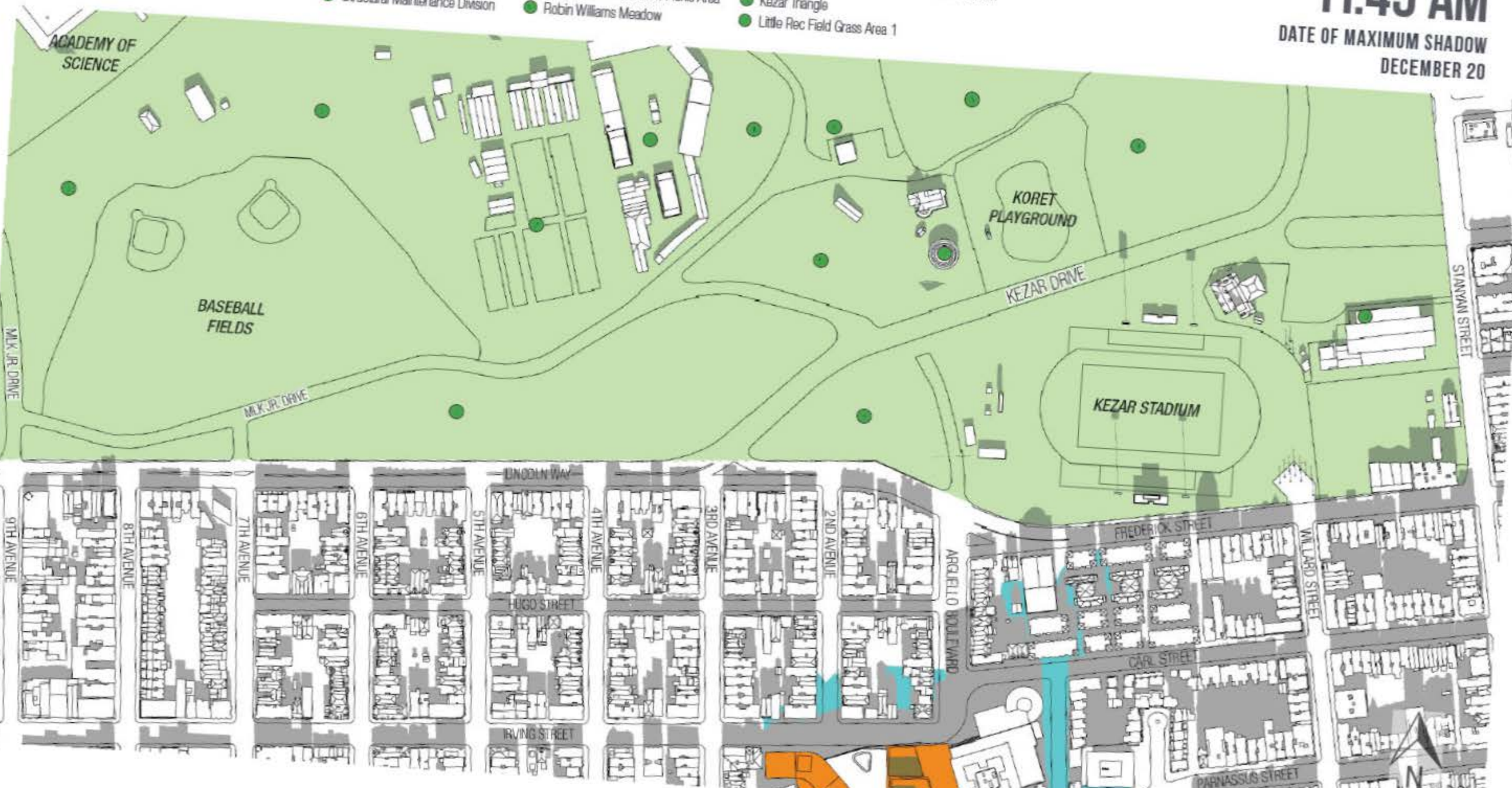
PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

PREVISION DESIGN

11:45 AM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP16

CPHP PROJECT

Shading diagrams on the date of maximum shading

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

PREVISION DESIGN

12:00 PM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP17

CPHP PROJECT

Shading diagrams on the date of maximum shading

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

PREVISION DESIGN

1:00 PM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP18

CPHP PROJECT

Shading diagrams on the date of maximum shading

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

PREVISION DESIGN

1:45 PM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP19

PREVISION DESIGN

CPHP PROJECT

Shading diagrams on the date of maximum shading

Golden Gate Park
Existing (current) Shadows
New Shading by Project
Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

2:00 PM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP20

CPHP PROJECT

Shading diagrams on the date of maximum shading

PREVISION DESIGN

Golden Gate Park
Existing (current) Shadows
New Shading by Project
Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

2:15 PM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP21

CPHP PROJECT

Shading diagrams on the date of maximum shading

PREVISION DESIGN

2:30 PM

DATE OF MAXIMUM SHADOW
DECEMBER 20

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion



GGP22

CPHP PROJECT

Shading diagrams on the date of maximum shading

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion

PREVISION DESIGN

2:45 PM

DATE OF MAXIMUM SHADOW
DECEMBER 20



GGP23

CPHP PROJECT

Shading diagrams on the date of maximum shading

PREVISION DESIGN

3:00 PM

DATE OF MAXIMUM SHADOW
DECEMBER 20

- Golden Gate Park
- Existing (current) Shadows
- New Shading by Project
- Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion



GGP24

CPHP PROJECT

Shading diagrams on the date of maximum shading

PREVISION DESIGN

3:54 PM

DATE OF MAXIMUM SHADOW
DECEMBER 20

Golden Gate Park
Existing (current) Shadows
New Shading by Project
Project

PARK FEATURES

- Wooded areas with walking paths
- Golden Gate Park Nursery
- Structural Maintenance Division
- San Francisco Lawn Bowling Club
- Robin Williams Meadow Picnic Area
- Robin Williams Meadow
- Carousel
- Kezar Triangle
- Little Rec Field Grass Area 1
- Kezar Pavilion



ALMA STREET

SHRADER STREET

RIVOLI STREET

PREVISION DESIGN

GRATTAN PLAYGROUND 1

CPHP PROJECT

Shading diagrams on the date of maximum shading

7:12 AM

DATE OF MAXIMUM SHADOW

AUGUST 2

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)

Existing (current) Shadows

New Shading by Project

N

ALMA STREET

SHRADER STREET

RIVOLI STREET

PREVISION DESIGN

GRATTAN PLAYGROUND 2

CPHP PROJECT

Shading diagrams on the date of maximum shading

8:00 AM

DATE OF MAXIMUM SHADOW

AUGUST 2

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)

Existing (current) Shadows

New Shading by Project

N

ALMA STREET

SHRADER STREET

RIVOLI STREET

PREVISION DESIGN

GRATTAN PLAYGROUND 3

CPHP PROJECT

Shading diagrams on the date of maximum shading

9:00 AM

DATE OF MAXIMUM SHADOW

AUGUST 2

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)

Existing (current) Shadows

New Shading by Project

N

ALMA STREET

SHRADER STREET

RIVOLI STREET

PREVISION DESIGN

GRATTAN PLAYGROUND 4

CPHP PROJECT

Shading diagrams on the date of maximum shading

10:00 AM

DATE OF MAXIMUM SHADOW
AUGUST 2

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)
Existing (current) Shadows
New Shading by Project

N

ALMA STREET

SHRADER STREET

RIVOLI STREET

PREVISION DESIGN

GRATTAN PLAYGROUND 5

CPHP PROJECT

Shading diagrams on the date of maximum shading

11:00 AM

DATE OF MAXIMUM SHADOW

AUGUST 2

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)

Existing (current) Shadows

New Shading by Project

N

ALMA STREET

SHRADER STREET

RIVOLI STREET

PREVISION DESIGN

GRATTAN PLAYGROUND 6

CPHP PROJECT

Shading diagrams on the date of maximum shading

12:00 PM

DATE OF MAXIMUM SHADOW

AUGUST 2

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)

Existing (current) Shadows

New Shading by Project

N

ALMA STREET

SHRADER STREET

RIVOLI STREET

PREVISION DESIGN

GRATTAN PLAYGROUND 7

CPHP PROJECT

Shading diagrams on the date of maximum shading

1:00 PM

DATE OF MAXIMUM SHADOW

AUGUST 2

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)

Existing (current) Shadows

New Shading by Project

N

ALMA STREET

SHRADER STREET

RIVOLI STREET

PREVISION DESIGN

GRATTAN PLAYGROUND 8

CPHP PROJECT

Shading diagrams on the date of maximum shading

2:00 PM

DATE OF MAXIMUM SHADOW

AUGUST 2

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)

Existing (current) Shadows

New Shading by Project

N

ALMA STREET

SHRADER STREET

RIVOLI STREET

PREVISION DESIGN

GRATTAN PLAYGROUND 9

CPHP PROJECT

Shading diagrams on the date of maximum shading

3:00 PM

DATE OF MAXIMUM SHADOW

AUGUST 2

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)

Existing (current) Shadows

New Shading by Project

N

ALMA STREET

SHRADER STREET

RIVOLI STREET

PREVISION DESIGN

GRATTAN PLAYGROUND 10

CPHP PROJECT

Shading diagrams on the date of maximum shading

4:00 PM

DATE OF MAXIMUM SHADOW
AUGUST 2

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)
Existing (current) Shadows
New Shading by Project

N

ALMA STREET

SHRADER STREET

RIVOLI STREET

PREVISION DESIGN

GRATTAN PLAYGROUND 11

CPHP PROJECT

Shading diagrams on the date of maximum shading

5:00 PM

DATE OF MAXIMUM SHADOW
AUGUST 2

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)
Existing (current) Shadows
New Shading by Project

N

ALMA STREET

SHRADER STREET

RIVOLI STREET

PREVISION DESIGN

GRATTAN PLAYGROUND 12

CPHP PROJECT

Shading diagrams on the date of maximum shading

6:00 PM

DATE OF MAXIMUM SHADOW

AUGUST 2

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)

Existing (current) Shadows

New Shading by Project

N

ALMA STREET

SHRADER STREET

RIVOLI STREET

PREVISION DESIGN

GRATTAN PLAYGROUND 13

CPHP PROJECT

Shading diagrams on the date of maximum shading

6:30 PM

DATE OF MAXIMUM SHADOW

AUGUST 2

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)

Existing (current) Shadows

New Shading by Project

N

PREVISION DESIGN

GRATTAN PLAYGROUND 14

CPHP PROJECT

Shading diagrams on the date of maximum shading

6:45 PM

DATE OF MAXIMUM SHADOW
AUGUST 2



PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)
Existing (current) Shadows
New Shading by Project

PREVISION DESIGN

GRATTAN PLAYGROUND 15

CPHP PROJECT

Shading diagrams on the date of maximum shading

7:00 PM

DATE OF MAXIMUM SHADOW
AUGUST 2

ALMA STREET

SHRADER STREET

RIVOLI STREET

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)
Existing (current) Shadows
New Shading by Project

N

PREVISION DESIGN

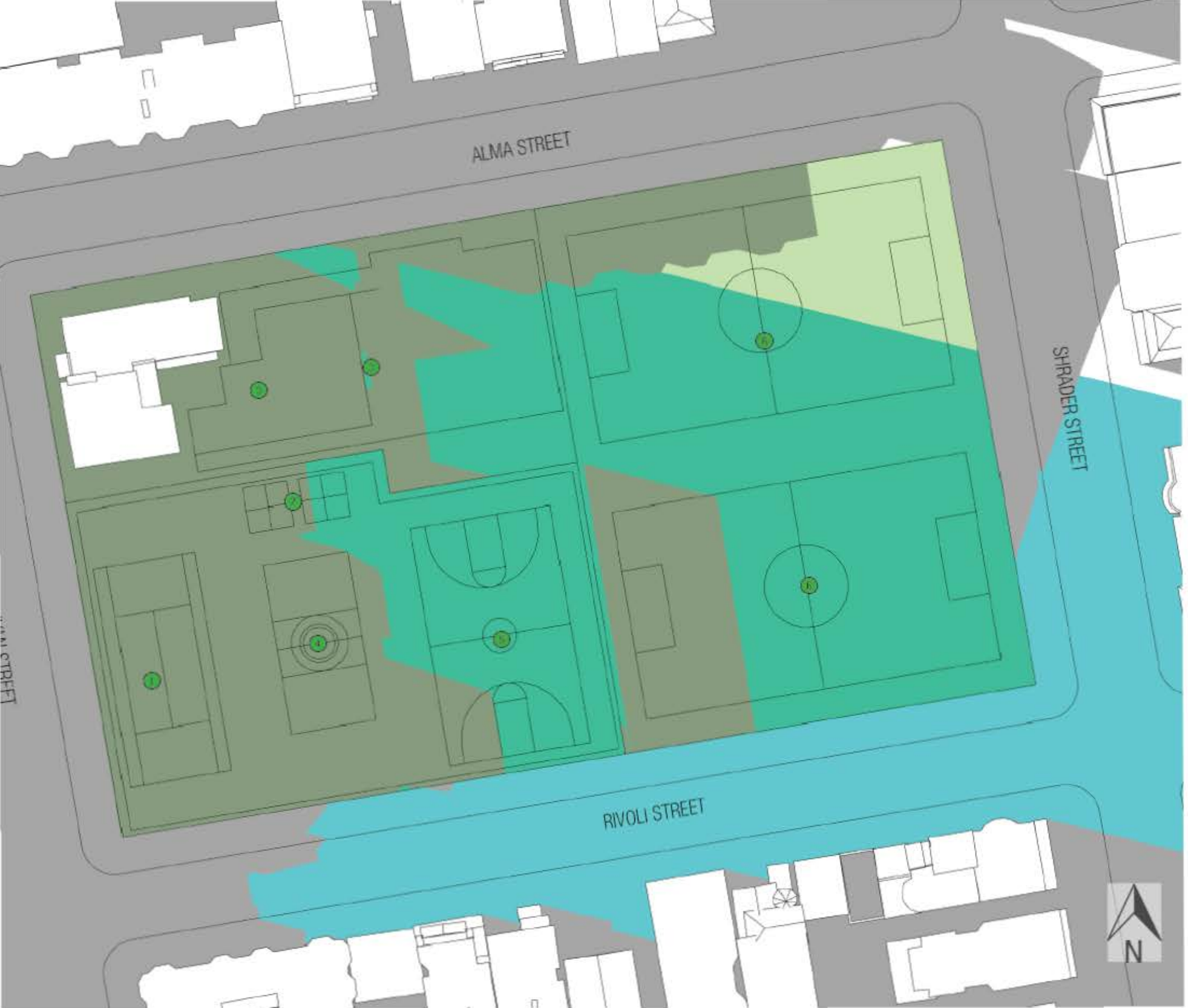
GRATTAN PLAYGROUND 16

CPHP PROJECT

Shading diagrams on the date of maximum shading

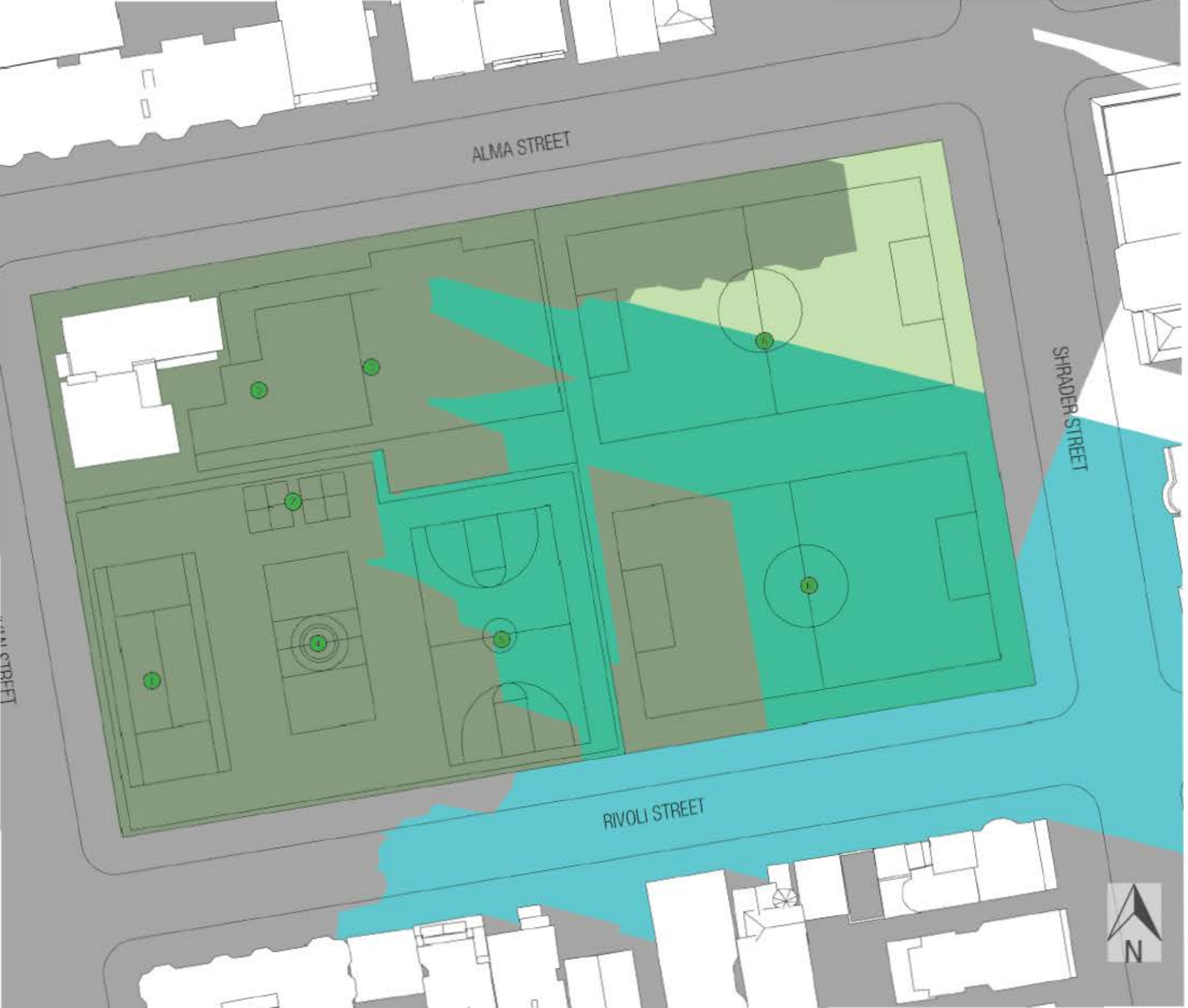
7:15 PM

DATE OF MAXIMUM SHADOW
AUGUST 2



PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)
Existing (current) Shadows
New Shading by Project



PREVISION DESIGN

GRATTAN PLAYGROUND 17

CPHP PROJECT

Shading diagrams on the date of maximum shading

7:18 PM

DATE OF MAXIMUM SHADOW
AUGUST 2

PARK FEATURES
- Tennis court
- Foursquare courts
- Play structure
- Blacktop area
- Basketball court
- Soccer Field

Grattan Playground (RPD)
Existing (current) Shadows
New Shading by Project



PREVISION DESIGN

GAMBLE 1

CPHP PROJECT

Shading diagrams on the date of maximum shading

7:36 AM

DATE OF MAXIMUM SHADOW
NOVEMBER 1

PARK FEATURES
- Walking trail
- Grassy area
- Landscaped area

Richard Gamble Memorial Park
Existing (current) Shadows
New Shading by Project



PREVISION DESIGN

GAMBLE 2

CPHP PROJECT

Shading diagrams on the date of maximum shading

8:00 AM

DATE OF MAXIMUM SHADOW
NOVEMBER 1

PARK FEATURES
- Walking trail
- Grassy area
- Landscaped area

- Richard Gamble Memorial Park
- Existing (current) Shadows
- New Shading by Project



PREVISION DESIGN

GAMBLE 3

CPHP PROJECT

Shading diagrams on the date of maximum shading

9:00 AM

DATE OF MAXIMUM SHADOW
NOVEMBER 1

PARK FEATURES
- Walking trail
- Grassy area
- Landscaped area

Richard Gamble Memorial Park
Existing (current) Shadows
New Shading by Project

FREDERICK STREET

COLE STREET

CLAYTON STREET

CARL STREET

PREVISION DESIGN

GAMBLE 4

CPHP PROJECT

Shading diagrams on the date of maximum shading

10:00 AM

DATE OF MAXIMUM SHADOW
NOVEMBER 1

PARK FEATURES
- Walking trail
- Grassy area
- Landscaped area

Richard Gamble Memorial Park
Existing (current) Shadows
New Shading by Project

N



PREVISION DESIGN

GAMBLE 5

CPHP PROJECT

Shading diagrams on the date of maximum shading

11:00 AM

DATE OF MAXIMUM SHADOW
NOVEMBER 1

PARK FEATURES
- Walking trail
- Grassy area
- Landscaped area

Richard Gamble Memorial Park
Existing (current) Shadows
New Shading by Project



PREVISION DESIGN

GAMBLE 6

CPHP PROJECT

Shading diagrams on the date of maximum shading

12:00 PM

DATE OF MAXIMUM SHADOW
NOVEMBER 1

PARK FEATURES
- Walking trail
- Grassy area
- Landscaped area

Richard Gamble Memorial Park
Existing (current) Shadows
New Shading by Project



PREVISION DESIGN

GAMBLE 7

CPHP PROJECT

Shading diagrams on the date of maximum shading

1:00 PM

DATE OF MAXIMUM SHADOW
NOVEMBER 1

PARK FEATURES
- Walking trail
- Grassy area
- Landscaped area

Richard Gamble Memorial Park
Existing (current) Shadows
New Shading by Project



PREVISION DESIGN

GAMBLE 8

CPHP PROJECT

Shading diagrams on the date of maximum shading

2:00 PM

DATE OF MAXIMUM SHADOW
NOVEMBER 1

PARK FEATURES
- Walking trail
- Grassy area
- Landscaped area

Richard Gamble Memorial Park
Existing (current) Shadows
New Shading by Project

FREDERICK STREET

COLE STREET

CLAYTON STREET

CARL STREET

PREVISION DESIGN

GAMBLE 9

CPHP PROJECT

Shading diagrams on the date of maximum shading

3:00 PM

DATE OF MAXIMUM SHADOW
NOVEMBER 1

PARK FEATURES
- Walking trail
- Grassy area
- Landscaped area

Richard Gamble Memorial Park
Existing (current) Shadows
New Shading by Project

N



PREVISION DESIGN

GAMBLE 10

CPHP PROJECT

Shading diagrams on the date of maximum shading

4:00 PM

DATE OF MAXIMUM SHADOW
NOVEMBER 1

PARK FEATURES
- Walking trail
- Grassy area
- Landscaped area

Richard Gamble Memorial Park
Existing (current) Shadows
New Shading by Project

PREVISION DESIGN

GAMBLE 11

CPHP PROJECT

Shading diagrams on the date of maximum shading

FREDERICK STREET

COLE STREET

CLAYTON STREET

CARL STREET

4:10 PM

DATE OF MAXIMUM SHADOW
NOVEMBER 1

PARK FEATURES
- Walking trail
- Grassy area
- Landscaped area

Richard Gamble Memorial Park
Existing (current) Shadows
New Shading by Project

N

PREVISION DESIGN

GRATTAN 1

CPHP PROJECT

Shading diagrams on the date of maximum shading

7:44 AM

DATE OF MAXIMUM SHADOW
SEPTEMBER 6



PLAYGROUND FEATURES
- Outdoor planter boxes and picnic tables
- Blacktop area
- Basketball court
- Foursquare court
- Play structure

Grattan Elementary Playground
Existing (current) Shadows
New Shading by Project



PREVISION DESIGN

GRATTAN 2

CPHP PROJECT

Shading diagrams on the date of maximum shading

8:00 AM

DATE OF MAXIMUM SHADOW
SEPTEMBER 6

PLAYGROUND FEATURES
- Outdoor planter boxes and picnic tables
- Blacktop area
- Basketball court
- Foursquare court
- Play structure

Grattan Elementary Playground
Existing (current) Shadows
New Shading by Project

GRATTAN STREET

STANYAN STREET

RIVOLI STREET

N

PREVISION DESIGN

GRATTAN 3

CPHP PROJECT

Shading diagrams on the date of maximum shading

9:00 AM

DATE OF MAXIMUM SHADOW
SEPTEMBER 6

PLAYGROUND FEATURES
- Outdoor planter boxes and picnic tables
- Blacktop area
- Basketball court
- Foursquare court
- Play structure

Grattan Elementary Playground
Existing (current) Shadows
New Shading by Project

GRATTAN STREET

STANYAN STREET

RIVOLI STREET

N

PREVISION DESIGN

GRATTAN 4

CPHP PROJECT

Shading diagrams on the date of maximum shading

10:00 AM

DATE OF MAXIMUM SHADOW
SEPTEMBER 6

PLAYGROUND FEATURES
- Outdoor planter boxes and picnic tables
- Blacktop area
- Basketball court
- Foursquare court
- Play structure

Grattan Elementary Playground
Existing (current) Shadows
New Shading by Project

GRATTAN STREET

STANYAN STREET

RIVOLI STREET

N

PREVISION DESIGN

GRATTAN 5

CPHP PROJECT

Shading diagrams on the date of maximum shading

11:00 AM

DATE OF MAXIMUM SHADOW
SEPTEMBER 6

PLAYGROUND FEATURES
- Outdoor planter boxes and picnic tables
- Blacktop area
- Basketball court
- Foursquare court
- Play structure

Grattan Elementary Playground
Existing (current) Shadows
New Shading by Project

GRATTAN STREET

STANYAN STREET

RIVOLI STREET

N

PREVISION DESIGN

GRATTAN 6

CPHP PROJECT

Shading diagrams on the date of maximum shading

12:00 PM

DATE OF MAXIMUM SHADOW
SEPTEMBER 6

PLAYGROUND FEATURES
- Outdoor planter boxes and picnic tables
- Blacktop area
- Basketball court
- Foursquare court
- Play structure

Grattan Elementary Playground
Existing (current) Shadows
New Shading by Project

GRATTAN STREET

STANYAN STREET

RIVOLI STREET

N

PREVISION DESIGN

GRATTAN 7

CPHP PROJECT

Shading diagrams on the date of maximum shading

1:00 PM

DATE OF MAXIMUM SHADOW
SEPTEMBER 6

PLAYGROUND FEATURES
- Outdoor planter boxes and picnic tables
- Blacktop area
- Basketball court
- Foursquare court
- Play structure

Grattan Elementary Playground
Existing (current) Shadows
New Shading by Project

GRATTAN STREET

STANYAN STREET

RIVOLI STREET

PREVISION DESIGN

GRATTAN 8

CPHP PROJECT

Shading diagrams on the date of maximum shading

2:00 PM

DATE OF MAXIMUM SHADOW
SEPTEMBER 6

PLAYGROUND FEATURES
- Outdoor planter boxes and picnic tables
- Blacktop area
- Basketball court
- Foursquare court
- Play structure

Grattan Elementary Playground
Existing (current) Shadows
New Shading by Project

N

GRATTAN STREET

STANYAN STREET

RIVOLI STREET

N

PREVISION DESIGN

GRATTAN 9

CPHP PROJECT

Shading diagrams on the date of maximum shading

3:00 PM

DATE OF MAXIMUM SHADOW
SEPTEMBER 6

PLAYGROUND FEATURES
- Outdoor planter boxes and picnic tables
- Blacktop area
- Basketball court
- Foursquare court
- Play structure

Grattan Elementary Playground
Existing (current) Shadows
New Shading by Project

GRATTAN STREET

STANYAN STREET

RIVOLI STREET

N

PREVISION DESIGN

GRATTAN 10

CPHP PROJECT

Shading diagrams on the date of maximum shading

4:00 PM

DATE OF MAXIMUM SHADOW
SEPTEMBER 6

PLAYGROUND FEATURES
- Outdoor planter boxes and picnic tables
- Blacktop area
- Basketball court
- Foursquare court
- Play structure

Grattan Elementary Playground
Existing (current) Shadows
New Shading by Project

GRATTAN STREET

STANYAN STREET

RIVOLI STREET

N

PREVISION DESIGN

GRATTAN 11

CPHP PROJECT

Shading diagrams on the date of maximum shading

5:00 PM

DATE OF MAXIMUM SHADOW
SEPTEMBER 6

PLAYGROUND FEATURES
- Outdoor planter boxes and picnic tables
- Blacktop area
- Basketball court
- Foursquare court
- Play structure

Grattan Elementary Playground
Existing (current) Shadows
New Shading by Project

GRATTAN STREET

STANYAN STREET

RIVOLI STREET

N

PREVISION DESIGN

GRATTAN 12

CPHP PROJECT

Shading diagrams on the date of maximum shading

6:00 PM

DATE OF MAXIMUM SHADOW
SEPTEMBER 6

PLAYGROUND FEATURES
- Outdoor planter boxes and picnic tables
- Blacktop area
- Basketball court
- Foursquare court
- Play structure

Grattan Elementary Playground
Existing (current) Shadows
New Shading by Project

PREVISION DESIGN

GRATTAN 13

CPHP PROJECT

Shading diagrams on the date of maximum shading

6:31 PM

DATE OF MAXIMUM SHADOW
SEPTEMBER 6

PLAYGROUND FEATURES
- Outdoor planter boxes and picnic tables
- Blacktop area
- Basketball court
- Foursquare court
- Play structure

Grattan Elementary Playground
Existing (current) Shadows
New Shading by Project

GRATTAN STREET

STANYAN STREET

RIVOLI STREET

N

PREVISION DESIGN

IHS 1

CPHP PROJECT

Shading diagrams on the date of maximum shading

7TH STREET

6TH STREET

N

8:16 AM

DATE OF MAXIMUM SHADOW
OCTOBER 11

Independence High School Outdoor Space
Existing (current) Shadows
New Shading by Project

Independence High School Features
- Landscape area with walking path
- Basketball court
- Blacktop area
- Four square court

PREVISION DESIGN

IHS 2

CPHP PROJECT

Shading diagrams on the date of maximum shading

7TH STREET

6TH STREET

N

8:30 AM

DATE OF MAXIMUM SHADOW
OCTOBER 11

Independence High School Outdoor Space
Existing (current) Shadows
New Shading by Project

Independence High School Features
- Landscape area with walking path
- Basketball court
- Blacktop area
- Four square court

PREVISION DESIGN

IHS 3

CPHP PROJECT

Shading diagrams on the date of maximum shading

7TH STREET

6TH STREET

N

8:45 AM

DATE OF MAXIMUM SHADOW
OCTOBER 11

Independence High School Outdoor Space
Existing (current) Shadows
New Shading by Project

Independence High School Features
- Landscape area with walking path
- Basketball court
- Blacktop area
- Four square court

PREVISION DESIGN

IHS 4

CPHP PROJECT

Shading diagrams on the date of maximum shading

9:00 AM

DATE OF MAXIMUM SHADOW
OCTOBER 11

7TH STREET

6TH STREET

N

Independence High School Outdoor Space
Existing (current) Shadows
New Shading by Project

Independence High School Features
- Landscape area with walking path
- Basketball court
- Blacktop area
- Four square court

PREVISION DESIGN

IHS 5

CPHP PROJECT

Shading diagrams on the date of maximum shading

7TH STREET

6TH STREET

N

10:00 AM

DATE OF MAXIMUM SHADOW
OCTOBER 11

Independence High School Outdoor Space
Existing (current) Shadows
New Shading by Project

Independence High School Features
- Landscape area with walking path
- Basketball court
- Blacktop area
- Four square court

PREVISION DESIGN

IHS 6

CPHP PROJECT

Shading diagrams on the date of maximum shading

7TH STREET

6TH STREET

N

11:00 AM

DATE OF MAXIMUM SHADOW
OCTOBER 11

Independence High School Outdoor Space
Existing (current) Shadows
New Shading by Project

Independence High School Features
- Landscape area with walking path
- Basketball court
- Blacktop area
- Four square court

PREVISION DESIGN

IHS 7

CPHP PROJECT

Shading diagrams on the date of maximum shading

12:00 PM

DATE OF MAXIMUM SHADOW
OCTOBER 11

7TH STREET

6TH STREET

N

Independence High School Outdoor Space
Existing (current) Shadows
New Shading by Project

Independence High School Features
- Landscape area with walking path
- Basketball court
- Blacktop area
- Four square court

PREVISION DESIGN

IHS 8

CPHP PROJECT

Shading diagrams on the date of maximum shading

1:00 PM

DATE OF MAXIMUM SHADOW
OCTOBER 11

7TH STREET

6TH STREET

N

Independence High School Outdoor Space
Existing (current) Shadows
New Shading by Project

Independence High School Features
- Landscape area with walking path
- Basketball court
- Blacktop area
- Four square court

PREVISION DESIGN

IHS 9

CPHP PROJECT

Shading diagrams on the date of maximum shading

2:00 PM

DATE OF MAXIMUM SHADOW
OCTOBER 11

7TH STREET

6TH STREET

Independence High School Outdoor Space
Existing (current) Shadows
New Shading by Project

Independence High School Features
- Landscape area with walking path
- Basketball court
- Blacktop area
- Four square court

N

PREVISION DESIGN

IHS 10

CPHP PROJECT

Shading diagrams on the date of maximum shading

7TH STREET

6TH STREET

N

3:00 PM

DATE OF MAXIMUM SHADOW
OCTOBER 11

Independence High School Outdoor Space
Existing (current) Shadows
New Shading by Project

Independence High School Features
- Landscape area with walking path
- Basketball court
- Blacktop area
- Four square court

PREVISION DESIGN

IHS 11

CPHP PROJECT

Shading diagrams on the date of maximum shading

7TH STREET

6TH STREET

N

4:00 PM

DATE OF MAXIMUM SHADOW
OCTOBER 11

Independence High School Outdoor Space
Existing (current) Shadows
New Shading by Project

Independence High School Features
- Landscape area with walking path
- Basketball court
- Blacktop area
- Four square court

PREVISION DESIGN

IHS 12

CPHP PROJECT

Shading diagrams on the date of maximum shading

5:00 PM

DATE OF MAXIMUM SHADOW
OCTOBER 11

7TH STREET

6TH STREET

N

Independence High School Outdoor Space
Existing (current) Shadows
New Shading by Project

Independence High School Features
- Landscape area with walking path
- Basketball court
- Blacktop area
- Four square court

PREVISION DESIGN

IHS 13

CPHP PROJECT

Shading diagrams on the date of maximum shading

7TH STREET

6TH STREET

N

5:37 PM

DATE OF MAXIMUM SHADOW
OCTOBER 11

Independence High School Outdoor Space
Existing (current) Shadows
New Shading by Project

Independence High School Features
- Landscape area with walking path
- Basketball court
- Blacktop area
- Four square court

JUNE 21

Analysis Hours: 6:46 AM-7:36 PM (PDT)

SUMMER SOLSTICE

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:46 AM	636,069.71	69967.67	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	463,186.46	106532.89	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	349,942.75	87485.69	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	273,859.13	68464.78	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	222,423.99	55606.00	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	184,677.55	46169.39	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	156,951.87	39237.97	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	137,210.16	34302.54	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	121,546.40	30386.60	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	109,550.60	27387.65	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	100,336.62	25084.16	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	92,048.46	23012.11	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	85,007.92	21251.98	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	78,139.32	19534.83	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	71,751.26	17937.82	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	65,773.20	16443.30	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	60,319.76	15079.94	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	55,060.30	13765.08	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	50,448.91	12612.23	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	45,806.65	11451.66	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	41,680.20	10420.05	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	37,439.13	9359.78	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	33,290.63	8322.66	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	29,887.20	7471.80	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	27,577.09	6894.27	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	25,932.68	6483.17	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	27,616.77	6904.19	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	28,956.98	7239.25	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	31,677.09	7919.27	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	33,806.44	8451.61	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	36,645.58	9161.39	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	40,181.28	10045.32	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	44,625.15	11156.29	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	48,985.25	12246.31	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	53,645.14	13411.29	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	58,490.19	14622.55	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	64,362.45	16090.61	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	70,781.37	17695.34	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	78,148.14	19537.04	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	85,642.76	21410.69	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	94,023.51	23505.88	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	104,269.10	26067.27	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	115,577.16	28894.29	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	128,234.25	32058.56	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	142,297.68	35574.42	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	158,825.52	39706.38	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	178,571.64	44642.91	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	207,139.37	51784.84	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	244,890.21	61222.55	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	301,434.92	75358.73	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	407,364.76	122209.43	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:36 PM	672,731.63	121091.69	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%

JUNE 28

Analysis Hours: 6:48 AM-7:36 PM (PDT)

JUNE 14 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:48 AM	633,107.13	63310.71	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	485,317.63	106769.88	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	360,973.06	90243.27	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	281,940.09	70485.02	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	228,071.40	57017.85	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	188,473.36	47118.34	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	159,786.60	39946.65	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	139,445.32	34861.33	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	123,239.30	30809.83	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	111,036.30	27759.07	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	101,350.60	25337.65	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	93,018.35	23254.59	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	85,849.96	21462.49	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	79,012.23	19753.06	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	72,566.85	18141.71	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	66,456.53	16614.13	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	61,033.95	15258.49	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	55,677.51	13919.38	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	50,977.94	12744.48	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	46,397.40	11599.35	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	42,231.28	10557.82	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	37,946.12	9486.53	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	33,837.30	8459.33	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	30,363.32	7590.83	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	27,973.86	6993.47	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	26,064.94	6516.23	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	27,616.77	6904.19	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	29,036.34	7259.08	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	31,606.55	7901.64	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	33,810.85	8452.71	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	36,517.73	9129.43	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	40,035.79	10008.95	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	44,268.05	11067.01	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	48,729.55	12182.39	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	53,340.95	13335.24	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	58,168.36	14542.09	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	63,824.60	15956.15	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	70,287.61	17571.90	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	77,438.36	19359.59	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	85,074.05	21268.51	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	93,401.90	23350.47	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	103,418.24	25854.56	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	114,545.54	28636.39	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	127,083.60	31770.90	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	141,107.36	35276.84	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	157,569.07	39392.27	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	176,808.20	44202.05	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	204,926.25	51231.56	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	240,124.52	60031.13	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	295,386.32	73846.58	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	398,300.68	119490.20	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:36 PM	668,331.85	120299.73	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%

JULY 5

Analysis Hours: 6:52 AM-7:36 PM (PDT)

JUNE 7 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:52 AM	625,079.07	37504.74	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	519,563.64	98717.09	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	377,791.87	94447.97	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	293,821.27	73455.32	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	237,585.16	59396.29	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	195,042.17	48760.54	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	163,846.92	40961.73	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	142,742.95	35685.74	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	125,796.29	31449.07	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	113,108.34	28277.08	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	103,224.26	25806.06	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	94,706.84	23676.71	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	87,203.41	21800.85	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	80,330.40	20082.60	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	73,677.82	18419.46	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	67,532.23	16883.06	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	62,122.88	15530.72	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	56,647.40	14161.85	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	51,855.25	12963.81	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	47,332.03	11833.01	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	42,870.52	10717.63	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	38,770.52	9692.63	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	34,503.00	8625.75	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	31,099.56	7774.89	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	28,692.46	7173.12	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	26,607.20	6651.80	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	27,938.59	6984.65	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	29,406.66	7351.66	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	31,928.38	7982.09	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	34,110.63	8527.66	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	36,971.82	9242.95	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	40,194.50	10048.63	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	44,413.53	11103.38	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	48,879.44	12219.86	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	53,490.84	13372.71	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	58,309.44	14577.36	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	63,758.47	15939.62	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	70,062.77	17515.69	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	77,341.37	19335.34	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	84,963.84	21240.96	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	93,278.46	23319.61	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	102,972.97	25743.24	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	114,034.15	28508.54	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	126,894.03	31723.51	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	140,900.15	35225.04	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	157,207.57	39301.89	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	176,697.99	44174.50	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	204,414.86	51103.71	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	240,900.43	60225.11	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	295,783.09	73945.77	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	399,244.12	119773.24	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:36 PM	659,320.67	118677.72	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%

JULY 12

Analysis Hours: 6:56 AM-7:33 PM (PDT)

MAY 31 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:56 AM	614,278.00	18428.34	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	563,561.46	84534.22	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	403,251.54	100812.88	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	311,825.99	77956.50	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	248,324.51	62081.13	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	202,585.29	50646.32	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	169,882.29	42470.57	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	147,054.56	36763.64	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	129,071.88	32267.97	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	115,722.64	28930.66	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	105,190.49	26297.62	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	96,712.76	24178.19	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	89,116.74	22279.18	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	81,807.28	20451.82	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	75,198.79	18799.70	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	68,903.31	17225.83	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	63,313.20	15828.30	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	57,776.00	14444.00	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	53,058.80	13264.70	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	48,478.26	12119.57	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	43,994.72	10998.68	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	39,639.02	9909.75	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	35,486.12	8871.53	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	32,104.72	8026.18	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	29,627.09	7406.77	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	27,607.95	6901.99	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	28,811.50	7202.87	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	30,217.84	7554.46	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	32,726.33	8181.58	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	34,921.82	8730.45	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	37,641.92	9410.48	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	40,785.25	10196.31	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	44,960.20	11240.05	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	49,382.02	12345.51	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	53,966.97	13491.74	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	58,798.79	14699.70	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	64,208.15	16052.04	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	70,265.56	17566.39	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	77,447.17	19361.79	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	85,303.30	21325.82	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	93,578.24	23394.56	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	103,418.24	25854.56	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	114,417.69	28604.42	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	127,264.35	31816.09	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	141,574.67	35393.67	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	158,080.47	39520.12	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	177,972.07	44493.02	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	206,627.97	51656.99	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	244,264.19	61066.05	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	301,681.80	75420.45	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	410,715.30	115000.28	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:33 PM	644,401.96	96660.29	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%

GOLDEN GATE PARK

Quantitative Shading Calculations for CPHP

JULY 19

Analysis Hours: 7:01 AM-7:30 PM (PDT)

MAY 24 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:01 AM	603,490.16	78453.72	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:16 AM	425,038.84	102009.32	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	334,860.92	80366.62	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	262,193.97	65548.49	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	213,289.37	53322.34	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	177,169.71	44292.43	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	152,309.61	38077.40	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	133,431.99	33358.00	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	119,046.72	29761.68	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	108,285.33	27071.33	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	99,371.14	24842.79	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	91,232.87	22808.22	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	83,645.66	20911.42	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	76,918.14	19229.54	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	70,534.49	17633.62	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	64,847.39	16211.85	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	59,305.78	14826.45	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	54,623.85	13655.96	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	49,756.76	12439.19	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	45,224.71	11306.18	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	40,727.94	10181.99	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	36,535.36	9133.84	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	33,330.31	8332.58	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	30,790.96	7697.74	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	28,710.10	7177.52	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	30,006.23	7501.56	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	31,452.25	7863.06	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	33,863.75	8465.94	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	36,160.63	9040.16	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	39,065.90	9766.48	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	41,662.57	10415.64	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	46,000.63	11500.16	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	50,382.78	12595.69	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	55,192.56	13798.14	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	59,918.58	14979.64	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	65,226.53	16306.63	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	71,134.06	17783.51	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	78,258.36	19564.59	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	86,101.26	21525.31	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	94,905.23	23726.31	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	104,286.73	26071.68	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	115,744.68	28936.17	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	128,485.54	32121.38	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	143,333.70	35833.43	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	160,284.77	40071.19	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	181,062.50	45265.63	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	211,358.40	52839.60	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	252,177.63	63044.41	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	314,250.72	78562.68	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	433,327.01	108331.75	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 PM	626,132.73	81397.25	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%

JULY 26

Analysis Hours: 7:07 AM-7:25 PM (PDT)

MAY 17 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:07 AM	590,207.04	35412.42	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	484,211.07	92000.10	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	362,361.77	90590.44	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	281,992.99	70498.25	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	227,004.52	56751.13	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	186,449.81	46612.45	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	159,442.73	39860.68	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	138,400.48	34600.12	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	122,961.56	30740.39	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	111,838.66	27959.67	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	102,333.72	25583.43	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	93,604.69	23401.17	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	86,026.31	21506.58	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	78,818.25	19704.56	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	72,518.36	18129.59	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	66,566.75	16641.69	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	61,100.08	15275.02	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	56,074.28	14018.57	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	51,198.37	12799.59	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	46,556.11	11639.03	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	42,046.11	10511.53	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	38,060.74	9515.18	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	34,767.52	8691.88	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	32,364.83	8091.21	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	30,425.04	7606.26	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	31,721.17	7930.29	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	33,180.42	8295.10	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	35,543.43	8885.86	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	37,902.03	9475.51	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	40,851.38	10212.85	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	43,284.93	10821.23	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	47,503.96	11875.99	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	51,925.79	12981.45	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	56,735.57	14183.89	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	61,633.52	15408.38	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	67,086.96	16771.74	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	72,540.40	18135.10	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	79,677.92	19919.48	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	87,388.57	21847.14	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	96,562.86	24140.72	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	106,372.00	26593.00	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	117,658.01	29414.50	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	130,751.56	32687.89	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	146,128.75	36532.19	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	164,155.52	41038.88	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	185,969.27	46492.32	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	218,756.03	54689.01	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	262,837.62	65709.41	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	335,341.46	83835.37	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	470,672.26	98841.17	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:25 PM	608,269.08	54744.22	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%

AUGUST 2

Analysis Hours: 7:12 AM-7:18 PM (PDT)

MAY 10 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:12 AM	574,380.17	11487.60	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	539,829.97	80974.50	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	394,094.88	98523.72	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	304,331.37	76082.84	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	242,372.90	60593.23	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	196,717.44	49179.36	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	166,483.26	41620.82	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	144,034.67	36008.67	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	128,265.11	32066.28	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	115,700.60	28925.15	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	105,410.92	26352.73	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	96,509.96	24127.49	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	88,477.49	22119.37	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	81,278.25	20319.56	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	74,625.67	18656.42	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	68,638.79	17159.70	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	63,132.45	15783.11	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	57,815.68	14453.92	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	52,750.20	13187.55	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	48,024.18	12006.04	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	43,346.65	10836.66	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	39,727.19	9931.80	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	36,438.37	9109.59	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	34,088.59	8522.15	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	32,430.96	8107.74	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	33,872.57	8468.14	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	35,428.81	8857.20	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	37,637.51	9409.38	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	40,057.84	10014.46	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	43,011.60	10752.90	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	45,581.81	11395.45	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	49,501.06	12375.26	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	53,768.58	13442.15	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	58,763.53	14690.88	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	63,943.63	15985.91	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	69,582.23	17395.56	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	75,137.07	18784.27	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	81,926.31	20481.58	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	89,795.66	22448.92	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	99,027.27	24756.82	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	109,409.52	27352.38	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	121,052.64	30263.16	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	134,251.99	33563.00	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	150,052.41	37513.10	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	169,428.21	42357.05	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	195,778.41	48944.60	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	230,258.07	57564.52	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	282,901.16	70725.29	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	368,877.68	92219.42	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	533,997.39	80099.61	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:18 PM	586,336.29	17590.09	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%

AUGUST 9

Analysis Hours: 7:19 AM-7:10 PM (PDT)

MAY 3 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:19 AM	559,862.65	50387.64	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	435,372.60	91428.25	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	333,256.19	83314.05	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	262,811.17	65702.79	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	209,013.03	52253.26	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	175,485.62	43871.41	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	151,701.22	37925.31	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	133,947.79	33486.95	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	120,021.02	30005.26	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	109,052.43	27263.11	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	99,812.00	24953.00	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	91,431.25	22857.81	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	83,839.64	20959.91	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	76,997.50	19249.37	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	70,821.05	17705.26	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	65,010.51	16252.63	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	59,583.53	14895.88	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	54,337.29	13584.32	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	49,620.09	12405.02	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	44,924.93	11231.23	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	41,477.40	10369.35	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	38,272.35	9568.09	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	35,940.20	8985.05	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	34,745.47	8686.37	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	36,381.06	9095.27	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	37,919.66	9479.92	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	40,278.27	10069.57	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	42,729.45	10682.36	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	45,775.79	11443.95	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	48,469.44	12117.36	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	51,983.10	12995.77	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	56,268.26	14067.06	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	61,540.94	15385.24	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	66,870.94	16717.74	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	72,553.63	18138.41	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	78,685.99	19671.50	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	85,484.05	21371.01	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	93,031.57	23257.89	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	102,377.81	25594.45	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	113,359.63	28339.91	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	125,716.94	31429.23	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	139,273.38	34818.35	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	155,959.93	38989.98	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	177,416.59	44354.15	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	207,875.61	51968.90	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	246,314.19	61578.55	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	310,252.12	105485.72	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:10 PM	562,432.86	118110.90	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%

AUGUST 16

Analysis Hours: 7:25 AM-7:02 PM (PDT)

APRIL 26 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:25 AM	551,384.91	22055.40	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	491,621.93	83575.73	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	367,965.10	91991.28	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	286,454.50	71613.62	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	229,667.32	57416.83	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	187,961.96	46990.49	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	160,474.34	40118.58	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	140,432.84	35108.21	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	125,192.31	31298.08	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	113,381.67	28345.42	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	103,391.78	25847.95	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	94,574.58	23643.65	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	86,718.46	21679.61	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	79,576.53	19894.13	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	73,091.48	18272.87	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	67,029.65	16757.41	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	61,620.30	15405.07	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	56,250.62	14062.66	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	51,290.95	12822.74	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	47,076.33	11769.08	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	43,686.11	10921.53	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	40,648.59	10162.15	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	38,232.68	9558.17	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	37,633.11	9408.28	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	39,396.55	9849.14	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	41,063.00	10265.75	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	43,271.71	10817.93	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	45,727.30	11431.82	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	48,892.67	12223.17	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	51,916.97	12979.24	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	55,232.24	13808.06	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	59,371.91	14842.98	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	64,807.72	16201.93	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	70,186.21	17546.55	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	76,327.39	19081.85	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	82,702.22	20675.56	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	90,038.14	22509.53	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	97,757.59	24439.40	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	107,020.06	26755.02	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	118,050.38	29512.60	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	130,936.72	32734.18	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	146,080.26	36520.06	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	164,023.26	41005.82	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	188,142.71	47035.68	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	222,745.82	55686.45	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	272,285.26	68071.31	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	350,335.11	94590.48	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:02 PM	539,578.68	75541.02	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%

AUGUST 23

Analysis Hours: 7:31 AM-6:52 PM (PDT)

APRIL 19 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:31 AM	548,179.86	60299.78	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	410,270.03	94362.11	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	313,730.50	78432.63	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	249,206.23	62301.56	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	200,098.84	50024.71	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	169,741.22	42435.30	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	147,473.38	36868.34	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	130,544.35	32636.09	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	118,054.79	29513.70	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	107,288.99	26822.25	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	97,881.03	24470.26	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	89,786.84	22446.71	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	82,411.26	20602.81	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	75,851.26	18962.81	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	69,529.33	17382.33	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	63,709.98	15927.49	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	58,256.54	14564.13	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	53,261.59	13315.40	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	49,434.93	12358.73	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	46,097.62	11524.40	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	42,971.92	10742.98	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	40,913.10	10228.28	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	40,952.78	10238.20	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	42,905.79	10726.45	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	44,479.66	11119.92	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	47,063.10	11765.78	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	49,421.70	12355.43	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	52,829.55	13207.39	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	55,708.37	13927.09	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	59,512.99	14878.25	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	63,445.46	15861.36	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	68,854.81	17213.70	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	74,290.62	18572.65	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	80,559.64	20139.91	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	87,494.37	21873.59	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	95,438.67	23859.67	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	103,546.09	25886.52	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	113,302.32	28325.58	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	124,619.19	31154.80	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	137,964.03	34491.01	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	154,751.98	38687.99	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	175,829.49	43957.37	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	203,956.36	50989.09	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	244,934.30	61233.57	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	309,052.98	77263.24	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	419,832.28	79768.13	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:52 PM	520,052.99	31203.18	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%

AUGUST 30

Analysis Hours: 7:37 AM-6:42 PM (PDT)

APRIL 12 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:37 AM	550,375.34	33022.52	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	464,019.68	88163.74	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	347,363.71	86840.93	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	273,277.19	68319.30	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	219,959.58	54989.90	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	180,449.71	45112.43	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	155,444.13	38861.03	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	136,958.87	34239.72	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	122,767.58	30691.90	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	111,675.54	27918.89	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	101,923.72	25480.93	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	93,560.61	23390.15	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	85,572.22	21393.06	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	78,641.90	19660.48	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	72,156.85	18039.21	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	66,174.38	16543.60	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	60,385.89	15096.47	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	55,928.80	13982.20	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	51,987.51	12996.88	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	48,826.54	12206.64	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	45,612.67	11403.17	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	44,241.60	11060.40	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	44,598.69	11149.67	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	46,719.23	11679.81	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	48,266.65	12066.66	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	50,938.26	12734.57	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	53,746.54	13436.63	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	57,070.62	14267.66	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	60,306.54	15076.63	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	64,203.74	16050.93	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	67,801.16	16950.29	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	73,532.34	18383.08	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	79,206.20	19801.55	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	86,105.66	21526.42	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	93,507.70	23376.93	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	101,751.79	25437.95	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	110,546.94	27636.74	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	120,686.72	30171.68	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	132,523.81	33130.95	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	147,671.76	36917.94	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	166,161.43	41540.36	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	191,841.53	47960.38	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	228,340.33	57085.08	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	276,759.98	69190.00	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	363,693.17	83649.43	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:42 PM	498,203.97	54802.44	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%

SEPTEMBER 6

Analysis Hours: 7:44 AM-6:31 PM (PDT)

APRIL 5 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:44 AM	558,645.88	72623.96	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	395,950.90	98987.72	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	304,384.27	76096.07	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	239,926.13	59981.53	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	195,377.23	48844.31	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	164,719.82	41179.96	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	144,211.01	36052.75	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	128,344.46	32086.12	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	116,383.93	29095.98	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	106,213.29	26553.32	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	97,061.03	24265.26	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	88,742.01	22185.50	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	81,578.03	20394.51	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	74,757.93	18689.48	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	68,449.22	17112.31	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	63,000.19	15750.05	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	58,834.06	14708.52	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	54,870.73	13717.68	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	51,670.09	12917.52	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	48,619.34	12154.83	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	48,019.77	12004.94	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	48,835.36	12208.84	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	50,867.72	12716.93	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	52,657.61	13164.40	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	55,408.58	13852.15	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	58,172.77	14543.19	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	61,942.13	15485.53	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	65,332.34	16333.08	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	69,233.95	17308.49	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	73,135.56	18283.89	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	78,549.32	19637.33	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	84,765.45	21191.36	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	92,074.91	23018.73	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	99,944.26	24986.06	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	109,242.00	27310.50	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	118,852.75	29713.19	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	129,918.33	32479.58	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	142,522.52	35630.63	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	159,191.44	39797.86	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	181,847.23	45461.81	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	212,438.51	53109.63	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	256,339.35	64084.84	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	325,034.16	87759.22	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:31 PM	483,139.78	67639.57	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%

SEPTEMBER 13

Analysis Hours: 7:50 AM-6:21 PM (PDT)

MARCH 29 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:50 AM	581,768.98	46541.52	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	464,138.71	97469.13	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	344,215.97	86053.99	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	264,477.62	66119.41	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	214,069.69	53517.42	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	176,230.68	44057.67	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	152,181.76	38045.44	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	134,829.51	33707.38	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	122,101.88	30525.47	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	110,965.76	27741.44	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	101,341.79	25335.45	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	92,462.87	23115.72	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	84,902.12	21225.53	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	77,676.42	19419.11	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	71,358.90	17839.72	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	66,209.65	16552.41	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	61,924.49	15481.12	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	58,093.42	14523.35	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	54,800.19	13700.05	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	51,934.60	12983.65	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	52,190.30	13047.58	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	53,279.23	13319.81	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	55,532.02	13883.01	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	57,432.13	14358.03	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	60,346.21	15086.55	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	63,132.45	15783.11	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	67,175.13	16793.78	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	70,807.82	17701.96	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	75,092.98	18773.25	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	79,281.15	19820.29	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	84,377.49	21094.37	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	91,356.31	22839.08	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	99,252.11	24813.03	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	107,844.47	26961.12	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	117,759.41	29439.85	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	128,282.74	32070.69	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	140,710.58	35177.65	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	155,179.61	38794.90	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	174,864.01	43716.00	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	201,364.11	50341.03	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	242,033.44	60508.36	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	300,495.89	75123.97	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	406,875.41	73237.57	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:21 PM	470,398.93	23519.95	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%

SEPTEMBER 20

Analysis Hours: 7:57 AM-6:09 PM (PDT)

APPROXIMATE EQUINOXES
MARCH 22 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:57 AM	610,402.84	12208.06	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	560,188.89	84028.33	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	400,491.75	100122.94	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	300,178.47	75044.62	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	234,931.19	58732.80	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	193,759.27	48439.82	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	163,009.28	40752.32	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	142,526.93	35631.73	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	128,326.83	32081.71	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	116,388.34	29097.08	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	106,050.17	26512.54	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	96,712.76	24178.19	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	88,724.37	22181.09	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	81,123.95	20280.99	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	75,278.14	18819.54	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	70,075.99	17519.00	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	65,764.38	16441.10	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	61,906.86	15476.71	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	58,591.59	14647.90	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	56,277.08	14069.27	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	57,163.20	14290.80	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	58,322.67	14580.67	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	60,769.44	15192.36	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	62,898.79	15724.70	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	65,923.09	16480.77	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	68,973.84	17243.46	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	73,267.82	18316.96	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	77,023.95	19255.99	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	81,758.78	20439.70	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	86,189.43	21547.36	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	91,448.89	22862.22	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	98,670.17	24667.54	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	107,174.36	26793.59	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	116,445.65	29111.41	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	127,361.34	31840.34	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	139,414.46	34853.61	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	154,059.83	38514.96	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	171,482.61	42870.65	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	195,690.24	48922.56	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	229,975.92	57493.98	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	282,676.33	70669.08	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	373,409.72	78416.04	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:09 PM	466,440.00	37315.20	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

SEPTEMBER 27

Analysis Hours: 8:03 AM-5:58 PM (PDT)

MARCH 15 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:03 AM	661,807.12	66180.71	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	481,438.06	105916.37	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	351,172.75	87793.19	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	268,255.79	67063.95	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	213,465.71	53366.43	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	177,297.56	44324.39	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	151,374.99	37843.75	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	135,385.00	33846.25	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	122,132.74	30533.19	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	111,040.71	27760.18	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	100,989.10	25247.27	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	92,409.96	23102.49	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	84,822.76	21205.69	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	79,272.33	19818.08	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	73,876.21	18469.05	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	69,648.36	17412.09	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	65,618.90	16404.72	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	62,479.98	15619.99	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	60,959.01	15239.75	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	62,237.50	15559.38	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	63,895.14	15973.78	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	66,081.80	16520.45	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	68,585.89	17146.47	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	71,808.57	17952.14	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	75,185.56	18796.39	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	79,704.38	19926.09	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	83,874.91	20968.73	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	88,693.51	22173.38	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	93,745.77	23436.44	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	99,737.06	24934.26	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	106,931.89	26732.97	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	116,441.24	29110.31	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	126,492.85	31623.21	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	138,471.02	34617.75	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	152,688.75	38172.19	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	170,067.45	42516.86	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	192,846.69	48211.67	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	224,888.40	56222.10	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	270,517.41	67629.35	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	347,443.07	79911.91	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:58 PM	470,037.42	51704.12	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%

OCTOBER 4

Analysis Hours: 8:09 AM-5:47 PM (PDT)

MARCH 8 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:09 AM	733,341.06	29333.64	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	626,652.94	106531.00	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	429,905.93	107476.48	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	317,270.61	79317.65	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	243,642.58	60910.65	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	197,555.07	49388.77	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	165,350.25	41337.56	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	143,946.50	35986.62	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	129,270.27	32317.57	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	117,402.32	29350.58	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	106,508.67	26627.17	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	97,545.98	24386.50	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	90,060.18	22515.04	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	84,183.51	21045.88	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	78,536.10	19634.02	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	74,308.25	18577.06	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	70,146.53	17536.63	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	66,976.75	16744.19	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	66,306.64	16576.66	0.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	67,695.35	16923.84	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	69,375.03	17343.76	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	71,909.97	17977.49	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	74,612.44	18653.11	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	78,148.14	19537.04	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	81,683.84	20420.96	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	86,502.44	21625.61	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	91,052.11	22763.03	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	96,532.00	24133.00	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	102,011.89	25502.97	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	108,840.81	27210.20	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	116,000.38	29000.10	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	126,528.12	31632.03	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	137,858.22	34464.56	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	151,621.87	37905.47	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	168,286.38	42071.59	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	190,752.60	47688.15	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	221,013.24	55253.31	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	265,478.38	66369.59	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	330,024.69	89106.67	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:47 PM	477,117.63	66796.47	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%

OCTOBER 11

Analysis Hours: 8:16 AM-5:37 PM (PDT)

MARCH 1 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:16 AM	817,316.08	98077.93	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	553,170.39	132760.89	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	390,329.93	97582.48	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	292,146.00	73036.50	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	227,392.48	56848.12	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	183,341.75	45835.44	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	156,396.38	39099.10	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	137,946.39	34486.60	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	124,764.68	31191.17	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	112,909.95	28227.49	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	103,700.39	25925.10	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	96,029.42	24007.36	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	89,879.43	22469.86	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	84,187.92	21046.98	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	79,563.30	19890.83	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	75,150.29	18787.57	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	72,509.54	18127.39	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	72,222.98	18055.75	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	73,849.76	18462.44	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	75,943.84	18985.96	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	78,456.74	19614.19	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	81,335.56	20333.89	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	85,038.78	21259.70	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	88,830.18	22207.54	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	93,926.52	23481.63	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	98,917.06	24729.26	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	104,952.43	26238.11	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	111,208.23	27802.06	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	118,799.84	29699.96	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	126,682.42	31670.60	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	137,831.77	34457.94	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	150,528.54	37632.13	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	167,056.38	41764.09	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	188,517.44	47129.36	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	217,261.52	54315.38	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	257,944.08	64486.02	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	318,209.64	79552.41	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	420,114.43	79821.74	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:37 PM	495,188.49	29711.31	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%

OCTOBER 18

Analysis Hours: 8:22 AM-5:27 PM (PDT)

FEBRUARY 22 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:22 AM	902,454.96	54147.30	2.0%	4,192.58	251.55	0.0%	0.00	0.00	0.0%
8:30 AM	738,344.82	132902.07	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	508,863.96	127215.99	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	358,129.52	89532.38	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	277,381.60	69345.40	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	214,748.61	53687.15	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	174,996.27	43749.07	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	149,801.12	37450.28	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	133,850.80	33462.70	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	120,695.54	30173.89	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	111,371.35	27842.84	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	103,127.27	25781.82	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	96,435.01	24108.75	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	90,514.26	22628.57	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	85,559.00	21389.75	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	80,687.49	20171.87	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	78,760.94	19690.23	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	78,805.02	19701.26	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	80,471.47	20117.87	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	82,711.04	20677.76	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	85,259.21	21314.80	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	88,358.46	22089.61	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	92,343.83	23085.96	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	96,435.01	24108.75	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	102,166.19	25541.55	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	107,421.25	26855.31	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	113,884.25	28471.06	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	120,832.21	30208.05	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	129,495.11	32373.78	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	138,422.52	34605.63	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	150,634.34	37658.59	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	166,240.79	41560.20	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	187,141.96	46785.49	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	213,523.02	53380.76	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	256,048.38	64012.10	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	306,491.58	76622.90	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	389,531.97	85697.03	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:27 PM	519,550.41	51955.04	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%

OCTOBER 25

Analysis Hours: 7:30 AM-4:18 PM (PST)

FEBRUARY 15 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:30 AM	997,760.08	129708.81	2.2%	77,322.44	10051.92	0.2%	0.00	0.00	0.0%
7:45 AM	666,211.31	166552.83	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	463,530.33	115882.58	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	345,106.51	86276.63	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	266,875.90	66718.98	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	210,613.35	52653.34	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	170,331.97	42582.99	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	147,627.68	36906.92	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	130,866.18	32716.55	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	120,598.55	30149.64	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	111,071.57	27767.89	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	104,132.43	26033.11	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	97,444.58	24361.15	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	92,414.37	23103.59	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	87,415.02	21853.75	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	85,951.36	21487.84	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	86,180.61	21545.15	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	87,992.54	21998.14	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	90,073.40	22518.35	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	93,000.71	23250.18	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	96,254.26	24063.57	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	100,720.17	25180.04	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	104,996.52	26249.13	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	111,102.43	27775.61	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	116,767.48	29191.87	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	124,195.97	31048.99	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	131,897.79	32974.45	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	142,275.64	35568.91	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	152,494.77	38123.69	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	166,421.54	41605.39	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	185,510.78	46377.69	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	212,667.76	53166.94	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	250,286.34	62571.59	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	302,078.57	75519.64	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	379,718.43	94929.61	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	519,995.68	77999.35	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:18 PM	557,252.76	16717.58	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%

NOVEMBER 1

Analysis Hours: 7:36 AM-4:10 PM (PST)

FEBRUARY 8 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:36 AM	1,103,619.39	77253.36	2.5%	147,070.90	10294.96	0.3%	0.00	0.00	0.0%
7:45 AM	872,961.43	165862.67	2.0%	67,279.65	12783.13	0.2%	0.00	0.00	0.0%
8:00 AM	605,985.42	151496.36	1.4%	454.09	113.52	0.0%	0.00	0.00	0.0%
8:15 AM	443,440.34	110860.08	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	331,351.68	82837.92	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	263,754.61	65938.65	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	209,021.84	52255.46	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	168,855.09	42213.77	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	146,640.15	36660.04	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	131,968.33	32992.08	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	120,647.05	30161.76	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	112,442.64	28110.66	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	105,318.34	26329.59	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	99,856.09	24964.02	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	94,764.15	23691.04	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	93,736.95	23434.24	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	93,833.94	23458.48	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	95,720.82	23930.21	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	98,039.74	24509.94	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	101,205.12	25301.28	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	104,683.50	26170.88	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	109,510.92	27377.73	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	114,073.82	28518.46	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	120,448.66	30112.16	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	126,660.38	31665.09	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	135,142.52	33785.63	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	143,774.56	35943.64	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	155,726.28	38931.57	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	169,057.88	42264.47	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	186,440.99	46610.25	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	209,784.53	52446.13	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	247,473.65	61868.41	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	294,328.26	73582.06	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	363,503.60	90875.90	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	481,464.51	101107.55	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:10 PM	614,410.26	55296.92	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%

NOVEMBER 8

Analysis Hours: 7:43 AM-4:03 PM (PST)

FEBRUARY 1 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:43 AM	1,198,637.94	11986.38	2.7%	208,046.25	2080.46	0.5%	0.00	0.00	0.0%
7:45 AM	1,160,018.61	150802.42	2.6%	199,048.30	25876.28	0.4%	0.00	0.00	0.0%
8:00 AM	784,176.63	196044.16	1.8%	53,048.69	13262.17	0.1%	0.00	0.00	0.0%
8:15 AM	569,292.64	142323.16	1.3%	1,719.35	429.84	0.0%	0.00	0.00	0.0%
8:30 AM	426,696.47	106674.12	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	328,948.99	82237.25	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	262,599.56	65649.89	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	211,887.43	52971.86	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	173,567.88	43391.97	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	150,140.58	37535.15	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	132,678.12	33169.53	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	123,627.26	30906.81	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	114,594.04	28648.51	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	108,280.92	27070.23	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	102,677.59	25669.40	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	101,531.36	25382.84	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	101,725.33	25431.33	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	103,709.20	25927.30	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	105,781.25	26445.31	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	109,277.27	27319.32	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	112,927.59	28231.90	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	118,306.08	29576.52	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	123,076.18	30769.05	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	129,918.33	32479.58	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	137,148.44	34287.11	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	146,353.59	36588.40	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	156,951.87	39237.97	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	172,699.39	43174.85	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	187,635.72	46908.93	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	210,661.84	52665.46	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	241,623.44	60405.86	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	288,433.96	72108.49	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	348,686.29	87171.57	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	448,832.06	112208.01	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	627,684.55	94152.68	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:03 PM	676,703.78	20301.11	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%

NOVEMBER 15

Analysis Hours: 7:51 AM-3:57 PM (PST)

JANUARY 25 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:51 AM	1,322,740.04	105819.20	3.0%	241,732.36	19338.59	0.5%	0.00	0.00	0.0%
8:00 AM	1,019,547.38	203909.48	2.3%	168,346.80	33669.36	0.4%	0.00	0.00	0.0%
8:15 AM	719,775.80	179943.95	1.6%	26,425.15	6606.29	0.1%	0.00	0.00	0.0%
8:30 AM	532,930.51	133232.63	1.2%	3,566.56	891.64	0.0%	0.00	0.00	0.0%
8:45 AM	414,286.26	103571.57	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	319,814.37	79953.59	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	267,426.98	66856.74	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	215,489.26	53872.31	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	179,281.43	44820.36	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	153,178.11	38294.53	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	137,531.98	34383.00	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	125,809.52	31452.38	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	118,632.32	29658.08	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	111,909.20	27977.30	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	109,947.37	27486.84	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	109,471.24	27367.81	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	111,358.13	27839.53	0.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	113,747.59	28436.90	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	117,195.11	29298.78	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	120,933.60	30233.40	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	126,585.43	31646.36	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	131,796.40	32949.10	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	139,291.02	34822.75	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	147,905.42	36976.36	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	159,667.57	39916.89	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	172,602.40	43150.60	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	189,218.41	47304.60	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	209,136.47	52284.12	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	239,463.23	59865.81	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	278,757.08	69689.27	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	333,168.02	83292.01	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	417,059.27	104264.82	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	561,683.40	129187.18	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:57 PM	746,249.44	82087.44	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%

GOLDEN GATE PARK

Quantitative Shading Calculations for CPHP

NOVEMBER 22

Analysis Hours: 7:57 AM-3:54 PM (PST)

JANUARY 18 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:57 AM	1,453,688.69	29073.77	3.2%	249,279.88	4985.60	0.6%	0.00	0.00	0.0%
8:00 AM	1,355,989.70	203398.45	3.0%	238,760.96	35814.14	0.5%	0.00	0.00	0.0%
8:15 AM	909,235.39	227308.85	2.0%	107,353.82	26838.46	0.2%	0.00	0.00	0.0%
8:30 AM	660,017.23	165004.31	1.5%	24,370.74	6092.69	0.1%	0.00	0.00	0.0%
8:45 AM	507,999.88	126999.97	1.1%	7,080.21	1770.05	0.0%	0.00	0.00	0.0%
9:00 AM	392,243.26	98060.82	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	317,909.86	79477.46	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	266,703.97	66675.99	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	219,598.08	54899.52	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	182,133.79	45533.45	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	159,835.09	39958.77	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	141,107.36	35276.84	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	129,733.17	32433.29	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	121,343.60	30335.90	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	119,227.48	29806.87	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	118,213.50	29553.37	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	119,910.81	29977.70	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	122,040.16	30510.04	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	125,716.94	31429.23	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	129,693.49	32423.37	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	135,684.78	33921.20	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	141,080.91	35270.23	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	150,409.50	37602.38	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	159,583.80	39895.95	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	174,621.54	43655.38	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	187,543.14	46885.79	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	208,038.73	52009.68	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	232,369.79	58092.45	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	268,030.96	67007.74	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	312,169.86	78042.47	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	384,365.10	96091.27	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	491,626.34	122906.58	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	666,268.62	133253.72	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:54 PM	818,850.27	65508.02	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%

GOLDEN GATE PARK

Quantitative Shading Calculations for CPHP

NOVEMBER 29

Analysis Hours: 8:04 AM-3:51 PM (PST)

JANUARY 11 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:04 AM	1,574,801.75	141732.16	3.5%	244,778.70	22030.08	0.5%	0.00	0.00	0.0%
8:15 AM	1,132,403.14	237804.66	2.5%	181,929.70	38205.24	0.4%	0.00	0.00	0.0%
8:30 AM	801,414.26	200353.56	1.8%	73,372.33	18343.08	0.2%	0.00	0.00	0.0%
8:45 AM	606,726.07	151681.52	1.4%	25,737.41	6434.35	0.1%	0.00	0.00	0.0%
9:00 AM	468,062.37	117015.59	1.0%	5,859.03	1464.76	0.0%	0.00	0.00	0.0%
9:15 AM	375,711.01	93927.75	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	307,999.32	76999.83	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	265,227.09	66306.77	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	216,357.75	54089.44	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	187,560.78	46890.19	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	161,995.31	40498.83	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	147,098.65	36774.66	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	133,802.31	33450.58	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	128,485.54	32121.38	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	126,532.53	31633.13	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	127,440.70	31860.17	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	128,983.71	32245.93	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	133,021.99	33255.50	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	136,685.53	34171.38	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	144,127.25	36031.81	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	150,061.23	37515.31	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	160,597.78	40149.44	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	171,143.15	42785.79	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	187,754.76	46938.69	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	201,368.51	50342.13	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	226,118.39	56529.60	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	253,583.97	63395.99	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	295,390.73	73847.68	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	347,231.46	86807.86	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	434,940.56	108735.14	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	550,948.46	137737.11	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	753,038.69	135546.96	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:51 PM	881,703.68	44085.18	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

DECEMBER 6

Analysis Hours: 8:10 AM-3:51 PM (PST)

JANUARY 4 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:10 AM	1,670,296.44	66811.86	3.7%	252,114.61	10084.58	0.6%	0.00	0.00	0.0%
8:15 AM	1,433,717.73	243732.01	3.2%	230,984.19	39267.31	0.5%	0.00	0.00	0.0%
8:30 AM	953,885.69	238471.42	2.1%	112,794.03	28198.51	0.3%	0.00	0.00	0.0%
8:45 AM	710,601.50	177650.38	1.6%	43,728.90	10932.23	0.1%	0.00	0.00	0.0%
9:00 AM	545,437.71	136359.43	1.2%	25,609.56	6402.39	0.1%	0.00	0.00	0.0%
9:15 AM	433,684.11	108421.03	1.0%	4,095.59	1023.90	0.0%	0.00	0.00	0.0%
9:30 AM	352,120.59	88030.15	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	299,168.90	74792.22	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	251,556.02	62889.00	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	214,805.93	53701.48	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	184,408.63	46102.16	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	164,807.99	41202.00	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	149,148.65	37287.16	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	141,072.09	35268.02	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	135,847.90	33961.97	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	137,130.80	34282.70	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	137,126.39	34281.60	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	140,988.33	35247.08	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	144,114.02	36028.51	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	151,626.28	37906.57	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	158,001.11	39500.28	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	169,353.26	42338.31	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	181,274.11	45318.53	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	196,633.68	49158.42	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	214,219.58	53554.90	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	240,759.36	60189.84	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	269,706.22	67426.56	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	314,942.87	78735.72	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	371,121.66	92780.42	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	466,995.49	116748.87	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	588,840.38	147210.09	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	809,874.36	137678.64	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:51 PM	929,047.64	46452.38	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%

DECEMBER 13

Analysis Hours: 8:15 AM-3:52 PM (PST)

DECEMBER 28 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:15 AM	1,740,159.52	208819.14	3.9%	251,396.01	30167.52	0.6%	0.00	0.00	0.0%
8:30 AM	1,114,208.84	278552.21	2.5%	154,486.17	38621.54	0.3%	0.00	0.00	0.0%
8:45 AM	807,004.36	201751.09	1.8%	81,074.16	20268.54	0.2%	0.00	0.00	0.0%
9:00 AM	615,957.68	153989.42	1.4%	36,877.94	9219.48	0.1%	0.00	0.00	0.0%
9:15 AM	486,199.35	121549.84	1.1%	17,555.05	4388.76	0.0%	0.00	0.00	0.0%
9:30 AM	392,080.15	98020.04	0.9%	837.63	209.41	0.0%	0.00	0.00	0.0%
9:45 AM	329,557.38	82389.34	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	278,902.56	69725.64	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	239,992.26	59998.06	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	201,866.69	50466.67	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	180,767.13	45191.78	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	160,796.17	40199.04	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	152,781.33	38195.33	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	144,233.06	36058.26	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	143,148.54	35787.14	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	142,751.77	35687.94	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	146,851.76	36712.94	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	149,501.33	37375.33	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	156,272.94	39068.24	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	162,797.67	40699.42	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	174,652.40	43663.10	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	185,021.42	46255.36	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	201,275.93	50318.98	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	219,919.90	54979.98	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	248,452.36	62113.09	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	277,227.30	69306.82	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	324,438.99	81109.75	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	382,949.93	95737.48	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	476,994.19	119248.55	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	601,559.19	150389.80	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	820,820.92	147747.76	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:52 PM	960,070.96	57604.26	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%

DECEMBER 20

Analysis Hours: 8:19 AM-3:54 PM (PST)

WINTER SOLSTICE
DECEMBER 21 SIMILAR

Analysis Time	CURRENT SHADOW (PARTIAL AREA)			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:19 AM	1,764,508.22	141160.66	3.9%	250,769.99	20061.60	0.6%	0.00	0.00	0.0%
8:30 AM	1,269,378.34	266569.45	2.8%	186,602.82	39186.59	0.4%	0.00	0.00	0.0%
8:45 AM	886,381.21	221595.30	2.0%	99,268.45	24817.11	0.2%	0.00	0.00	0.0%
9:00 AM	664,774.11	166193.53	1.5%	44,297.61	11074.40	0.1%	0.00	0.00	0.0%
9:15 AM	527,406.53	131851.63	1.2%	27,452.35	6863.09	0.1%	0.00	0.00	0.0%
9:30 AM	418,258.41	104564.60	0.9%	3,641.50	910.38	0.0%	0.00	0.00	0.0%
9:45 AM	351,278.55	87819.64	0.8%	57.31	14.33	0.0%	0.00	0.00	0.0%
10:00 AM	294,636.86	73659.21	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	255,633.97	63908.49	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	214,832.38	53708.09	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	189,817.98	47454.50	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	166,950.57	41737.64	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	157,648.43	39412.11	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	148,311.01	37077.75	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	146,750.37	36687.59	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	145,180.91	36295.23	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	148,311.01	37077.75	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	150,643.16	37660.79	0.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	157,167.89	39291.97	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	163,838.10	40959.53	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	174,802.29	43700.57	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	185,925.19	46481.30	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	201,055.50	50263.88	0.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	220,519.47	55129.87	0.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	248,156.99	62039.25	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	274,555.68	68638.92	0.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	320,250.82	80062.71	0.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	375,389.19	93847.30	0.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	467,052.80	116763.20	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	582,518.44	145629.61	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	791,203.94	166152.83	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:54 PM	973,490.74	77879.26	2.2%	0.00	0.00	0.0%	0.00	0.00	0.0%

THEORETICAL ANNUAL AVAILABLE SUNLIGHT (TAAS)	GOLDEN GATE PARK
Area of Golden Gate Park	1026.83 acres (44,728,912 sf)
Hours of annual available sunlight	3721.4 hrs
TAAS for Golden Gate Park	166,454,173,117 sfh

EXISTING (CURRENT) LEVELS OF SHADOW (ROUGH APPROXIMATE)	GOLDEN GATE PARK
Existing annual total shading on park (sfh)	217,422,029 sfh
Existing shading as percentage of TAAS	0.131%

NEW SHADOW CAST BY THE PROPOSED CPHP PROJECT	GOLDEN GATE PARK
Additional annual shading on Golden Gate Park from Project	8,091,947 sfh
Additional annual shading from Project as percentage of TAAS	0.005%
Combined total annual shading existing + Project (sfh)	225,513,976 sfh
Combined total annual shading from existing + Project as percentage of TAAS	0.136%
Number of days when new shading from Project would occur	128-140 days annually
Dates when new shadow from Project would be cast on Golden Gate Park	Between Oct 12 - Feb 28
Annual range in duration of new Project shadow (duration variance +/- 6 min.)	Zero to approx. 94 min
Range in area of new Project shadow (sf)	Zero to 252,115 sf
Average daily duration of new Project shadow (when present)	Approx. 50 min.
MAXIMUM NEW SHADING BY THE PROPOSED PROJECT	GOLDEN GATE PARK
Dates of maximum new shading from proposed Project (max sfh)	Dec 20 & Dec 21
Total new shading on date(s) of maximum shading (sfh)	102,927.50 sfh
Percentage new shadow on date(s) of maximum shading	0.030%
Date and duration of longest duration of new shading (duration variance +/- 6 min.)	Approx. 94 min on Dec 20 & Dec 21
Date and time of largest area of new Project shadow	252,115 sf on Dec 6/Jan 4 at 8:10 AM
Percentage of Golden Gate Park covered by largest new shadow	0.564%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

JUNE 21

Analysis Hours: 6:46 AM-7:36 PM (PDT)

SUMMER SOLSTICE

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:46 AM	12,880.61	1416.87	19.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	9,755.77	2243.83	14.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	7,236.84	1809.21	10.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	5,820.85	1455.21	8.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	4,726.41	1181.60	7.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	3,921.99	980.50	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	3,264.75	816.19	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	3,050.05	762.51	4.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	3,101.99	775.50	4.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	3,178.36	794.59	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	3,246.38	811.59	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	3,299.99	825.00	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	3,348.48	837.12	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	3,373.75	843.44	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	3,396.04	849.01	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	3,406.95	851.74	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	3,420.41	855.10	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	3,420.48	855.12	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	3,400.69	850.17	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,363.40	840.85	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,337.49	834.37	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,294.68	823.67	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,266.73	816.68	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,217.11	804.28	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,185.52	796.38	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,128.34	782.08	4.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,230.51	807.63	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,310.87	827.72	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,415.11	853.78	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,492.74	873.18	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	3,590.49	897.62	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	3,666.22	916.55	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	3,759.06	939.76	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	3,835.44	958.86	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	3,925.80	981.45	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	4,003.95	1000.99	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	4,093.40	1023.35	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	4,175.70	1043.93	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	4,361.93	1090.48	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	4,569.95	1142.49	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	4,796.20	1199.05	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	5,044.23	1261.06	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	5,320.34	1330.08	8.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	5,632.74	1408.18	8.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	5,988.55	1497.14	9.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	6,403.18	1600.79	9.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	6,889.78	1722.45	10.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	7,694.64	1923.66	11.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	8,746.15	2186.54	13.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	11,322.80	2830.70	17.1%	0.00	0.00	0.0%	3,967.71	991.93	6.0%
7:15 PM	17,527.34	5258.20	26.5%	7,846.92	2354.08	11.8%	6,908.60	2072.58	10.4%
7:36 PM	37,200.01	6696.00	56.2%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

JUNE 28

Analysis Hours: 6:48 AM-7:36 PM (PDT)

JUNE 14 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:48 AM	12,909.14	1290.91	19.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	10,199.81	2243.96	15.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	7,502.53	1875.63	11.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	5,990.23	1497.56	9.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	4,863.96	1215.99	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	4,018.77	1004.69	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	3,335.68	833.92	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	3,058.31	764.58	4.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	3,104.02	776.01	4.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	3,179.09	794.77	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	3,248.06	812.01	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	3,302.50	825.63	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	3,351.66	837.91	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	3,378.84	844.71	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	3,401.56	850.39	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	3,412.62	853.16	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	3,426.36	856.59	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	3,426.93	856.73	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	3,410.43	852.61	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,373.13	843.28	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,346.86	836.72	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,304.52	826.13	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,276.54	819.13	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,227.07	806.77	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,195.64	798.91	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,138.77	784.69	4.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,227.59	806.90	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,308.52	827.13	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,413.20	853.30	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,491.16	872.79	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	3,589.44	897.36	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	3,665.63	916.41	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	3,759.07	939.77	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	3,835.64	958.91	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	3,926.34	981.59	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	4,004.86	1001.21	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	4,094.83	1023.71	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	4,176.52	1044.13	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	4,345.58	1086.39	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	4,552.77	1138.19	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	4,777.65	1194.41	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	5,024.59	1256.15	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	5,298.83	1324.71	8.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	5,608.82	1402.21	8.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	5,961.68	1490.42	9.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	6,372.33	1593.08	9.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	6,854.05	1713.51	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	7,623.40	1905.85	11.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	8,695.25	2173.81	13.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	11,055.93	2763.98	16.7%	0.00	0.00	0.0%	2,360.22	590.06	3.6%
7:15 PM	17,061.41	5118.42	25.8%	7,657.30	2297.19	11.6%	8,535.75	2560.73	12.9%
7:36 PM	37,107.09	6679.28	56.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

JULY 5

Analysis Hours: 6:52 AM-7:36 PM (PDT)

JUNE 7 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:52 AM	12,995.97	779.76	19.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	10,958.11	2082.04	16.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	7,975.73	1993.93	12.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	6,274.41	1568.60	9.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	5,078.32	1269.58	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	4,155.64	1038.91	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	3,431.63	857.91	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	3,095.37	773.84	4.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	3,127.76	781.94	4.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	3,198.25	799.56	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	3,268.40	817.10	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	3,321.85	830.46	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	3,371.12	842.78	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	3,400.37	850.09	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	3,422.67	855.67	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	3,433.62	858.41	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	3,447.23	861.81	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	3,447.59	861.90	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	3,434.21	858.55	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,396.45	849.11	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,369.81	842.45	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,327.09	831.77	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,298.77	824.69	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,249.32	812.33	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,217.55	804.39	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,161.04	790.26	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,240.25	810.06	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,322.07	830.52	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,427.44	856.86	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,506.52	876.63	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	3,605.62	901.41	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	3,682.86	920.71	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	3,777.30	944.33	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	3,855.04	963.76	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	3,947.10	986.78	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	4,026.70	1006.67	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	4,118.39	1029.60	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	4,201.45	1050.36	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	4,339.43	1084.86	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	4,547.43	1136.86	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	4,773.16	1193.29	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	5,021.53	1255.38	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	5,296.36	1324.09	8.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	5,607.89	1401.97	8.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	5,962.81	1490.70	9.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	6,375.95	1593.99	9.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	6,861.06	1715.26	10.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	7,652.81	1913.20	11.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	8,764.20	2191.05	13.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	11,092.43	2773.11	16.7%	0.00	0.00	0.0%	2,571.67	642.92	3.9%
7:15 PM	17,188.30	5156.49	25.9%	9,206.44	2761.93	13.9%	11,369.24	3410.77	17.2%
7:36 PM	36,822.99	6628.14	55.6%	98.18	17.67	0.1%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

JULY 12

Analysis Hours: 6:56 AM-7:33 PM (PDT)

MAY 31 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:56 AM	13,137.41	394.12	19.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	12,104.21	1815.63	18.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	8,735.17	2183.79	13.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	6,695.89	1673.97	10.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	5,381.04	1345.26	8.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	4,337.53	1084.38	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	3,557.61	889.40	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	3,170.79	792.70	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	3,174.82	793.70	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	3,236.47	809.12	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	3,305.00	826.25	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	3,358.72	839.68	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	3,407.79	851.95	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	3,438.27	859.57	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	3,459.92	864.98	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	3,469.84	867.46	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	3,482.79	870.70	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	3,482.54	870.63	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	3,472.05	868.01	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,433.20	858.30	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,405.73	851.43	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,362.31	840.58	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,333.21	833.30	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,283.71	820.93	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,251.12	812.78	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,194.82	798.71	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,268.25	817.06	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,351.73	837.93	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,458.09	864.52	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,538.67	884.67	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	3,639.07	909.77	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	3,717.91	929.48	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	3,814.28	953.57	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	3,893.59	973.40	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	3,987.95	996.99	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	4,069.61	1017.40	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	4,164.14	1041.04	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	4,250.02	1062.51	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	4,349.68	1087.42	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	4,554.21	1138.55	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	4,783.34	1195.84	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	5,035.86	1258.97	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	5,314.30	1328.58	8.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	5,630.65	1407.66	8.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	5,992.35	1498.09	9.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	6,414.41	1603.60	9.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	6,911.68	1727.92	10.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	7,790.68	1947.67	11.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	8,960.59	2240.15	13.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	11,452.27	2863.07	17.3%	0.00	0.00	0.0%	5,977.15	1494.29	9.0%
7:15 PM	18,236.83	5106.31	27.5%	13,188.47	3692.77	19.9%	15,219.84	4261.56	23.0%
7:33 PM	36,527.36	5479.10	55.1%	1,941.92	291.29	2.9%	261.97	39.30	0.4%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

JULY 19

Analysis Hours: 7:01 AM-7:30 PM (PDT)

MAY 24 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:01 AM	13,322.25	1731.89	20.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:16 AM	9,518.57	2284.46	14.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	7,335.70	1760.57	11.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	5,761.86	1440.47	8.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	4,558.08	1139.52	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	3,774.54	943.63	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	3,303.15	825.79	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	3,248.12	812.03	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	3,295.20	823.80	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	3,361.94	840.49	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	3,414.28	853.57	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	3,461.95	865.49	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	3,493.30	873.33	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	3,513.43	878.36	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	3,521.57	880.39	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	3,533.33	883.33	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	3,531.95	882.99	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	3,523.50	880.87	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,483.09	870.77	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,454.15	863.54	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,409.65	852.41	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,379.51	844.88	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,329.38	832.34	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,295.76	823.94	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,239.31	809.83	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,313.00	828.25	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,398.66	849.67	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,506.07	876.52	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,588.75	897.19	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	3,690.87	922.72	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	3,771.94	942.99	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	3,870.59	967.65	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	3,952.41	988.10	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	4,049.76	1012.44	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	4,134.59	1033.65	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	4,233.11	1058.28	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	4,322.98	1080.74	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	4,425.36	1106.34	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	4,576.22	1144.05	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	4,810.94	1202.74	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	5,069.38	1267.34	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	5,357.01	1339.25	8.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	5,682.27	1420.57	8.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	6,056.87	1514.22	9.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	6,495.55	1623.89	9.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	7,015.66	1753.91	10.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	8,032.50	2008.12	12.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	9,371.05	2342.76	14.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	12,224.00	3056.00	18.5%	65.90	16.47	0.1%	15,255.56	3813.89	23.0%
7:15 PM	20,358.14	5089.53	30.7%	20,338.65	5084.66	30.7%	19,685.12	4921.28	29.7%
7:30 PM	36,558.30	4752.58	55.2%	5,905.33	767.69	8.9%	3,118.92	405.46	4.7%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

JULY 26

Analysis Hours: 7:07 AM-7:25 PM (PDT)

MAY 17 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:07 AM	13,487.62	809.26	20.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	11,244.52	2136.46	17.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	8,175.32	2043.83	12.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	6,245.21	1561.30	9.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	4,866.65	1216.66	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	4,078.32	1019.58	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	3,536.18	884.05	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	3,349.41	837.35	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	3,376.44	844.11	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	3,438.72	859.68	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	3,488.73	872.18	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	3,534.22	883.55	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	3,565.50	891.38	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	3,583.30	895.83	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	3,589.01	897.25	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	3,598.88	899.72	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	3,595.52	898.88	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	3,588.64	897.16	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,545.86	886.46	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,515.29	878.82	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,469.31	867.33	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,437.50	859.38	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,386.57	846.64	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,351.62	837.91	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,294.75	823.69	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,374.17	843.54	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,461.93	865.48	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,570.96	892.74	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,656.05	914.01	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	3,760.28	940.07	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	3,844.24	961.06	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	3,945.97	986.49	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	4,030.98	1007.75	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	4,132.29	1033.07	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	4,221.21	1055.30	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	4,324.78	1081.20	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	4,420.02	1105.01	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	4,529.23	1132.31	6.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	4,634.27	1158.57	7.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	4,855.31	1213.83	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	5,123.43	1280.86	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	5,423.32	1355.83	8.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	5,763.23	1440.81	8.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	6,155.45	1538.86	9.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	6,619.14	1654.79	10.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	7,213.80	1803.45	10.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	8,445.36	2111.34	12.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	10,122.96	2530.74	15.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	13,624.78	3406.20	20.6%	799.73	199.93	1.2%	30,710.03	7677.51	46.4%
7:15 PM	24,131.78	5067.67	36.4%	30,060.13	6312.63	45.4%	24,146.41	5070.75	36.4%
7:25 PM	36,862.51	3317.63	55.6%	13,690.08	1232.11	20.7%	9,006.44	810.58	13.6%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

AUGUST 2

Analysis Hours: 7:12 AM-7:18 PM (PDT)

MAY 10 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:12 AM	13,776.27	275.53	20.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	13,041.93	1956.29	19.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	9,347.55	2336.89	14.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	6,837.81	1709.45	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	5,383.46	1345.87	8.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	4,446.68	1111.67	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	3,813.91	953.48	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	3,483.25	870.81	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	3,484.25	871.06	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	3,537.75	884.44	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	3,583.24	895.81	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	3,625.16	906.29	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	3,653.24	913.31	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	3,669.66	917.42	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	3,671.99	918.00	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	3,679.31	919.83	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	3,673.33	918.33	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	3,666.42	916.61	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,620.90	905.22	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,588.10	897.03	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,540.03	885.01	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,506.48	876.62	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,454.25	863.56	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,417.65	854.41	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,360.00	840.00	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,453.01	863.25	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,543.44	885.86	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,654.11	913.53	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,742.07	935.52	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	3,848.79	962.20	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	3,936.14	984.04	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,041.59	1010.40	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	4,130.84	1032.71	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	4,237.24	1059.31	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	4,331.41	1082.85	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	4,441.60	1110.40	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	4,543.75	1135.94	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	4,661.77	1165.44	7.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	4,776.41	1194.10	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	4,926.07	1231.52	7.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	5,203.85	1300.96	7.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	5,520.55	1380.14	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	5,882.19	1470.55	8.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	6,300.68	1575.17	9.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	6,800.09	1700.02	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	7,647.77	1911.94	11.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	9,033.08	2258.27	13.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	11,319.48	2829.87	17.1%	0.00	0.00	0.0%	1,780.14	445.03	2.7%
7:00 PM	16,605.30	4151.32	25.1%	15,014.99	3753.75	22.7%	47,733.67	11933.42	72.1%
7:15 PM	31,875.20	4781.28	48.1%	30,116.69	4517.50	45.5%	25,504.83	3825.73	38.5%
7:18 PM	37,322.42	1119.67	56.3%	23,735.56	712.07	35.8%	18,734.02	562.02	28.3%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

AUGUST 9

Analysis Hours: 7:19 AM-7:10 PM (PDT)

MAY 3 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:19 AM	14,245.38	1282.08	21.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	10,870.57	2282.82	16.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	7,745.75	1936.44	11.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	6,032.68	1508.17	9.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	4,885.70	1221.42	7.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	4,148.89	1037.22	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	3,664.70	916.18	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	3,620.88	905.22	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	3,658.48	914.62	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	3,697.98	924.49	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	3,734.90	933.72	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	3,757.84	939.46	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	3,772.64	943.16	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	3,770.44	942.61	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	3,774.52	943.63	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	3,764.95	941.24	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	3,757.30	939.33	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,708.25	927.06	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,672.62	918.16	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,622.09	905.52	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,586.36	896.59	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,532.61	883.15	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,494.02	873.51	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,435.70	858.93	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,548.75	887.19	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,642.06	910.51	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,754.90	938.72	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,845.99	961.50	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	3,955.89	988.97	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,047.52	1011.88	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,157.16	1039.29	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	4,251.89	1062.97	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	4,364.20	1091.05	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	4,465.02	1116.26	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	4,583.41	1145.85	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	4,694.22	1173.55	7.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	4,823.39	1205.85	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	4,950.26	1237.57	7.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	5,097.44	1274.36	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	5,310.48	1327.62	8.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	5,649.82	1412.46	8.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	6,039.70	1509.92	9.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	6,496.66	1624.17	9.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	7,056.20	1764.05	10.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	8,301.00	2075.25	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	10,019.00	2504.75	15.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	13,445.43	4571.45	20.3%	0.00	0.00	0.0%	16,621.06	5651.16	25.1%
7:10 PM	37,757.30	7929.03	57.0%	28,198.34	5921.65	42.6%	26,568.25	5579.33	40.1%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

AUGUST 16

Analysis Hours: 7:25 AM-7:02 PM (PDT)

APRIL 26 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:25 AM	14,542.43	581.70	22.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	12,910.20	2194.73	19.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	8,974.68	2243.67	13.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	6,823.36	1705.84	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	5,425.58	1356.39	8.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	4,549.56	1137.39	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	3,943.37	985.84	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	3,787.66	946.91	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	3,801.28	950.32	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	3,832.64	958.16	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	3,863.30	965.83	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	3,880.05	970.01	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	3,891.89	972.97	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	3,884.29	971.07	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	3,884.20	971.05	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	3,870.55	967.64	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	3,860.91	965.23	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,807.91	951.98	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,768.93	942.23	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,715.67	928.92	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,677.37	919.34	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,621.56	905.39	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,581.09	895.27	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,540.89	885.22	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,660.80	915.20	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,757.23	939.31	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,872.54	968.13	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,967.43	991.86	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,081.04	1020.26	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,177.51	1044.38	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,292.59	1073.15	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	4,393.45	1098.36	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	4,513.05	1128.26	6.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	4,622.14	1155.54	7.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	4,750.41	1187.60	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	4,872.52	1218.13	7.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	5,015.26	1253.82	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	5,157.62	1289.41	7.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	5,324.31	1331.08	8.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	5,499.15	1374.79	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	5,813.02	1453.26	8.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	6,240.15	1560.04	9.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	6,747.23	1686.81	10.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	7,616.50	1904.12	11.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	9,108.39	2277.10	13.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	11,572.93	2893.23	17.5%	0.00	0.00	0.0%	414.47	103.62	0.6%
6:45 PM	17,068.84	4608.59	25.8%	7,804.03	2107.09	11.8%	31,476.32	8498.61	47.5%
7:02 PM	37,300.43	5222.06	56.3%	28,936.72	4051.14	43.7%	28,076.12	3930.66	42.4%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

AUGUST 23

Analysis Hours: 7:31 AM-6:52 PM (PDT)

APRIL 19 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:31 AM	14,828.99	1631.19	22.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	10,629.30	2444.74	16.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	7,743.01	1935.75	11.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	6,092.71	1523.18	9.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	5,013.01	1253.25	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	4,298.32	1074.58	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	3,984.46	996.12	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	3,968.94	992.24	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	3,988.49	997.12	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	4,010.92	1002.73	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	4,019.94	1004.99	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	4,027.32	1006.83	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	4,013.26	1003.32	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,008.23	1002.06	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	3,989.71	997.43	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	3,976.22	994.05	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,918.57	979.64	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,875.89	968.97	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,819.50	954.87	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,778.25	944.56	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,720.27	930.07	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,677.48	919.37	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,668.95	917.24	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,791.59	947.90	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,891.27	972.82	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	4,009.84	1002.46	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	4,108.84	1027.21	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,226.80	1056.70	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,328.85	1082.21	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,450.62	1112.66	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	4,558.98	1139.74	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	4,687.73	1171.93	7.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	4,806.65	1201.66	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	4,947.68	1236.92	7.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	5,083.07	1270.77	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	5,243.18	1310.79	7.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	5,405.48	1351.37	8.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	5,597.16	1399.29	8.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	5,802.10	1450.53	8.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	6,048.37	1512.09	9.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	6,502.53	1625.63	9.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	7,138.86	1784.72	10.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	8,500.13	2125.03	12.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	10,514.84	2628.71	15.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	14,502.89	3625.72	21.9%	0.00	0.00	0.0%	3,100.06	775.01	4.7%
6:45 PM	24,538.11	4662.24	37.0%	23,813.25	4524.52	35.9%	20,690.88	3931.27	31.2%
6:52 PM	37,950.03	2277.00	57.3%	22,393.97	1343.64	33.8%	19,603.72	1176.22	29.6%

AUGUST 30

Analysis Hours: 7:37 AM-6:42 PM (PDT)

APRIL 12 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:37 AM	15,151.71	909.10	22.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	12,608.64	2395.64	19.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	8,947.98	2236.99	13.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	6,895.17	1723.79	10.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	5,556.63	1389.16	8.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	4,708.59	1177.15	7.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	4,218.02	1054.50	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	4,163.06	1040.76	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	4,165.05	1041.26	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	4,177.45	1044.36	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	4,177.05	1044.26	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	4,179.19	1044.80	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	4,157.54	1039.38	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,146.71	1036.68	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,122.29	1030.57	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,104.05	1026.01	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,041.18	1010.30	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,994.28	998.57	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,934.39	983.60	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,890.09	972.52	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,829.43	957.36	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,784.44	946.11	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,813.59	953.40	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,938.64	984.66	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	4,042.01	1010.50	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	4,164.21	1041.05	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	4,268.05	1067.01	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,391.44	1097.86	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,500.05	1125.01	6.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,629.68	1157.42	7.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	4,747.02	1186.75	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	4,886.52	1221.63	7.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	5,017.80	1254.45	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	5,173.36	1293.34	7.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	5,326.29	1331.57	8.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	5,507.92	1376.98	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	5,694.97	1423.74	8.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	5,918.60	1479.65	8.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	6,162.03	1540.51	9.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	6,459.31	1614.83	9.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	6,836.28	1709.07	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	7,949.43	1987.36	12.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	9,635.31	2408.83	14.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	12,774.27	3193.57	19.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	19,675.43	4525.35	29.7%	169.62	39.01	0.3%	173.40	39.88	0.3%
6:42 PM	40,242.10	4426.63	60.7%	9,832.17	1081.54	14.8%	6,346.19	698.08	9.6%

SEPTEMBER 6

Analysis Hours: 7:44 AM-6:31 PM (PDT)

APRIL 5 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:44 AM	15,505.27	2015.69	23.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	10,489.11	2622.28	15.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	7,862.86	1965.71	11.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	6,192.74	1548.18	9.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	5,185.31	1296.33	7.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	4,504.77	1126.19	6.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	4,385.42	1096.36	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	4,362.84	1090.71	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	4,363.46	1090.87	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	4,352.10	1088.03	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	4,347.44	1086.86	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	4,316.95	1079.24	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,299.41	1074.85	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,268.59	1067.15	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,244.50	1061.12	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,175.82	1043.96	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,124.33	1031.08	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	4,060.43	1015.11	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	4,013.05	1003.26	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,949.70	987.43	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,902.01	975.50	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,973.98	993.49	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	4,101.99	1025.50	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	4,209.47	1052.37	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	4,336.34	1084.09	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	4,445.55	1111.39	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,575.21	1143.80	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,691.73	1172.93	7.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,830.69	1207.67	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	4,958.89	1239.72	7.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,111.34	1277.83	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	5,257.37	1314.34	7.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	5,431.36	1357.84	8.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	5,605.26	1401.32	8.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	5,813.40	1453.35	8.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	6,031.77	1507.94	9.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	6,296.25	1574.06	9.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	6,589.89	1647.47	9.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	6,954.50	1738.62	10.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	7,610.34	1902.59	11.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	9,033.43	2258.36	13.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	11,750.11	2937.53	17.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	16,414.59	4431.94	24.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:31 PM	43,156.75	6041.94	65.1%	0.00	0.00	0.0%	0.00	0.00	0.0%

SEPTEMBER 13

Analysis Hours: 7:50 AM-6:21 PM (PDT)

MARCH 29 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:50 AM	16,021.95	1281.76	24.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	12,615.43	2649.24	19.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	9,037.01	2259.25	13.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	7,022.59	1755.65	10.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	5,754.13	1438.53	8.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	4,907.43	1226.86	7.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	4,637.45	1159.36	7.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	4,582.67	1145.67	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	4,569.07	1142.27	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	4,545.00	1136.25	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	4,532.08	1133.02	6.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	4,491.84	1122.96	6.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,466.50	1116.62	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,428.38	1107.09	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,397.51	1099.38	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,322.34	1080.59	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,266.07	1066.52	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	4,197.86	1049.47	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	4,146.98	1036.74	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	4,080.55	1020.14	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	4,040.73	1010.18	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	4,150.19	1037.55	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	4,281.80	1070.45	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	4,393.86	1098.46	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	4,526.11	1131.53	6.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	4,641.62	1160.41	7.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,779.02	1194.75	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,904.53	1226.13	7.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	5,054.91	1263.73	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	5,195.78	1298.95	7.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,364.25	1341.06	8.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	5,528.07	1382.02	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	5,724.14	1431.03	8.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	5,924.14	1481.04	8.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	6,165.36	1541.34	9.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	6,423.62	1605.91	9.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	6,740.35	1685.09	10.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	7,099.57	1774.89	10.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	7,647.15	1911.79	11.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	8,868.66	2217.17	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	11,070.01	2767.50	16.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	14,919.71	3729.93	22.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	31,858.61	5734.55	48.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:21 PM	46,440.41	2322.02	70.1%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

SEPTEMBER 20

Analysis Hours: 7:57 AM-6:09 PM (PDT)

APPROXIMATE EQUINOXES
MARCH 22 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:57 AM	18,667.41	373.35	28.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	17,053.39	2558.01	25.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	11,145.37	2786.34	16.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	8,272.23	2068.06	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	6,625.09	1656.27	10.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	5,499.43	1374.86	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	4,946.59	1236.65	7.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	4,822.95	1205.74	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	4,795.22	1198.80	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	4,756.09	1189.02	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	4,733.20	1183.30	7.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	4,682.17	1170.54	7.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,648.27	1162.07	7.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,602.09	1150.52	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,563.39	1140.85	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,481.00	1120.25	6.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,419.59	1104.90	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	4,346.80	1086.70	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	4,292.34	1073.08	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	4,222.69	1055.67	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	4,226.29	1056.57	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	4,342.30	1085.57	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	4,477.82	1119.46	6.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	4,594.82	1148.70	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	4,733.43	1183.36	7.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	4,856.30	1214.07	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	5,002.86	1250.71	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	5,139.05	1284.76	7.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	5,302.73	1325.68	8.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	5,458.79	1364.70	8.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,646.05	1411.51	8.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	5,831.38	1457.84	8.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	6,055.18	1513.80	9.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	6,286.85	1571.71	9.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	6,569.66	1642.42	9.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	6,877.87	1719.47	10.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	7,262.25	1815.56	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	7,731.93	1932.98	11.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	8,853.55	2213.39	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	10,789.23	2697.31	16.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	14,201.48	3550.37	21.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	25,559.55	5367.51	38.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:09 PM	52,637.25	4210.98	79.5%	0.00	0.00	0.0%	0.00	0.00	0.0%

SEPTEMBER 27

Analysis Hours: 8:03 AM-5:58 PM (PDT)

MARCH 15 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:03 AM	22,514.77	2251.48	34.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	15,925.99	3503.72	24.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	11,023.24	2755.81	16.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	8,375.32	2093.83	12.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	6,713.41	1678.35	10.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	5,767.82	1441.95	8.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	5,370.36	1342.59	8.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	5,173.81	1293.45	7.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	5,032.65	1258.16	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	4,954.19	1238.55	7.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	4,886.92	1221.73	7.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,844.84	1211.21	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,789.57	1197.39	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,747.85	1186.96	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,657.28	1164.32	7.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,585.26	1146.32	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	4,507.44	1126.86	6.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	4,449.32	1112.33	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	4,376.12	1094.03	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	4,433.17	1108.29	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	4,555.27	1138.82	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	4,692.34	1173.08	7.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	4,812.28	1203.07	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	4,958.35	1239.59	7.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	5,089.57	1272.39	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	5,247.43	1311.86	7.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	5,395.76	1348.94	8.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	5,575.42	1393.86	8.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	5,749.03	1437.26	8.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,958.85	1489.71	9.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	6,170.22	1542.55	9.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	6,427.27	1606.82	9.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	6,698.09	1674.52	10.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	7,032.68	1758.17	10.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	7,404.84	1851.21	11.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	7,893.74	1973.43	11.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	8,830.07	2207.52	13.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	10,518.86	2629.71	15.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	13,558.01	3389.50	20.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	19,923.21	4582.34	30.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:58 PM	57,268.58	6299.54	86.4%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

OCTOBER 4

Analysis Hours: 8:09 AM-5:47 PM (PDT)

MARCH 8 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:09 AM	26,570.11	1062.80	40.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	23,047.70	3918.11	34.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	15,281.89	3820.47	23.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	11,385.53	2846.38	17.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	8,743.77	2185.94	13.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	7,191.93	1797.98	10.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	6,399.39	1599.85	9.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	6,013.48	1503.37	9.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	5,680.68	1420.17	8.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,472.80	1368.20	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,258.27	1314.57	7.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	5,143.95	1285.99	7.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	5,022.65	1255.66	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,968.53	1242.13	7.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,885.26	1221.32	7.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,828.32	1207.08	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	4,743.32	1185.83	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	4,681.09	1170.27	7.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	4,586.16	1146.54	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	4,667.55	1166.89	7.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	4,758.79	1189.70	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	4,908.91	1227.23	7.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	5,043.61	1260.90	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	5,198.39	1299.60	7.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	5,339.21	1334.80	8.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	5,510.01	1377.50	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	5,672.16	1418.04	8.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	5,870.06	1467.51	8.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	6,064.46	1516.12	9.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	6,300.98	1575.25	9.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	6,542.66	1635.67	9.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	6,839.51	1709.88	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	7,158.11	1789.53	10.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	7,556.72	1889.18	11.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	8,026.94	2006.74	12.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	8,873.66	2218.42	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	10,256.06	2564.01	15.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	12,894.16	3223.54	19.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	17,070.97	4609.16	25.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:47 PM	61,747.90	8644.71	93.2%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

OCTOBER 11

Analysis Hours: 8:16 AM-5:37 PM (PDT)

MARCH 1 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:16 AM	30,626.09	3675.13	46.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	21,369.58	5128.70	32.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	15,463.50	3865.87	23.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	11,552.69	2888.17	17.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	9,352.99	2338.25	14.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	7,941.83	1985.46	12.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	7,289.06	1822.26	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	6,737.02	1684.26	10.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	6,369.59	1592.40	9.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	6,019.69	1504.92	9.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	5,771.57	1442.89	8.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	5,521.25	1380.31	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	5,409.63	1352.41	8.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	5,261.35	1315.34	7.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	5,182.78	1295.70	7.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	5,063.61	1265.90	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	4,996.35	1249.09	7.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	4,905.22	1226.30	7.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	5,033.68	1258.42	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	5,134.06	1283.51	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	5,273.64	1318.41	8.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	5,383.25	1345.81	8.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	5,536.80	1384.20	8.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	5,664.55	1416.14	8.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	5,841.16	1460.29	8.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	5,997.45	1499.36	9.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	6,209.83	1552.46	9.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	6,408.59	1602.15	9.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	6,671.98	1667.99	10.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	6,948.80	1737.20	10.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	7,293.01	1823.25	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	7,668.89	1917.22	11.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	8,148.32	2037.08	12.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	8,885.18	2221.30	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	10,089.20	2522.30	15.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	12,210.93	3052.73	18.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	15,965.19	3991.30	24.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	40,277.48	7652.72	60.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:37 PM	64,252.75	3855.17	97.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

OCTOBER 18

Analysis Hours: 8:22 AM-5:27 PM (PDT)

FEBRUARY 22 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:22 AM	34,574.71	2074.48	52.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	29,097.92	5237.63	43.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	20,961.09	5240.27	31.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	15,458.43	3864.61	23.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	12,137.26	3034.32	18.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	10,019.34	2504.83	15.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	8,926.25	2231.56	13.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	8,129.33	2032.33	12.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	7,619.22	1904.80	11.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	7,153.88	1788.47	10.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	6,805.13	1701.28	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	6,396.45	1599.11	9.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	6,178.59	1544.65	9.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	5,904.95	1476.24	8.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	5,742.66	1435.67	8.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	5,569.73	1392.43	8.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	5,482.26	1370.57	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	5,409.17	1352.29	8.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	5,523.81	1380.95	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	5,593.32	1398.33	8.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	5,724.71	1431.18	8.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	5,814.16	1453.54	8.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	5,963.52	1490.88	9.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	6,088.71	1522.18	9.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	6,285.34	1571.33	9.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	6,463.00	1615.75	9.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	6,707.41	1676.85	10.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	6,942.90	1735.72	10.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	7,251.97	1812.99	10.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	7,566.77	1891.69	11.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	7,980.61	1995.15	12.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	8,429.61	2107.40	12.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	9,155.95	2288.99	13.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	10,258.45	2564.61	15.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	11,950.14	2987.54	18.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	15,253.06	3813.26	23.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	24,610.25	5414.26	37.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:27 PM	66,020.20	6602.02	99.7%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

OCTOBER 25

Analysis Hours: 7:30 AM-4:18 PM (PST)

FEBRUARY 15 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:30 AM	38,536.57	5009.75	58.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	27,644.09	6911.02	41.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	20,663.98	5166.00	31.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	15,756.00	3939.00	23.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	12,724.65	3181.16	19.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	11,000.19	2750.05	16.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	9,866.16	2466.54	14.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	9,135.96	2283.99	13.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	8,519.10	2129.78	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	8,083.17	2020.79	12.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	7,576.00	1894.00	11.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	7,279.28	1819.82	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	6,893.82	1723.45	10.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	6,665.47	1666.37	10.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	6,378.69	1594.67	9.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	6,243.97	1560.99	9.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	6,105.34	1526.33	9.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	6,181.48	1545.37	9.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	6,192.89	1548.22	9.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	6,304.59	1576.15	9.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	6,360.82	1590.20	9.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	6,503.04	1625.76	9.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	6,622.83	1655.71	10.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	6,848.36	1712.09	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	7,054.41	1763.60	10.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	7,350.29	1837.57	11.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	7,627.83	1906.96	11.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	8,008.18	2002.05	12.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	8,398.02	2099.51	12.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	8,964.62	2241.16	13.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	9,636.73	2409.18	14.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	10,929.47	2732.37	16.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	12,289.66	3072.41	18.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	15,216.68	3804.17	23.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	20,146.79	5036.70	30.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	66,247.60	9937.14	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:18 PM	66,248.87	1987.47	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

NOVEMBER 1

Analysis Hours: 7:36 AM-4:10 PM (PST)

FEBRUARY 8 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:36 AM	42,431.08	2970.18	64.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	35,424.75	6730.70	53.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	26,466.68	6616.67	40.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	20,144.36	5036.09	30.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	16,062.70	4015.67	24.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	13,605.23	3401.31	20.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	11,939.09	2984.77	18.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	10,940.58	2735.14	16.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	10,095.73	2523.93	15.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	9,556.07	2389.02	14.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	8,908.80	2227.20	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	8,530.78	2132.70	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	8,076.68	2019.17	12.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	7,806.83	1951.71	11.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	7,471.87	1867.97	11.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	7,295.25	1823.81	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	7,120.26	1780.07	10.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	7,167.49	1791.87	10.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	7,102.82	1775.70	10.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	7,191.91	1797.98	10.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	7,209.78	1802.45	10.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	7,349.12	1837.28	11.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	7,435.55	1858.89	11.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	7,711.31	1927.83	11.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	7,942.91	1985.73	12.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	8,335.19	2083.80	12.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	8,682.49	2170.62	13.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	9,247.34	2311.83	14.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	9,793.94	2448.49	14.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	10,685.55	2671.39	16.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	11,789.14	2947.29	17.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	13,416.31	3354.08	20.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	15,506.59	3876.65	23.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	19,615.15	4903.79	29.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	52,696.36	11066.24	79.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:10 PM	66,248.86	5962.40	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

NOVEMBER 8

Analysis Hours: 7:43 AM-4:03 PM (PST)

FEBRUARY 1 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:43 AM	46,071.86	460.72	69.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	45,003.54	5850.46	67.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	33,180.95	8295.24	50.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	25,565.31	6391.33	38.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	19,781.25	4945.31	29.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	16,613.39	4153.35	25.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	14,313.81	3578.45	21.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	12,966.38	3241.59	19.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	11,874.84	2968.71	17.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	11,183.45	2795.86	16.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	10,403.50	2600.88	15.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	9,923.09	2480.77	15.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	9,369.98	2342.50	14.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	9,040.50	2260.12	13.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	8,646.69	2161.67	13.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	8,449.60	2112.40	12.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	8,282.11	2070.53	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	8,321.85	2080.46	12.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	8,231.53	2057.88	12.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	8,339.07	2084.77	12.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	8,358.95	2089.74	12.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	8,537.87	2134.47	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	8,614.61	2153.65	13.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	8,949.48	2237.37	13.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	9,208.39	2302.10	13.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	9,687.64	2421.91	14.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	10,126.41	2531.60	15.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	10,892.23	2723.06	16.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	11,616.05	2904.01	17.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	12,758.62	3189.66	19.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	14,232.93	3558.23	21.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	16,051.29	4012.82	24.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	19,244.19	4811.05	29.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	24,492.73	6123.18	37.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	66,248.87	9937.33	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:03 PM	66,248.86	1987.47	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

NOVEMBER 15

Analysis Hours: 7:51 AM-3:57 PM (PST)

JANUARY 25 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:51 AM	49,293.22	3943.46	74.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	40,946.22	8189.24	61.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	31,667.27	7916.82	47.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	24,154.39	6038.60	36.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	19,876.01	4969.00	30.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	16,867.07	4216.77	25.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	15,123.40	3780.85	22.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	13,745.97	3436.49	20.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	12,916.82	3229.20	19.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	11,995.34	2998.83	18.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	11,381.18	2845.30	17.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	10,739.85	2684.96	16.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	10,344.86	2586.21	15.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	9,880.39	2470.10	14.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	9,648.78	2412.20	14.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	9,457.96	2364.49	14.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	9,485.77	2371.44	14.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	9,386.37	2346.59	14.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	9,515.15	2378.79	14.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	9,544.59	2386.15	14.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	9,775.96	2443.99	14.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	9,883.57	2470.89	14.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	10,260.23	2565.06	15.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	10,556.42	2639.11	15.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	11,095.22	2773.80	16.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	11,628.70	2907.18	17.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	12,545.85	3136.46	18.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	13,457.44	3364.36	20.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	14,864.65	3716.16	22.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	16,541.89	4135.47	25.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	18,966.52	4741.63	28.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	23,038.48	5759.62	34.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	48,245.68	11096.51	72.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:57 PM	66,248.87	7287.38	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

NOVEMBER 22

Analysis Hours: 7:57 AM-3:54 PM (PST)

JANUARY 18 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:57 AM	51,515.16	1030.30	77.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	49,683.49	7452.52	75.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	38,191.59	9547.90	57.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	29,203.84	7300.96	44.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	23,488.79	5872.20	35.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	19,615.00	4903.75	29.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	17,347.09	4336.77	26.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	15,626.89	3906.72	23.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	14,620.70	3655.18	22.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	13,589.41	3397.35	20.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	12,848.27	3212.07	19.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	12,101.19	3025.30	18.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	11,634.50	2908.63	17.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	11,102.05	2775.51	16.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	10,835.05	2708.76	16.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	10,605.95	2651.49	16.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	10,621.83	2655.46	16.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	10,504.30	2626.08	15.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	10,640.41	2660.10	16.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	10,658.84	2664.71	16.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	10,919.64	2729.91	16.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	11,056.70	2764.17	16.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	11,472.59	2868.15	17.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	11,802.83	2950.71	17.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	12,415.64	3103.91	18.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	13,044.94	3261.24	19.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	14,108.07	3527.02	21.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	15,168.26	3792.07	22.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	16,782.02	4195.51	25.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	18,609.23	4652.31	28.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	21,635.59	5408.90	32.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	28,343.02	7085.76	42.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	66,248.86	13249.77	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:54 PM	66,248.87	5299.91	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

NOVEMBER 29

Analysis Hours: 8:04 AM-3:51 PM (PST)

JANUARY 11 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:04 AM	53,176.63	4785.90	80.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	44,920.67	9433.34	67.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	34,785.81	8696.45	52.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	27,337.91	6834.48	41.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	22,481.43	5620.36	33.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	19,552.52	4888.13	29.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	17,430.62	4357.66	26.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	16,205.44	4051.36	24.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	15,058.41	3764.60	22.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	14,211.21	3552.80	21.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	13,365.88	3341.47	20.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	12,836.25	3209.06	19.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	12,228.66	3057.16	18.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	11,914.80	2978.70	18.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	11,630.64	2907.66	17.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	11,641.53	2910.38	17.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	11,511.90	2877.97	17.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	11,656.50	2914.13	17.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	11,654.89	2913.72	17.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	11,927.11	2981.78	18.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	12,087.59	3021.90	18.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	12,532.14	3133.03	18.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	12,889.15	3222.29	19.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	13,562.16	3390.54	20.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	14,262.82	3565.71	21.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	15,418.00	3854.50	23.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	16,569.34	4142.34	25.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	18,339.95	4584.99	27.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	20,279.34	5069.83	30.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	25,363.66	6340.92	38.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	50,622.07	12655.52	76.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	66,248.85	11924.79	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:51 PM	66,248.87	3312.44	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

DECEMBER 6

Analysis Hours: 8:10 AM-3:51 PM (PST)

JANUARY 4 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:10 AM	54,550.12	2182.00	82.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	50,963.20	8663.74	76.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	40,096.30	10024.08	60.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	31,260.94	7815.24	47.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	25,364.14	6341.03	38.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	21,597.00	5399.25	32.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	19,036.28	4759.07	28.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	17,584.20	4396.05	26.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	16,310.76	4077.69	24.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	15,376.78	3844.20	23.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	14,435.84	3608.96	21.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	13,847.86	3461.96	20.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	13,172.55	3293.14	19.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	12,816.96	3204.24	19.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	12,465.81	3116.45	18.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	12,476.65	3119.16	18.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	12,307.34	3076.83	18.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	12,436.19	3109.05	18.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	12,437.41	3109.35	18.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	12,711.27	3177.82	19.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	12,876.93	3219.23	19.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	13,336.63	3334.16	20.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	13,707.32	3426.83	20.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	14,411.32	3602.83	21.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	15,142.20	3785.55	22.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	16,352.91	4088.23	24.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	17,560.66	4390.17	26.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	19,411.77	4852.94	29.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	21,448.98	5362.24	32.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	32,328.03	8082.01	48.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	65,408.94	16352.24	98.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	66,248.85	11262.30	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:51 PM	66,248.86	3312.44	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

DECEMBER 13

Analysis Hours: 8:15 AM-3:52 PM (PST)

DECEMBER 28 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:15 AM	55,518.80	6662.26	83.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	45,003.93	11250.98	67.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	34,971.38	8742.84	52.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	27,900.86	6975.22	42.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	23,518.31	5879.58	35.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	20,385.07	5096.27	30.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	18,659.87	4664.97	28.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	17,256.71	4314.18	26.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	16,267.34	4066.84	24.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	15,226.41	3806.60	23.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	14,581.26	3645.32	22.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	13,857.98	3464.49	20.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	13,462.92	3365.73	20.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	13,018.70	3254.68	19.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	13,044.13	3261.03	19.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	12,841.84	3210.46	19.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	12,958.19	3239.55	19.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	12,938.26	3234.57	19.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	13,202.04	3300.51	19.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	13,359.11	3339.78	20.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	13,818.82	3454.70	20.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	14,186.58	3546.64	21.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	14,890.13	3722.53	22.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	15,615.84	3903.96	23.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	16,837.05	4209.26	25.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	18,058.42	4514.61	27.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	19,911.01	4977.75	30.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	21,965.34	5491.33	33.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	34,305.48	8576.37	51.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	66,248.86	16562.22	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	66,248.86	11924.80	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:52 PM	66,248.87	3974.93	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN PLAYGROUND

Quantitative Shading Calculations for CPHP

DECEMBER 20

Analysis Hours: 8:19 AM-3:54 PM (PST)

WINTER SOLSTICE
DECEMBER 21 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:19 AM	55,894.48	4471.56	84.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	48,337.54	10150.88	73.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	38,028.00	9507.00	57.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	29,733.38	7433.34	44.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	24,984.88	6246.22	37.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	21,310.09	5327.52	32.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	19,333.07	4833.27	29.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	17,804.09	4451.02	26.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	16,784.87	4196.22	25.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	15,652.47	3913.12	23.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	14,970.68	3742.67	22.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	14,212.18	3553.05	21.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	13,784.73	3446.18	20.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	13,266.06	3316.51	20.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	13,294.07	3323.52	20.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	13,057.20	3264.30	19.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	13,155.90	3288.97	19.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	13,121.34	3280.34	19.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	13,365.07	3341.27	20.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	13,504.16	3376.04	20.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	13,946.66	3486.66	21.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	14,296.93	3574.23	21.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	14,977.35	3744.34	22.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	15,666.18	3916.54	23.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	16,850.00	4212.50	25.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	18,052.82	4513.21	27.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	19,831.06	4957.76	29.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	21,833.16	5458.29	33.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	28,688.62	7172.16	43.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	66,248.86	16562.21	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	66,248.87	13912.26	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:54 PM	66,248.86	5299.91	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

THEORETICAL ANNUAL AVAILABLE SUNLIGHT (TAAS)	GRATTAN PLAYGROUND
Area of Grattan Playground	1.52 acres (66,249 sf)
Hours of annual available sunlight	3721.4 hrs
TAAS for Grattan Playground	246,538,524 sfh

EXISTING (CURRENT) LEVELS OF SHADOW (ROUGH APPROXIMATE)	GRATTAN PLAYGROUND
Existing annual total shading on park (sfh)	34,143,738 sfh
Existing shading as percentage of TAAS	13.85%

NEW SHADOW CAST BY THE PROPOSED CPHP PROJECT	GRATTAN PLAYGROUND
Additional annual shading on Grattan Playground from Project	716,661 sfh
Additional annual shading from Project as percentage of TAAS	0.29%
Combined total annual shading existing + Project (sfh)	34,860,399 sfh
Combined total annual shading from existing + Project as percentage of TAAS	14.14%
Number of days when new shading from Project would occur	141-153 days annually
Dates when new shadow from Project would be cast on Grattan Playground	Between Apr 6 - Sep 5
Annual range in duration of new Project shadow (duration variance +/- 7 min.)	Zero to approx. 37 min
Range in area of new Project shadow (sf)	Zero to 30,117 sf
Average daily duration of new Project shadow (when present)	Approx. 24 min.
MAXIMUM NEW SHADING BY THE PROPOSED PROJECT	GRATTAN PLAYGROUND
Dates of maximum new shading from proposed Project (max sfh)	May 10 & Aug 2
Total new shading on date(s) of maximum shading (sfh)	8,983.32 sfh
Percentage new shadow on date(s) of maximum shading	1.12%
Date and duration of longest duration of new shading (duration variance +/- 7 min.)	Approx. 37 min on Jul 19 & May 24
Date and time of largest area of new Project shadow	30,117 sf on Aug 2/May 10 at 7:15 PM
Percentage of Grattan Playground covered by largest new shadow	45.46%

GAMBLE PARK

Quantitative Shading Calculations for CPHP

JUNE 21

Analysis Hours: 6:46 AM-7:36 PM (PDT)

SUMMER SOLSTICE

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:46 AM	23,887.24	2627.60	91.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	18,012.82	4142.95	68.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	9,300.23	2325.06	35.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	4,259.11	1064.78	16.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	1,828.68	457.17	7.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	810.06	202.51	3.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	524.08	131.02	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	347.60	86.90	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	324.50	81.13	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	364.10	91.03	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	395.47	98.87	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	410.04	102.51	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	417.60	104.40	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	414.69	103.67	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	404.31	101.08	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	393.89	98.47	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	386.17	96.54	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	371.87	92.97	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	362.21	90.55	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	344.63	86.16	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	333.55	83.39	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	313.26	78.32	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	301.05	75.26	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	278.62	69.66	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	265.59	66.40	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	239.84	59.96	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	232.12	58.03	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	235.09	58.77	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	280.92	70.23	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	327.72	81.93	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	385.51	96.38	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	434.56	108.64	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	492.71	123.18	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	543.29	135.82	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	597.35	149.34	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	647.22	161.80	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	714.77	178.69	2.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	788.04	197.01	3.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	934.42	233.61	3.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	1,117.65	279.41	4.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	1,313.65	328.41	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	1,531.93	382.98	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	1,771.30	442.83	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	2,053.14	513.29	7.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	2,400.59	600.15	9.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	2,809.81	702.45	10.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	3,365.05	841.26	12.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	4,146.50	1036.62	15.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	5,785.52	1446.38	22.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	9,091.41	2272.85	34.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	13,894.47	4168.34	52.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:36 PM	22,486.73	4047.61	85.7%	0.00	0.00	0.0%	0.00	0.00	0.0%

JUNE 28

Analysis Hours: 6:48 AM-7:36 PM (PDT)

JUNE 14 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:48 AM	23,742.24	2374.22	90.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	18,647.93	4102.54	71.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	10,129.55	2532.39	38.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	4,666.90	1166.73	17.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	2,032.14	508.04	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	878.98	219.75	3.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	561.48	140.37	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	378.15	94.54	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	332.22	83.05	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	369.16	92.29	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	400.94	100.24	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	416.47	104.12	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	423.88	105.97	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	421.48	105.37	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	410.60	102.65	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	399.36	99.84	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	392.05	98.01	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	377.13	94.28	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	367.22	91.80	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	349.69	87.42	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	338.86	84.72	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	318.17	79.54	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	305.90	76.48	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	283.27	70.82	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	269.93	67.48	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	244.39	61.10	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	235.80	58.95	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	234.12	58.53	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	279.90	69.97	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	326.14	81.53	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	383.36	95.84	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	433.69	108.42	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	490.87	122.72	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	542.17	135.54	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	596.79	149.20	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	646.09	161.52	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	713.33	178.33	2.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	782.62	195.65	3.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	916.39	229.10	3.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	1,097.31	274.33	4.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	1,292.65	323.16	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	1,508.12	377.03	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	1,745.35	436.34	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	2,021.72	505.43	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	2,363.34	590.84	9.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	2,771.18	692.79	10.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	3,306.30	826.57	12.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	4,064.54	1016.14	15.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	5,573.12	1393.28	21.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	8,734.05	2183.51	33.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	13,460.07	4038.02	51.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:36 PM	22,369.42	4026.50	85.2%	0.00	0.00	0.0%	0.00	0.00	0.0%

JULY 5

Analysis Hours: 6:52 AM-7:36 PM (PDT)

JUNE 7 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:52 AM	23,314.57	1398.87	88.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	19,660.27	3735.45	74.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	11,353.89	2838.47	43.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	5,158.53	1289.63	19.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	2,352.36	588.09	9.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	1,030.23	257.56	3.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	631.89	157.97	2.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	458.22	114.55	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	370.95	92.74	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	397.01	99.25	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	424.19	106.05	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	438.09	109.52	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	444.17	111.04	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	440.54	110.13	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	428.53	107.13	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	415.91	103.98	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	406.82	101.70	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	391.18	97.80	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	380.86	95.22	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	362.01	90.50	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	350.97	87.74	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	329.92	82.48	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	316.74	79.18	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	293.95	73.49	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	280.26	70.06	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	254.50	63.63	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	245.00	61.25	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	240.30	60.07	0.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	285.98	71.49	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	331.71	82.93	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	389.60	97.40	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	439.88	109.97	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	497.66	124.42	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	549.22	137.30	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	604.96	151.24	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	655.39	163.85	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	722.84	180.71	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	790.54	197.63	3.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	899.52	224.88	3.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	1,076.21	269.05	4.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	1,270.06	317.52	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	1,485.28	371.32	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	1,721.54	430.38	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	1,994.23	498.56	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	2,334.98	583.75	8.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	2,741.60	685.40	10.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	3,267.51	816.88	12.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	4,019.78	1004.95	15.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	5,466.48	1366.62	20.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	8,514.49	2128.62	32.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	13,257.99	3977.40	50.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:36 PM	21,990.65	3958.32	83.8%	0.00	0.00	0.0%	0.00	0.00	0.0%

JULY 12

Analysis Hours: 6:56 AM-7:33 PM (PDT)

MAY 31 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:56 AM	22,613.14	678.39	86.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	20,956.50	3143.47	79.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	12,799.66	3199.92	48.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	5,834.06	1458.51	22.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	2,848.59	712.15	10.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	1,333.52	333.38	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	760.04	190.01	2.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	604.61	151.15	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	445.60	111.40	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	452.96	113.24	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	468.90	117.22	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	476.82	119.20	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	479.83	119.96	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	473.60	118.40	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	458.53	114.63	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	442.63	110.66	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	431.80	107.95	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	414.53	103.63	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	402.12	100.53	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	382.85	95.71	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	369.82	92.46	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	347.85	86.96	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	333.85	83.46	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	310.25	77.56	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	295.69	73.92	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	269.37	67.34	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	259.00	64.75	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	253.07	63.27	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	299.11	74.78	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	344.84	86.21	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	403.24	100.81	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	454.39	113.60	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	512.84	128.21	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	565.31	141.33	2.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	622.49	155.62	2.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	675.37	168.84	2.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	744.81	186.20	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	812.00	203.00	3.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	893.85	223.46	3.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	1,054.04	263.51	4.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	1,248.30	312.07	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	1,463.46	365.86	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	1,700.39	425.10	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	1,971.60	492.90	7.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	2,313.73	578.43	8.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	2,726.47	681.62	10.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	3,246.31	811.58	12.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	4,012.07	1003.02	15.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	5,458.97	1364.74	20.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	8,445.31	2111.33	32.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	13,386.44	3748.20	51.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:33 PM	21,324.74	3198.71	81.3%	0.00	0.00	0.0%	0.00	0.00	0.0%

GAMBLE PARK

Quantitative Shading Calculations for CPHP

JULY 19

Analysis Hours: 7:01 AM-7:30 PM (PDT)

MAY 24 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:01 AM	21,405.87	2782.76	81.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:16 AM	13,900.50	3336.12	53.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	7,113.17	1707.16	27.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	3,671.27	917.82	14.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	1,842.99	460.75	7.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	1,054.19	263.55	4.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	839.85	209.96	3.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	596.53	149.13	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	543.29	135.82	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	543.19	135.80	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	534.55	133.64	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	530.21	132.55	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	519.58	129.90	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	501.29	125.32	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	479.88	119.97	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	466.55	116.64	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	446.42	111.60	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	432.06	108.01	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	410.34	102.59	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	395.63	98.91	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	372.53	93.13	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	357.15	89.29	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	332.12	83.03	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	316.28	79.07	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	289.25	72.31	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	277.65	69.41	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	273.36	68.34	1.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	319.60	79.90	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	366.45	91.61	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	425.52	106.38	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	477.63	119.41	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	537.16	134.29	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	592.14	148.03	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	650.34	162.58	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	706.28	176.57	2.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	778.48	194.62	3.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	847.87	211.97	3.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	923.18	230.80	3.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	1,040.34	260.09	4.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	1,230.01	307.50	4.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	1,447.87	361.97	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	1,685.77	421.44	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	1,958.52	489.63	7.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	2,305.60	576.40	8.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	2,728.67	682.17	10.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	3,248.97	812.24	12.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	4,083.75	1020.94	15.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	5,574.55	1393.64	21.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	8,598.60	2149.65	32.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	13,906.84	3476.71	53.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 PM	20,366.76	2647.68	77.6%	0.00	0.00	0.0%	0.00	0.00	0.0%

GAMBLE PARK

Quantitative Shading Calculations for CPHP

JULY 26

Analysis Hours: 7:07 AM-7:25 PM (PDT)

MAY 17 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:07 AM	19,859.95	1191.60	75.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	16,289.60	3095.02	62.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	9,299.36	2324.84	35.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	5,053.13	1263.28	19.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	2,721.16	680.29	10.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	1,574.69	393.67	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	1,196.90	299.22	4.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	841.99	210.50	3.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	680.33	170.08	2.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	649.47	162.37	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	619.93	154.98	2.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	598.73	149.68	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	579.67	144.92	2.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	558.16	139.54	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	529.09	132.27	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	510.80	127.70	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	487.24	121.81	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	469.92	117.48	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	445.29	111.32	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	428.43	107.11	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	403.44	100.86	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	385.77	96.44	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	359.81	89.95	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	342.13	85.53	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	314.18	78.55	1.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	301.36	75.34	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	300.69	75.17	1.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	347.24	86.81	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	396.44	99.11	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	455.71	113.93	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	508.65	127.16	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	570.42	142.61	2.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	626.07	156.52	2.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	687.53	171.88	2.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	749.25	187.31	2.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	824.36	206.09	3.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	896.36	224.09	3.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	973.61	243.40	3.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	1,055.06	263.76	4.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	1,215.34	303.84	4.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	1,435.61	358.90	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	1,675.96	418.99	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	1,956.37	489.09	7.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	2,313.93	578.48	8.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	2,746.19	686.55	10.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	3,267.97	816.99	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	4,232.34	1058.08	16.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	5,815.51	1453.88	22.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	9,024.01	2256.00	34.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	14,747.30	3096.93	56.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:25 PM	19,013.15	1711.18	72.4%	0.00	0.00	0.0%	0.00	0.00	0.0%

AUGUST 2

Analysis Hours: 7:12 AM-7:18 PM (PDT)

MAY 10 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:12 AM	18,679.61	373.59	71.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	17,435.70	2615.36	66.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	11,765.35	2941.34	44.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	6,985.07	1746.27	26.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	4,132.19	1033.05	15.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	2,380.41	595.10	9.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	1,705.44	426.36	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	1,191.58	297.90	4.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	875.71	218.93	3.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	800.71	200.18	3.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	738.93	184.73	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	692.74	173.19	2.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	653.81	163.45	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	628.21	157.05	2.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	588.92	147.23	2.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	564.65	141.16	2.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	536.09	134.02	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	514.73	128.68	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	487.39	121.85	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	467.62	116.90	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	439.98	109.99	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	420.10	105.03	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	392.31	98.08	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	372.74	93.18	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	342.74	85.69	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	329.71	82.43	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	335.18	83.80	1.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	382.85	95.71	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	434.31	108.58	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	494.65	123.66	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	549.68	137.42	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	612.42	153.11	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	670.52	167.63	2.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	734.85	183.71	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	804.13	201.03	3.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	882.61	220.65	3.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	958.08	239.52	3.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	1,038.81	259.70	4.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	1,119.49	279.87	4.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	1,226.22	306.56	4.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	1,433.31	358.33	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	1,678.98	419.74	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	1,980.33	495.08	7.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	2,350.06	587.51	9.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	2,797.95	699.49	10.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	3,337.26	834.31	12.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	4,474.83	1118.71	17.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	6,218.34	1554.59	23.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	9,843.27	2460.82	37.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	16,197.52	2429.63	61.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:18 PM	17,561.24	526.84	66.9%	0.00	0.00	0.0%	0.00	0.00	0.0%

AUGUST 9

Analysis Hours: 7:19 AM-7:10 PM (PDT)

MAY 3 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:19 AM	19,922.13	1792.99	75.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	15,230.71	3198.45	58.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	9,865.29	2466.32	37.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	6,128.52	1532.13	23.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	3,667.49	916.87	14.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	2,418.52	604.63	9.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	1,673.41	418.35	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	1,142.38	285.59	4.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	1,002.63	250.66	3.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	898.04	224.51	3.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	818.03	204.51	3.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	747.42	186.85	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	708.38	177.09	2.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	659.58	164.90	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	628.52	157.13	2.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	594.18	148.55	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	568.17	142.04	2.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	536.04	134.01	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	512.58	128.15	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	482.13	120.53	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	459.44	114.86	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	429.40	107.35	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	407.28	101.82	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	375.14	93.78	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	362.42	90.60	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	377.18	94.30	1.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	427.51	106.88	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	480.50	120.12	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	542.37	135.59	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	598.58	149.64	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	663.67	165.92	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	724.22	181.05	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	795.09	198.77	3.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	871.01	217.75	3.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	953.53	238.38	3.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	1,032.17	258.04	3.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	1,118.52	279.63	4.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	1,203.18	300.80	4.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	1,297.91	324.48	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	1,441.59	360.40	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	1,692.98	423.24	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	2,034.29	508.57	7.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	2,416.38	604.09	9.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	2,885.17	721.29	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	3,581.75	895.44	13.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	4,821.67	1205.42	18.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	6,834.50	2323.73	26.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:10 PM	16,000.65	3360.14	61.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

GAMBLE PARK

Quantitative Shading Calculations for CPHP

AUGUST 16

Analysis Hours: 7:25 AM-7:02 PM (PDT)

APRIL 26 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:25 AM	21,292.44	851.70	81.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	19,517.66	3318.00	74.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	13,718.15	3429.54	52.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	8,996.11	2249.03	34.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	5,469.50	1367.37	20.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	3,456.21	864.05	13.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	2,337.90	584.47	8.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	1,523.55	380.89	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	1,269.04	317.26	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	1,107.12	276.78	4.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	983.58	245.89	3.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	871.52	217.88	3.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	802.70	200.67	3.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	740.98	185.24	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	700.51	175.13	2.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	659.99	165.00	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	628.01	157.00	2.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	591.63	147.91	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	564.14	141.03	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	529.65	132.41	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	503.90	125.97	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	470.84	117.71	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	445.90	111.48	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	412.64	103.16	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	399.61	99.90	1.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	424.96	106.24	1.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	479.12	119.78	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	533.43	133.36	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	597.81	149.45	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	656.88	164.22	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	723.61	180.90	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	787.27	196.82	3.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	867.13	216.78	3.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	947.86	236.97	3.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	1,035.03	258.76	3.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	1,118.93	279.73	4.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	1,211.20	302.80	4.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	1,303.89	325.97	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	1,404.75	351.19	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	1,513.84	378.46	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	1,751.12	437.78	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	2,116.04	529.01	8.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	2,516.32	629.08	9.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	3,019.30	754.82	11.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	3,961.28	990.32	15.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	5,292.20	1323.05	20.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	7,777.60	2099.95	29.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:02 PM	14,039.02	1965.46	53.5%	0.00	0.00	0.0%	0.00	0.00	0.0%

AUGUST 23

Analysis Hours: 7:31 AM-6:52 PM (PDT)

APRIL 19 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:31 AM	22,290.28	2451.93	84.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	18,383.77	4228.27	70.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	12,652.41	3163.10	48.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	7,909.22	1977.31	30.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	4,893.76	1223.44	18.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	3,233.43	808.36	12.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	2,060.86	515.21	7.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	1,602.59	400.65	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	1,369.75	342.44	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	1,190.10	297.53	4.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	1,028.39	257.10	3.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	921.50	230.37	3.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	833.31	208.33	3.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	782.72	195.68	3.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	732.85	183.21	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	694.84	173.71	2.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	652.63	163.16	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	620.09	155.02	2.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	581.10	145.28	2.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	551.67	137.92	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	515.96	128.99	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	487.04	121.76	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	454.74	113.69	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	443.76	110.94	1.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	480.80	120.20	1.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	539.05	134.76	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	595.87	148.97	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	662.19	165.55	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	722.84	180.71	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	793.91	198.48	3.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	861.51	215.38	3.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	951.08	237.77	3.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	1,037.89	259.47	4.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	1,130.17	282.54	4.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	1,219.94	304.99	4.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	1,320.49	330.12	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	1,420.44	355.11	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	1,532.23	383.06	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	1,658.39	414.60	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	1,891.63	472.91	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	2,241.12	560.28	8.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	2,671.14	667.78	10.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	3,380.28	845.07	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	4,481.07	1120.27	17.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	6,100.06	1525.01	23.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	9,222.77	1752.33	35.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:52 PM	11,960.13	717.61	45.6%	0.00	0.00	0.0%	0.00	0.00	0.0%

AUGUST 30

Analysis Hours: 7:37 AM-6:42 PM (PDT)

APRIL 12 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:37 AM	22,971.52	1378.29	87.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	21,494.98	4084.05	81.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	17,755.46	4438.86	67.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	11,299.42	2824.85	43.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	6,889.78	1722.45	26.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	4,398.24	1099.56	16.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	2,780.17	695.04	10.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	2,022.64	505.66	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	1,697.52	424.38	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	1,453.24	363.31	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	1,229.29	307.32	4.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	1,074.58	268.64	4.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	948.06	237.02	3.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	872.80	218.20	3.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	813.33	203.33	3.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	768.11	192.03	2.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	719.57	179.89	2.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	681.76	170.44	2.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	638.33	159.58	2.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	604.04	151.01	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	564.90	141.23	2.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	532.66	133.17	2.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	500.17	125.04	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	502.47	125.62	1.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	543.65	135.91	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	606.34	151.59	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	665.20	166.30	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	733.93	183.48	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	799.17	199.79	3.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	872.19	218.05	3.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	950.16	237.54	3.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	1,044.99	261.25	4.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	1,139.16	284.79	4.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	1,238.74	309.69	4.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	1,335.72	333.93	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	1,443.63	360.91	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	1,553.79	388.45	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	1,677.39	419.35	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	1,882.44	470.61	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	2,140.41	535.10	8.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	2,429.71	607.43	9.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	2,966.26	741.56	11.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	3,874.37	968.59	14.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	5,196.55	1299.14	19.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	7,241.11	1665.46	27.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:42 PM	10,437.30	1148.10	39.8%	0.00	0.00	0.0%	0.00	0.00	0.0%

SEPTEMBER 6

Analysis Hours: 7:44 AM-6:31 PM (PDT)

APRIL 5 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:44 AM	24,411.53	3173.50	93.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	21,570.04	5392.51	82.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	15,179.25	3794.81	57.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	9,292.11	2323.03	35.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	5,890.88	1472.72	22.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	3,824.60	956.15	14.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	2,661.79	665.45	10.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	2,176.74	544.19	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	1,812.44	453.11	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	1,490.18	372.55	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	1,271.09	317.77	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	1,098.85	274.71	4.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	987.46	246.86	3.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	902.44	225.61	3.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	847.51	211.88	3.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	791.82	197.95	3.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	747.82	186.96	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	699.13	174.78	2.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	660.71	165.18	2.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	617.33	154.33	2.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	580.34	145.08	2.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	549.68	137.42	2.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	569.40	142.35	2.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	615.28	153.82	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	680.69	170.17	2.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	741.69	185.42	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	814.09	203.52	3.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	882.46	220.61	3.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	961.30	240.32	3.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	1,048.98	262.24	4.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	1,149.74	287.43	4.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	1,251.47	312.87	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	1,360.35	340.09	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	1,466.01	366.50	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	1,583.43	395.86	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	1,704.47	426.12	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	1,888.06	472.01	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	2,157.12	539.28	8.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	2,459.30	614.82	9.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	2,785.03	696.26	10.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	3,469.75	867.44	13.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	4,546.21	1136.55	17.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	6,186.10	1670.25	23.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:31 PM	9,527.14	1333.80	36.3%	0.00	0.00	0.0%	0.00	0.00	0.0%

SEPTEMBER 13

Analysis Hours: 7:50 AM-6:21 PM (PDT)

MARCH 29 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:50 AM	25,174.32	2013.95	95.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	23,931.34	5025.58	91.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	19,779.42	4944.86	75.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	12,557.48	3139.37	47.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	7,983.21	1995.80	30.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	5,263.02	1315.76	20.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	3,519.26	879.81	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	2,853.03	713.26	10.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	2,374.73	593.68	9.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	1,916.11	479.03	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	1,592.37	398.09	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	1,331.38	332.84	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	1,153.16	288.29	4.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	1,019.09	254.77	3.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	935.60	233.90	3.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	869.84	217.46	3.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	818.79	204.70	3.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	764.38	191.09	2.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	720.44	180.11	2.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	672.82	168.20	2.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	630.82	157.70	2.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	602.00	150.50	2.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	642.31	160.58	2.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	694.38	173.59	2.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	762.39	190.60	2.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	827.07	206.77	3.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	903.36	225.84	3.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	974.63	243.66	3.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	1,063.39	265.85	4.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	1,156.38	289.09	4.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	1,264.75	316.19	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	1,375.32	343.83	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	1,494.32	373.58	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	1,610.97	402.74	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	1,741.06	435.26	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	1,886.98	471.75	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	2,178.53	544.63	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	2,491.95	622.99	9.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	2,877.15	719.29	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	3,465.97	866.49	13.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	4,251.96	1062.99	16.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	5,522.48	1380.62	21.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	7,429.50	1337.31	28.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:21 PM	8,710.85	435.54	33.2%	0.00	0.00	0.0%	0.00	0.00	0.0%

SEPTEMBER 20

Analysis Hours: 7:57 AM-6:09 PM (PDT)

APPROXIMATE EQUINOXES
MARCH 22 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:57 AM	25,351.62	507.03	96.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	25,018.79	3752.82	95.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	22,489.95	5622.49	85.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	16,575.47	4143.87	63.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	11,153.64	2788.41	42.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	7,303.85	1825.96	27.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	4,728.83	1182.21	18.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	3,654.15	913.54	13.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	3,028.85	757.21	11.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	2,442.49	610.62	9.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	2,011.81	502.95	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	1,664.47	416.12	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	1,414.61	353.65	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	1,220.30	305.07	4.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	1,086.89	271.72	4.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	974.74	243.68	3.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	904.38	226.09	3.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	834.12	208.53	3.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	784.87	196.22	3.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	730.91	182.73	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	689.37	172.34	2.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	671.85	167.96	2.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	722.38	180.59	2.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	779.60	194.90	3.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	852.42	213.10	3.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	920.47	230.12	3.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	1,000.79	250.20	3.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	1,077.59	269.40	4.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	1,174.41	293.60	4.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	1,273.23	318.31	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	1,389.68	347.42	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	1,511.54	377.88	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	1,644.49	411.12	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	1,772.63	443.16	6.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	1,916.77	479.19	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	2,181.29	545.32	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	2,527.81	631.95	9.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	2,938.92	734.73	11.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	3,551.55	887.89	13.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	4,357.47	1089.37	16.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	5,478.95	1369.74	20.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	6,750.50	1417.60	25.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:09 PM	8,222.39	657.79	31.3%	0.00	0.00	0.0%	0.00	0.00	0.0%

SEPTEMBER 27

Analysis Hours: 8:03 AM-5:58 PM (PDT)

MARCH 15 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:03 AM	25,762.12	2576.21	98.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	24,060.46	5293.30	91.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	20,515.09	5128.77	78.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	14,650.73	3662.68	55.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	9,993.23	2498.31	38.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	6,457.37	1614.34	24.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	4,725.25	1181.31	18.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	3,904.77	976.19	14.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	3,143.35	785.84	12.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	2,530.78	632.69	9.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	2,048.24	512.06	7.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	1,728.38	432.10	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	1,473.27	368.32	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	1,303.17	325.79	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	1,153.36	288.34	4.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	1,056.54	264.13	4.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	962.52	240.63	3.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	889.20	222.30	3.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	803.93	200.98	3.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	753.85	188.46	2.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	756.87	189.22	2.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	812.56	203.14	3.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	873.11	218.28	3.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	948.42	237.11	3.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	1,021.59	255.40	3.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	1,106.25	276.56	4.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	1,191.48	297.87	4.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	1,295.05	323.76	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	1,401.89	350.47	5.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	1,524.98	381.24	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	1,659.51	414.88	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	1,808.09	452.02	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	1,951.72	487.93	7.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	2,184.25	546.06	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	2,540.23	635.06	9.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	2,978.27	744.57	11.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	3,584.92	896.23	13.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	4,433.81	1108.45	16.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	5,522.13	1380.53	21.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	7,029.07	1616.69	26.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:58 PM	8,438.52	928.24	32.2%	0.00	0.00	0.0%	0.00	0.00	0.0%

OCTOBER 4

Analysis Hours: 8:09 AM-5:47 PM (PDT)

MARCH 8 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:09 AM	25,765.80	1030.63	98.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	24,397.89	4147.64	93.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	22,584.43	5646.11	86.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	17,794.34	4448.58	67.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	12,959.59	3239.90	49.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	8,654.34	2163.59	33.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	6,166.33	1541.58	23.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	4,953.90	1238.47	18.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	4,012.48	1003.12	15.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	3,281.11	820.28	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	2,581.72	645.43	9.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	2,103.78	525.94	8.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	1,766.20	441.55	6.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	1,554.66	388.67	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	1,370.77	342.69	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	1,247.28	311.82	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	1,131.34	282.84	4.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	1,048.57	262.14	4.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	947.14	236.79	3.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	889.77	222.44	3.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	877.66	219.41	3.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	919.25	229.81	3.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	974.33	243.58	3.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	1,052.40	263.10	4.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	1,128.68	282.17	4.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	1,220.71	305.18	4.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	1,312.22	328.05	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	1,423.20	355.80	5.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	1,538.47	384.62	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	1,675.71	418.93	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	1,821.38	455.34	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	1,987.59	496.90	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	2,168.77	542.19	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	2,539.00	634.75	9.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	2,967.64	741.91	11.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	3,607.65	901.91	13.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	4,434.98	1108.75	16.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	5,502.10	1375.52	21.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	7,121.04	1922.68	27.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:47 PM	8,803.54	1232.50	33.5%	0.00	0.00	0.0%	0.00	0.00	0.0%

GAMBLE PARK

Quantitative Shading Calculations for CPHP

OCTOBER 11

Analysis Hours: 8:16 AM-5:37 PM (PDT)

MARCH 1 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:16 AM	25,508.43	3061.01	97.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	23,033.14	5527.95	87.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	19,869.81	4967.45	75.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	15,636.30	3909.07	59.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	11,321.29	2830.32	43.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	8,119.43	2029.86	30.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	6,397.07	1599.27	24.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	5,032.38	1258.10	19.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	4,125.29	1031.32	15.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	3,290.46	822.61	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	2,677.06	669.27	10.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	2,199.22	549.81	8.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	1,893.78	473.44	7.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	1,641.12	410.28	6.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	1,475.41	368.85	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	1,328.47	332.12	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	1,229.09	307.27	4.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	1,121.84	280.46	4.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	1,064.20	266.05	4.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	1,056.79	264.20	4.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	1,093.28	273.32	4.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	1,128.63	282.16	4.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	1,190.71	297.68	4.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	1,251.77	312.94	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	1,345.94	336.49	5.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	1,436.89	359.22	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	1,559.62	389.90	5.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	1,684.19	421.05	6.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	1,834.10	458.53	7.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	1,993.57	498.39	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	2,185.99	546.50	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	2,511.77	627.94	9.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	2,961.00	740.25	11.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	3,583.03	895.76	13.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	4,421.95	1105.49	16.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	5,421.83	1355.46	20.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	6,859.63	1714.91	26.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	8,869.09	1685.13	33.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:37 PM	9,432.36	565.94	35.9%	0.00	0.00	0.0%	0.00	0.00	0.0%

OCTOBER 18

Analysis Hours: 8:22 AM-5:27 PM (PDT)

FEBRUARY 22 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:22 AM	25,165.02	1509.90	95.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	23,892.15	4300.59	91.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	21,181.21	5295.30	80.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	17,658.58	4414.64	67.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	13,690.15	3422.54	52.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	10,241.86	2560.46	39.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	8,219.12	2054.78	31.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	6,416.80	1604.20	24.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,149.24	1287.31	19.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	4,089.83	1022.46	15.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	3,391.27	847.82	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	2,764.69	691.17	10.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	2,364.31	591.08	9.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	2,025.50	506.38	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	1,792.05	448.01	6.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	1,593.19	398.30	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	1,457.79	364.45	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	1,322.39	330.60	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	1,264.24	316.06	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	1,251.93	312.98	4.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	1,287.44	321.86	4.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	1,316.66	329.17	5.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	1,377.67	344.42	5.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	1,433.16	358.29	5.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	1,524.41	381.10	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	1,609.23	402.31	6.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	1,730.63	432.66	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	1,853.21	463.30	7.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	2,013.70	503.42	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	2,187.32	546.83	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	2,470.84	617.71	9.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	2,917.77	729.44	11.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	3,526.97	881.74	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	4,348.53	1087.13	16.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	5,365.32	1341.33	20.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	6,641.51	1660.38	25.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	8,357.68	1838.69	31.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:27 PM	10,438.37	1043.84	39.8%	0.00	0.00	0.0%	0.00	0.00	0.0%

OCTOBER 25

Analysis Hours: 7:30 AM-4:18 PM (PST)

FEBRUARY 15 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:30 AM	25,184.29	3273.96	96.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	22,124.37	5531.09	84.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	19,151.52	4787.88	73.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	15,603.70	3900.92	59.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	12,179.68	3044.92	46.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	10,076.11	2519.03	38.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	8,034.36	2008.59	30.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	6,400.24	1600.06	24.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	5,058.85	1264.71	19.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	4,140.88	1035.22	15.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	3,440.37	860.09	13.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	2,964.52	741.13	11.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	2,528.73	632.18	9.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	2,232.13	558.03	8.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	1,928.22	482.05	7.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	1,741.31	435.33	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	1,572.65	393.16	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	1,499.12	374.78	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	1,463.61	365.90	5.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	1,492.79	373.20	5.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	1,517.47	379.37	5.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	1,577.45	394.36	6.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	1,632.79	408.20	6.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	1,729.15	432.29	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	1,816.63	454.16	6.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	1,943.70	485.92	7.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	2,074.50	518.63	7.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	2,257.32	564.33	8.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	2,451.53	612.88	9.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	2,895.54	723.89	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	3,429.38	857.35	13.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	4,297.43	1074.36	16.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	5,260.57	1315.14	20.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	6,446.74	1611.68	24.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	8,283.03	2070.76	31.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	10,457.58	1568.64	39.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:18 PM	11,336.00	340.08	43.2%	820.63	24.62	3.1%	0.00	0.00	0.0%

GAMBLE PARK

Quantitative Shading Calculations for CPHP

NOVEMBER 1

Analysis Hours: 7:36 AM-4:10 PM (PST)

FEBRUARY 8 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:36 AM	25,310.75	1771.75	96.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	23,476.19	4460.48	89.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	20,129.22	5032.30	76.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	17,099.40	4274.85	65.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	13,845.83	3461.46	52.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	11,672.87	2918.22	44.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	9,727.74	2431.94	37.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	7,859.15	1964.79	29.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	6,192.85	1548.21	23.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	5,055.17	1263.79	19.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	4,192.69	1048.17	16.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	3,598.97	899.74	13.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	3,113.16	778.29	11.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	2,762.80	690.70	10.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	2,341.42	585.36	8.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	2,094.22	523.56	8.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	1,871.60	467.90	7.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	1,777.03	444.26	6.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	1,702.02	425.51	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	1,708.25	427.06	6.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	1,726.29	431.57	6.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	1,782.60	445.65	6.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	1,835.68	458.92	7.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	1,937.21	484.30	7.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	2,030.87	507.72	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	2,165.91	541.48	8.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	2,318.94	579.73	8.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	2,528.22	632.06	9.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	2,832.70	708.17	10.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	3,400.72	850.18	13.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	4,187.38	1046.84	16.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,242.53	1310.63	20.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	6,369.38	1592.34	24.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	7,941.57	1985.39	30.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	10,075.80	2115.92	38.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:10 PM	11,907.91	1071.71	45.4%	358.84	32.30	1.4%	0.00	0.00	0.0%

GAMBLE PARK

Quantitative Shading Calculations for CPHP

NOVEMBER 8

Analysis Hours: 7:43 AM-4:03 PM (PST)

FEBRUARY 1 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:43 AM	25,422.44	254.22	96.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	25,320.25	3291.63	96.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	21,220.14	5305.04	80.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	18,160.84	4540.21	69.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	15,345.52	3836.38	58.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	13,185.53	3296.38	50.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	11,293.70	2823.42	43.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	9,440.64	2360.16	36.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	7,599.79	1899.95	29.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	6,152.48	1538.12	23.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	5,047.61	1261.90	19.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	4,310.67	1077.67	16.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	3,714.19	928.55	14.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	3,276.46	819.11	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	2,834.23	708.56	10.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	2,498.18	624.54	9.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	2,233.82	558.45	8.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	2,119.72	529.93	8.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	2,003.28	500.82	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	1,981.56	495.39	7.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	1,968.89	492.22	7.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	2,009.76	502.44	7.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	2,048.09	512.02	7.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	2,154.06	538.51	8.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	2,255.63	563.91	8.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	2,402.38	600.59	9.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	2,589.23	647.31	9.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	2,830.09	707.52	10.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	3,296.38	824.10	12.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,013.19	1003.30	15.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	5,081.38	1270.35	19.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	6,375.26	1593.81	24.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	7,821.34	1955.34	29.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	10,024.19	2506.05	38.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	12,212.43	1831.86	46.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:03 PM	12,784.08	383.52	48.7%	81.29	2.44	0.3%	0.00	0.00	0.0%

GAMBLE PARK

Quantitative Shading Calculations for CPHP

NOVEMBER 15

Analysis Hours: 7:51 AM-3:57 PM (PST)

JANUARY 25 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:51 AM	25,553.96	2044.32	97.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	23,016.28	4603.26	87.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	19,238.53	4809.63	73.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	16,563.97	4140.99	63.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	14,498.11	3624.53	55.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	12,715.26	3178.81	48.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	10,991.27	2747.82	41.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	9,010.06	2252.52	34.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	7,454.99	1863.75	28.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	6,056.48	1514.12	23.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,096.15	1274.04	19.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	4,329.47	1082.37	16.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	3,835.54	958.88	14.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	3,330.57	832.64	12.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	2,923.29	730.82	11.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	2,643.49	660.87	10.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	2,525.77	631.44	9.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	2,377.39	594.35	9.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	2,311.63	577.91	8.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	2,267.69	566.92	8.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	2,289.76	572.44	8.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	2,285.01	571.25	8.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	2,388.68	597.17	9.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	2,503.95	625.99	9.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	2,676.96	669.24	10.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	2,884.56	721.14	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	3,218.11	804.53	12.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	3,811.93	952.98	14.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,715.90	1178.97	18.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	5,951.42	1487.86	22.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	7,567.45	1891.86	28.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	9,372.63	2343.16	35.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	11,620.60	2672.74	44.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:57 PM	13,768.83	1514.57	52.5%	0.00	0.00	0.0%	0.00	0.00	0.0%

GAMBLE PARK

Quantitative Shading Calculations for CPHP

NOVEMBER 22

Analysis Hours: 7:57 AM-3:54 PM (PST)

JANUARY 18 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:57 AM	25,760.53	515.21	98.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	25,623.45	3843.52	97.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	20,756.15	5189.04	79.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	17,464.42	4366.10	66.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	15,537.63	3884.41	59.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	13,939.03	3484.76	53.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	12,362.96	3090.74	47.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	10,402.09	2600.52	39.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	8,708.96	2177.24	33.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	7,182.76	1795.69	27.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	6,024.69	1506.17	23.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	4,996.36	1249.09	19.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,383.37	1095.84	16.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	3,833.24	958.31	14.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	3,402.30	850.58	13.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,036.21	759.05	11.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	2,910.67	727.67	11.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	2,763.57	690.89	10.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	2,702.46	675.61	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	2,619.63	654.91	10.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	2,633.94	658.48	10.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	2,595.31	648.83	9.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	2,657.03	664.26	10.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	2,761.22	690.30	10.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	2,948.94	737.23	11.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,178.81	794.70	12.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	3,622.67	905.67	13.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,316.59	1079.15	16.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	5,381.72	1345.43	20.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	6,750.60	1687.65	25.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	8,561.96	2140.49	32.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	10,769.56	2692.39	41.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	12,912.79	2582.56	49.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:54 PM	14,535.97	1162.88	55.4%	0.00	0.00	0.0%	0.00	0.00	0.0%

GAMBLE PARK

Quantitative Shading Calculations for CPHP

NOVEMBER 29

Analysis Hours: 8:04 AM-3:51 PM (PST)

JANUARY 11 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:04 AM	25,961.59	2336.54	98.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	22,630.16	4752.33	86.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	18,620.59	4655.15	70.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	16,108.46	4027.12	61.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	14,900.89	3725.22	56.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	13,502.93	3375.73	51.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	11,704.55	2926.14	44.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	9,933.04	2483.26	37.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	8,234.14	2058.53	31.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	6,957.69	1739.42	26.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,747.25	1436.81	21.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,948.69	1237.17	18.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,309.29	1077.32	16.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	3,833.95	958.49	14.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,420.65	855.16	13.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,269.66	817.42	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,106.77	776.69	11.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,037.33	759.33	11.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	2,951.03	737.76	11.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	2,947.15	736.79	11.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	2,894.32	723.58	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	2,945.57	736.39	11.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,021.85	755.46	11.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,221.12	805.28	12.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,454.06	863.52	13.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	3,974.97	993.74	15.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,730.92	1182.73	18.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	5,909.83	1477.46	22.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	7,352.85	1838.21	28.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	9,285.52	2321.38	35.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	11,698.78	2924.69	44.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	14,003.00	2520.54	53.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:51 PM	15,176.65	758.83	57.8%	0.00	0.00	0.0%	0.00	0.00	0.0%

DECEMBER 6

Analysis Hours: 8:10 AM-3:51 PM (PST)

JANUARY 4 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:10 AM	26,066.44	1042.66	99.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	24,948.89	4241.31	95.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	20,049.31	5012.33	76.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	16,738.36	4184.59	63.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	15,511.11	3877.78	59.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	14,383.55	3595.89	54.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	12,783.62	3195.91	48.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	11,007.00	2751.75	41.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	9,202.23	2300.56	35.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	7,808.67	1952.17	29.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	6,485.26	1621.32	24.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	5,534.39	1383.60	21.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,736.70	1184.17	18.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,196.37	1049.09	16.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,742.59	935.65	14.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,552.62	888.16	13.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,371.39	842.85	12.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,302.46	825.62	12.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,217.44	804.36	12.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,212.89	803.22	12.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,146.68	786.67	12.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,191.49	797.87	12.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,237.62	809.41	12.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,449.31	862.33	13.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,687.62	921.90	14.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,241.69	1060.42	16.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	5,010.46	1252.62	19.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	6,237.35	1559.34	23.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	7,715.01	1928.75	29.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	9,694.17	2423.54	36.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	12,211.46	3052.87	46.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	14,602.80	2482.48	55.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:51 PM	15,607.38	780.37	59.5%	0.00	0.00	0.0%	0.00	0.00	0.0%

GAMBLE PARK

Quantitative Shading Calculations for CPHP

DECEMBER 13

Analysis Hours: 8:15 AM-3:52 PM (PST)

DECEMBER 28 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:15 AM	26,079.42	3129.53	99.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	21,528.50	5382.13	82.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	17,562.42	4390.60	66.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	15,835.92	3958.98	60.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	14,955.25	3738.81	57.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	13,546.16	3386.54	51.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	11,873.21	2968.30	45.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	10,023.12	2505.78	38.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	8,508.16	2127.04	32.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	7,132.94	1783.24	27.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	6,049.37	1512.34	23.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	5,131.56	1282.89	19.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,496.86	1124.21	17.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,970.02	992.50	15.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,748.47	937.12	14.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,570.61	892.65	13.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,496.88	874.22	13.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,397.70	849.43	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,393.16	848.29	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,324.23	831.06	12.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,357.08	839.27	12.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,394.54	848.63	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,583.49	895.87	13.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,825.83	956.46	14.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,358.75	1089.69	16.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	5,118.63	1279.66	19.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	6,329.37	1582.34	24.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	7,787.77	1946.94	29.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	9,734.03	2433.51	37.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	12,330.82	3082.70	47.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	14,768.86	2658.39	56.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:52 PM	15,847.11	950.83	60.4%	0.00	0.00	0.0%	0.00	0.00	0.0%

GAMBLE PARK

Quantitative Shading Calculations for CPHP

DECEMBER 20

Analysis Hours: 8:19 AM-3:54 PM (PST)

WINTER SOLSTICE
DECEMBER 21 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:19 AM	26,075.53	2086.04	99.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	22,809.14	4789.92	86.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	18,511.10	4627.77	70.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	16,058.75	4014.69	61.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	15,293.09	3823.27	58.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	14,031.87	3507.97	53.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	12,454.37	3113.59	47.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	10,599.83	2649.96	40.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	9,006.95	2251.74	34.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	7,577.67	1894.42	28.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	6,414.09	1603.52	24.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	5,425.05	1356.26	20.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,720.24	1180.06	18.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,112.52	1028.13	15.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,846.73	961.68	14.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,662.02	915.50	14.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,580.32	895.08	13.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,476.95	869.24	13.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,473.53	868.38	13.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,399.70	849.92	13.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,423.00	855.75	13.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,439.35	859.84	13.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,606.58	901.65	13.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,832.93	958.23	14.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,305.35	1076.34	16.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	5,038.97	1259.74	19.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	6,173.23	1543.31	23.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	7,582.98	1895.75	28.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	9,450.25	2362.56	36.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	11,962.94	2990.73	45.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	14,356.22	3014.81	54.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:54 PM	15,941.79	1275.34	60.7%	0.00	0.00	0.0%	0.00	0.00	0.0%

THEORETICAL ANNUAL AVAILABLE SUNLIGHT (TAAS)	GAMBLE PARK
Area of Gamble Park	0.60 acres (26,245 sf)
Hours of annual available sunlight	3721.4 hrs
TAAS for Gamble Park	97,669,356 sfh

EXISTING (CURRENT) LEVELS OF SHADOW (ROUGH APPROXIMATE)	GAMBLE PARK
Existing annual total shading on park (sfh)	14,872,388 sfh
Existing shading as percentage of TAAS	15.227%

NEW SHADOW CAST BY THE PROPOSED CPHP PROJECT	GAMBLE PARK
Additional annual shading on Gamble Park from Project	801 sfh
Additional annual shading from Project as percentage of TAAS	0.001%
Combined total annual shading existing + Project (sfh)	14,873,189 sfh
Combined total annual shading from existing + Project as percentage of TAAS	15.228%
Number of days when new shading from Project would occur	42-54 days annually
Dates when new shadow from Project would be cast on Gamble Park	Between 1/26 - 2/21 & 10/19 - 11/14
Annual range in duration of new Project shadow (duration variance +/- 4 min.)	Zero
Range in area of new Project shadow (sf)	Zero to 821 sf
Average daily duration of new Project shadow (when present)	Approx. 4 min.
MAXIMUM NEW SHADING BY THE PROPOSED PROJECT	GAMBLE PARK
Dates of maximum new shading from proposed Project (max sfh)	Feb 8 & Nov 1
Total new shading on date(s) of maximum shading (sfh)	32.30 sfh
Percentage new shadow on date(s) of maximum shading	0.014%
Date and duration of longest duration of new shading (duration variance +/- 4 min.)	Approx. 5 min on Nov 1 & Feb 8
Date and time of largest area of new Project shadow	821 sf on Oct 25/Feb 15 at 4:18 PM
Percentage of Gamble Park covered by largest new shadow	3.127%

GRATTAN ELEMENTARY

Quantitative Shading Calculations for UCSF Parnassus

JUNE 21

Analysis Hours: 6:46 AM-7:36 PM (PDT)

SUMMER SOLSTICE

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:46 AM	18,441.16	2028.53	60.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	16,089.63	3700.61	52.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	14,075.16	3518.79	46.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	12,366.53	3091.63	40.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	10,807.71	2701.93	35.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	9,603.19	2400.80	31.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	8,735.82	2183.96	28.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	7,995.48	1998.87	26.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	7,300.83	1825.21	24.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	6,731.28	1682.82	22.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	6,238.77	1559.69	20.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	5,942.21	1485.55	19.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	5,662.50	1415.63	18.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	5,394.05	1348.51	17.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,144.46	1286.12	16.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	4,892.59	1223.15	16.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,656.73	1164.18	15.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,426.81	1106.70	14.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,208.34	1052.09	13.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	3,993.30	998.32	13.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,784.61	946.15	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,578.38	894.59	11.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,374.28	843.57	11.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,179.22	794.80	10.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,055.34	763.84	10.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	2,993.53	748.38	9.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,150.14	787.53	10.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,347.51	836.88	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,588.28	897.07	11.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,829.00	957.25	12.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,080.66	1020.16	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,330.81	1082.70	14.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,594.05	1148.51	15.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	4,856.23	1214.06	16.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,134.52	1283.63	16.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	5,415.44	1353.86	17.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	5,715.25	1428.81	18.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	6,018.00	1504.50	19.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	6,360.09	1590.02	20.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	6,729.21	1682.30	22.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	7,142.89	1785.72	23.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	7,712.14	1928.03	25.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	8,378.60	2094.65	27.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	9,042.28	2260.57	29.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	9,702.02	2425.50	31.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	10,457.82	2614.46	34.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	11,417.93	2854.48	37.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	12,731.09	3182.77	41.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	14,350.13	3587.53	47.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	16,670.50	4167.62	54.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	19,081.80	5724.54	62.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:36 PM	24,570.16	4422.63	80.8%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN ELEMENTARY

Quantitative Shading Calculations for UCSF Parnassus

JUNE 28

Analysis Hours: 6:48 AM-7:36 PM (PDT)

JUNE 14 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:48 AM	18,390.43	1839.04	60.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	16,387.94	3605.35	53.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	14,303.82	3575.96	47.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	12,585.23	3146.31	41.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	11,000.96	2750.24	36.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	9,747.59	2436.90	32.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	8,837.01	2209.25	29.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	8,093.79	2023.45	26.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	7,385.95	1846.49	24.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	6,803.19	1700.80	22.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	6,290.26	1572.57	20.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	5,987.93	1496.98	19.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	5,704.62	1426.15	18.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	5,432.80	1358.20	17.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,180.16	1295.04	17.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	4,925.00	1231.25	16.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,687.19	1171.80	15.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,455.05	1113.76	14.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,235.41	1058.85	13.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,019.25	1004.81	13.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,809.52	952.38	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,602.78	900.69	11.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,397.55	849.39	11.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,199.80	799.95	10.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,066.70	766.67	10.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,000.04	750.01	9.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,134.44	783.61	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,329.34	832.34	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,569.69	892.42	11.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,809.94	952.48	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,061.82	1015.46	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,312.39	1078.10	14.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,575.52	1143.88	15.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	4,838.44	1209.61	15.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,115.33	1278.83	16.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	5,396.44	1349.11	17.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	5,697.60	1424.40	18.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	6,000.30	1500.07	19.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	6,339.09	1584.77	20.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	6,706.67	1676.67	22.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	7,113.47	1778.37	23.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	7,659.63	1914.91	25.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	8,313.26	2078.32	27.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	8,984.48	2246.12	29.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	9,635.30	2408.82	31.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	10,387.64	2596.91	34.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	11,314.09	2828.52	37.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	12,605.78	3151.45	41.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	14,188.33	3547.08	46.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	16,457.27	4114.32	54.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	18,908.24	5672.47	62.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:36 PM	24,515.88	4412.86	80.7%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN ELEMENTARY

Quantitative Shading Calculations for UCSF Parnassus

JULY 5

Analysis Hours: 6:52 AM-7:36 PM (PDT)

JUNE 7 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:52 AM	18,231.91	1093.91	60.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	16,798.03	3191.62	55.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	14,633.03	3658.26	48.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	12,895.55	3223.89	42.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	11,292.03	2823.01	37.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	9,972.25	2493.06	32.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	8,994.86	2248.71	29.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	8,251.21	2062.80	27.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	7,516.81	1879.20	24.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	6,907.49	1726.87	22.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	6,381.89	1595.47	21.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	6,069.13	1517.28	20.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	5,776.29	1444.07	19.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	5,497.25	1374.31	18.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,234.04	1308.51	17.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	4,973.19	1243.30	16.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,730.62	1182.65	15.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,495.15	1123.79	14.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,272.38	1068.09	14.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,053.62	1013.40	13.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,841.34	960.34	12.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,632.00	908.00	11.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,425.49	856.37	11.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,223.70	805.92	10.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,084.50	771.12	10.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,012.30	753.07	9.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,130.26	782.57	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,326.16	831.54	10.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,565.64	891.41	11.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,806.53	951.63	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,059.87	1014.97	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,312.06	1078.02	14.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,575.80	1143.95	15.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	4,839.87	1209.97	15.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,119.99	1280.00	16.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	5,402.63	1350.66	17.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	5,705.87	1426.47	18.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	6,015.32	1503.83	19.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	6,351.92	1587.98	20.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	6,722.52	1680.63	22.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	7,132.55	1783.14	23.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	7,630.64	1907.66	25.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	8,275.32	2068.83	27.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	8,940.37	2235.09	29.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	9,585.09	2396.27	31.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	10,332.86	2583.21	34.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	11,260.13	2815.03	37.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	12,527.92	3131.98	41.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	14,099.00	3524.75	46.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	16,383.09	4095.77	53.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	18,896.97	5669.09	62.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:36 PM	24,337.07	4380.67	80.1%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN ELEMENTARY

Quantitative Shading Calculations for UCSF Parnassus

JULY 12

Analysis Hours: 6:56 AM-7:33 PM (PDT)

MAY 31 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
6:56 AM	17,976.88	539.31	59.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 AM	17,291.44	2593.72	56.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	15,054.48	3763.62	49.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	13,302.88	3325.72	43.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	11,687.53	2921.88	38.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	10,286.83	2571.71	33.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	9,219.44	2304.86	30.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	8,450.17	2112.54	27.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	7,700.51	1925.13	25.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	7,044.50	1761.13	23.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	6,532.34	1633.09	21.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	6,184.04	1546.01	20.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	5,877.34	1469.33	19.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	5,585.75	1396.44	18.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,305.06	1326.27	17.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,036.11	1259.03	16.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,786.68	1196.67	15.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,545.77	1136.44	15.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,317.84	1079.46	14.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,095.01	1023.75	13.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,879.02	969.75	12.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,666.53	916.63	12.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,456.80	864.20	11.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,251.93	812.98	10.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,106.42	776.61	10.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,029.46	757.36	10.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,137.58	784.40	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,336.43	834.11	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,577.85	894.46	11.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,820.34	955.09	12.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,075.56	1018.89	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,330.38	1082.59	14.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,596.85	1149.21	15.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	4,863.45	1215.86	16.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,147.21	1286.80	16.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	5,433.74	1358.44	17.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	5,741.82	1435.45	18.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	6,061.95	1515.49	19.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	6,403.73	1600.93	21.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	6,777.53	1694.38	22.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	7,193.31	1798.33	23.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	7,629.19	1907.30	25.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	8,269.06	2067.27	27.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	8,899.08	2224.77	29.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	9,550.84	2387.71	31.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	10,292.12	2573.03	33.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	11,247.30	2811.82	37.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	12,494.53	3123.63	41.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	14,080.50	3520.13	46.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	16,422.67	4105.67	54.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	19,093.57	5346.20	62.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:33 PM	24,049.06	3607.36	79.1%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN ELEMENTARY

Quantitative Shading Calculations for UCSF Parnassus

JULY 19

Analysis Hours: 7:01 AM-7:30 PM (PDT)

MAY 24 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:01 AM	17,650.12	2294.52	58.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:16 AM	15,404.10	3696.98	50.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	13,780.89	3307.41	45.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	12,173.78	3043.44	40.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	10,686.03	2671.51	35.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	9,524.55	2381.14	31.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	8,705.45	2176.36	28.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	7,927.00	1981.75	26.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	7,209.65	1802.41	23.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	6,719.43	1679.86	22.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	6,326.86	1581.71	20.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	6,002.75	1500.69	19.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	5,684.03	1421.01	18.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,389.39	1347.35	17.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,110.07	1277.52	16.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,851.02	1212.75	16.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,603.44	1150.86	15.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,368.99	1092.25	14.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,140.76	1035.19	13.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,919.70	979.92	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,703.21	925.80	12.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,489.32	872.33	11.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,280.34	820.08	10.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,129.23	782.31	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,050.84	762.71	10.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,159.39	789.85	10.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,363.62	840.91	11.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,607.40	901.85	11.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,852.88	963.22	12.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,111.19	1027.80	13.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,369.72	1092.43	14.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,641.25	1160.31	15.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	4,913.21	1228.30	16.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,201.39	1300.35	17.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	5,493.48	1373.37	18.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	5,809.16	1452.29	19.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	6,137.94	1534.48	20.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	6,498.75	1624.69	21.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	6,876.86	1719.21	22.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	7,301.31	1825.33	24.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	7,730.59	1932.65	25.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	8,304.69	2076.17	27.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	8,877.53	2219.38	29.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	9,545.60	2386.40	31.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	10,281.35	2570.34	33.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	11,296.53	2824.13	37.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	12,519.78	3129.95	41.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	14,162.32	3540.58	46.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	16,625.19	4156.30	54.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	19,488.72	4872.18	64.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 PM	23,637.83	3072.92	77.8%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN ELEMENTARY

Quantitative Shading Calculations for UCSF Parnassus

JULY 26

Analysis Hours: 7:07 AM-7:25 PM (PDT)

MAY 17 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:07 AM	17,411.34	1044.68	57.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	16,219.70	3081.74	53.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	14,368.66	3592.16	47.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	12,780.87	3195.22	42.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	11,217.53	2804.38	36.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	9,942.07	2485.52	32.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	9,019.32	2254.83	29.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	8,194.42	2048.61	27.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	7,466.66	1866.66	24.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	6,942.99	1735.75	22.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	6,499.88	1624.97	21.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	6,139.78	1534.94	20.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	5,797.76	1449.44	19.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,487.14	1371.79	18.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,195.16	1298.79	17.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,926.00	1231.50	16.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,669.41	1167.35	15.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,427.06	1106.77	14.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,191.81	1047.95	13.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	3,964.92	991.23	13.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,742.49	935.62	12.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,523.07	880.77	11.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,309.25	827.31	10.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,155.07	788.77	10.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,076.75	769.19	10.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,194.75	798.69	10.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,405.98	851.49	11.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,653.44	913.36	12.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,903.16	975.79	12.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,166.61	1041.65	13.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,429.96	1107.49	14.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,706.81	1176.70	15.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	4,984.57	1246.14	16.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,279.57	1319.89	17.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	5,580.15	1395.04	18.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	5,905.63	1476.41	19.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	6,246.15	1561.54	20.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	6,622.15	1655.54	21.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	7,026.30	1756.58	23.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	7,456.41	1864.10	24.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	7,899.66	1974.91	26.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	8,357.42	2089.36	27.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	8,877.19	2219.30	29.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	9,553.48	2388.37	31.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	10,328.30	2582.07	34.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	11,365.42	2841.36	37.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	12,596.62	3149.15	41.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	14,369.55	3592.39	47.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	16,958.03	4239.51	55.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	20,080.68	4216.94	66.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:25 PM	23,080.97	2077.29	75.9%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN ELEMENTARY

Quantitative Shading Calculations for UCSF Parnassus

AUGUST 2

Analysis Hours: 7:12 AM-7:18 PM (PDT)

MAY 10 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:12 AM	17,276.79	345.54	56.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 AM	16,920.88	2538.13	55.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	15,012.27	3753.07	49.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	13,457.28	3364.32	44.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	11,894.70	2973.67	39.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	10,453.32	2613.33	34.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	9,371.59	2342.90	30.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	8,517.02	2129.25	28.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	7,770.20	1942.55	25.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	7,192.33	1798.08	23.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	6,676.90	1669.23	22.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	6,285.47	1571.37	20.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	5,921.55	1480.39	19.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,593.09	1398.27	18.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,287.32	1321.83	17.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	5,005.23	1251.31	16.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,737.84	1184.46	15.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,486.51	1121.63	14.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,243.35	1060.84	14.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,009.41	1002.35	13.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,779.85	944.96	12.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,554.86	888.71	11.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,335.35	833.84	11.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,180.73	795.18	10.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,106.59	776.65	10.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,248.36	812.09	10.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,467.62	866.91	11.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,721.11	930.28	12.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	3,974.82	993.70	13.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,244.33	1061.08	14.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,514.30	1128.58	14.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,797.48	1199.37	15.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	5,084.12	1271.03	16.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,388.05	1347.01	17.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	5,699.77	1424.94	18.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	6,038.42	1509.61	19.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	6,393.57	1598.39	21.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	6,789.38	1697.34	22.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	7,217.55	1804.39	23.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	7,664.90	1916.23	25.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	8,132.19	2033.05	26.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	8,515.59	2128.90	28.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	8,911.05	2227.76	29.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	9,537.02	2384.25	31.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	10,428.20	2607.05	34.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	11,497.99	2874.50	37.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	12,858.55	3214.64	42.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	14,779.34	3694.83	48.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:00 PM	17,565.47	4391.37	57.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:15 PM	21,264.88	3189.73	70.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:18 PM	22,424.65	672.74	73.8%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN ELEMENTARY

Quantitative Shading Calculations for UCSF Parnassus

AUGUST 9

Analysis Hours: 7:19 AM-7:10 PM (PDT)

MAY 3 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:19 AM	17,271.91	1554.47	56.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	15,814.11	3320.96	52.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	14,280.25	3570.06	47.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	12,684.03	3171.01	41.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	11,044.97	2761.24	36.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	9,785.25	2446.31	32.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	8,930.10	2232.53	29.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	8,117.44	2029.36	26.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	7,444.74	1861.19	24.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	6,868.28	1717.07	22.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	6,444.87	1611.22	21.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	6,057.02	1514.25	19.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,708.54	1427.13	18.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,386.31	1346.58	17.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	5,090.47	1272.62	16.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,811.07	1202.77	15.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,548.89	1137.22	15.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,296.46	1074.12	14.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,054.02	1013.50	13.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,817.75	954.44	12.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,585.35	896.34	11.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,359.80	839.95	11.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,208.17	802.04	10.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,142.89	785.72	10.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,317.66	829.42	10.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,546.14	886.53	11.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,806.60	951.65	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	4,068.19	1017.05	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,344.39	1086.10	14.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,621.36	1155.34	15.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	4,913.24	1228.31	16.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	5,210.06	1302.52	17.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,524.87	1381.22	18.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	5,850.59	1462.65	19.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	6,204.89	1551.22	20.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	6,580.18	1645.04	21.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	6,999.73	1749.93	23.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	7,445.56	1861.39	24.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	7,915.54	1978.88	26.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	8,406.84	2101.71	27.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	8,721.39	2180.35	28.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	9,078.92	2269.73	29.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	9,558.87	2389.72	31.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	10,553.69	2638.42	34.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	11,711.27	2927.82	38.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	13,260.04	3315.01	43.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	15,414.03	5240.77	50.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:10 PM	21,613.25	4538.78	71.1%	0.00	0.00	0.0%	0.00	0.00	0.0%

AUGUST 16

Analysis Hours: 7:25 AM-7:02 PM (PDT)

APRIL 26 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:25 AM	17,558.00	702.32	57.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:30 AM	16,961.53	2883.46	55.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	15,240.96	3810.24	50.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	13,564.75	3391.19	44.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	11,753.41	2938.35	38.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	10,410.03	2602.51	34.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	9,401.93	2350.48	30.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	8,487.24	2121.81	27.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	7,719.28	1929.82	25.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	7,097.64	1774.41	23.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	6,621.03	1655.26	21.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	6,206.43	1551.61	20.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,835.31	1458.83	19.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,494.13	1373.53	18.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	5,182.75	1295.69	17.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,889.78	1222.44	16.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,615.71	1153.93	15.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,353.00	1088.25	14.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,100.82	1025.20	13.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,855.20	963.80	12.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,615.22	903.80	11.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,384.41	846.10	11.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,239.97	809.99	10.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,203.45	800.86	10.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,402.59	850.65	11.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,641.36	910.34	12.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	3,908.48	977.12	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	4,177.69	1044.42	13.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,463.16	1115.79	14.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,748.73	1187.18	15.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	5,051.49	1262.87	16.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	5,359.60	1339.90	17.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,688.87	1422.22	18.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	6,029.94	1507.49	19.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	6,404.46	1601.11	21.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	6,805.36	1701.34	22.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	7,257.74	1814.44	23.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	7,719.81	1929.95	25.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	8,216.84	2054.21	27.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	8,626.75	2156.69	28.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	8,969.55	2242.39	29.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	9,246.19	2311.55	30.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	9,707.09	2426.77	31.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	10,656.69	2664.17	35.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	12,031.23	3007.81	39.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	13,817.84	3454.46	45.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	16,108.98	4349.42	53.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:02 PM	20,676.89	2894.76	68.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN ELEMENTARY

Quantitative Shading Calculations for UCSF Parnassus

AUGUST 23

Analysis Hours: 7:31 AM-6:52 PM (PDT)

APRIL 19 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:31 AM	18,175.38	1999.29	59.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	16,277.36	3743.79	53.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	14,452.03	3613.01	47.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	12,703.91	3175.98	41.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	11,087.64	2771.91	36.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	9,875.99	2469.00	32.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	8,862.98	2215.74	29.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	8,007.23	2001.81	26.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	7,335.16	1833.79	24.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	6,805.09	1701.27	22.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	6,362.12	1590.53	20.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,966.46	1491.61	19.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,604.39	1401.10	18.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	5,276.19	1319.05	17.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,967.41	1241.85	16.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,680.61	1170.15	15.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,405.63	1101.41	14.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,143.61	1035.90	13.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,888.54	972.13	12.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,639.81	909.95	12.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,404.68	851.17	11.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,274.26	818.57	10.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,291.91	822.98	10.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,508.62	877.15	11.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,758.10	939.53	12.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	4,034.07	1008.52	13.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	4,313.48	1078.37	14.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,607.60	1151.90	15.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	4,904.14	1226.04	16.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	5,220.57	1305.14	17.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	5,541.62	1385.40	18.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	5,887.12	1471.78	19.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	6,247.87	1561.97	20.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	6,647.43	1661.86	21.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	7,081.21	1770.30	23.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	7,552.87	1888.22	24.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	8,038.28	2009.57	26.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	8,544.39	2136.10	28.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	8,895.19	2223.80	29.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	9,222.03	2305.51	30.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	9,517.13	2379.28	31.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	10,029.41	2507.35	33.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	10,857.18	2714.29	35.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	12,517.98	3129.49	41.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	14,552.32	3638.08	47.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:45 PM	17,575.15	3339.28	57.8%	7,190.80	1366.25	23.7%	0.00	0.00	0.0%
6:52 PM	19,621.03	1177.26	64.5%	4,637.91	278.27	15.3%	0.00	0.00	0.0%

GRATTAN ELEMENTARY

Quantitative Shading Calculations for UCSF Parnassus

AUGUST 30

Analysis Hours: 7:37 AM-6:42 PM (PDT)

APRIL 12 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:37 AM	18,520.39	1111.22	60.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	17,379.90	3302.18	57.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	15,512.50	3878.13	51.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	13,693.48	3423.37	45.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	11,801.98	2950.50	38.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	10,390.60	2597.65	34.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	9,283.34	2320.84	30.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	8,331.73	2082.93	27.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	7,597.76	1899.44	25.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	7,010.32	1752.58	23.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	6,534.12	1633.53	21.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	6,110.90	1527.73	20.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,724.95	1431.24	18.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	5,377.87	1344.47	17.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	5,051.95	1262.99	16.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,750.25	1187.56	15.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,462.22	1115.55	14.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,188.56	1047.14	13.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,922.73	980.68	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,664.33	916.08	12.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,434.14	858.54	11.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,318.14	829.53	10.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,393.23	848.31	11.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,630.03	907.51	11.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	3,890.57	972.64	12.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	4,178.61	1044.65	13.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	4,466.62	1116.65	14.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,773.31	1193.33	15.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	5,082.24	1270.56	16.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	5,412.43	1353.11	17.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	5,749.15	1437.29	18.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	6,114.40	1528.60	20.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	6,500.09	1625.02	21.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	6,932.70	1733.17	22.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	7,402.42	1850.61	24.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	7,887.42	1971.86	25.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	8,410.91	2102.73	27.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	8,822.23	2205.56	29.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	9,189.87	2297.47	30.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	9,461.08	2365.27	31.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	9,849.13	2462.28	32.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	10,383.50	2595.88	34.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	11,318.75	2829.69	37.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	13,139.50	3284.88	43.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:30 PM	15,751.23	3622.78	51.8%	1.26	0.29	0.0%	0.00	0.00	0.0%
6:42 PM	18,912.69	2080.40	62.2%	11,322.41	1245.47	37.2%	0.00	0.00	0.0%

SEPTEMBER 6

Analysis Hours: 7:44 AM-6:31 PM (PDT)

APRIL 5 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:44 AM	18,882.50	2454.72	62.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	16,502.43	4125.61	54.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	14,665.87	3666.47	48.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	12,595.24	3148.81	41.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	10,982.38	2745.59	36.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	9,764.42	2441.11	32.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	8,711.79	2177.95	28.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	7,886.05	1971.51	25.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	7,236.34	1809.09	23.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	6,722.10	1680.53	22.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	6,268.21	1567.05	20.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,855.80	1463.95	19.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	5,488.16	1372.04	18.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	5,142.56	1285.64	16.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,824.76	1206.19	15.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,522.06	1130.52	14.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,235.35	1058.84	13.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,957.14	989.28	13.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,687.79	921.95	12.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,466.79	866.70	11.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,368.12	842.03	11.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,507.48	876.87	11.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,767.05	941.76	12.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	4,040.26	1010.07	13.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	4,338.28	1084.57	14.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	4,638.38	1159.59	15.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	4,957.94	1239.49	16.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	5,281.64	1320.41	17.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	5,627.98	1407.00	18.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	5,982.55	1495.64	19.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	6,373.24	1593.31	21.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	6,788.38	1697.09	22.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	7,261.48	1815.37	23.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	7,744.84	1936.21	25.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	8,266.19	2066.55	27.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	8,737.02	2184.25	28.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	9,159.27	2289.82	30.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	9,431.64	2357.91	31.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	9,832.53	2458.13	32.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	10,277.53	2569.38	33.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	10,865.38	2716.34	35.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	11,886.68	2971.67	39.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	14,035.89	3789.69	46.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:31 PM	18,473.23	2586.25	60.8%	11,865.89	1661.22	39.0%	0.00	0.00	0.0%

SEPTEMBER 13

Analysis Hours: 7:50 AM-6:21 PM (PDT)

MARCH 29 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:50 AM	19,087.03	1526.96	62.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	17,559.69	3687.54	57.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	15,624.21	3906.05	51.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	13,541.55	3385.39	44.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	11,705.32	2926.33	38.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	10,316.34	2579.09	33.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	9,144.34	2286.09	30.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	8,202.41	2050.60	27.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	7,481.32	1870.33	24.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	6,925.60	1731.40	22.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	6,438.36	1609.59	21.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,996.28	1499.07	19.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	5,605.46	1401.37	18.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	5,239.75	1309.94	17.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,903.55	1225.89	16.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,584.83	1146.21	15.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,283.98	1070.99	14.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	3,992.19	998.05	13.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,711.84	927.96	12.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,500.80	875.20	11.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,438.64	859.66	11.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,635.62	908.90	12.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	3,919.34	979.83	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	4,204.78	1051.19	13.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	4,516.44	1129.11	14.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	4,829.23	1207.31	15.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	5,163.53	1290.88	17.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	5,503.54	1375.88	18.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	5,866.89	1466.72	19.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	6,245.56	1561.39	20.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	6,666.27	1666.57	21.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	7,119.25	1779.81	23.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	7,621.41	1905.35	25.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	8,125.82	2031.46	26.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	8,661.35	2165.34	28.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	9,088.60	2272.15	29.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	9,424.00	2356.00	31.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	9,770.37	2442.59	32.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	10,217.56	2554.39	33.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	10,763.50	2690.88	35.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	11,507.09	2876.77	37.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	12,681.67	3170.42	41.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:15 PM	15,938.41	2868.91	52.4%	2,074.08	373.33	6.8%	0.00	0.00	0.0%
6:21 PM	18,258.47	912.92	60.1%	8,548.76	427.44	28.1%	0.00	0.00	0.0%

SEPTEMBER 20

Analysis Hours: 7:57 AM-6:09 PM (PDT)

APPROXIMATE EQUINOXES
MARCH 22 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:57 AM	19,348.42	386.97	63.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	18,759.99	2814.00	61.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	16,580.90	4145.23	54.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	14,579.96	3644.99	48.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	12,554.53	3138.63	41.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	10,938.03	2734.51	36.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	9,606.46	2401.62	31.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	8,563.05	2140.76	28.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	7,763.22	1940.80	25.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	7,148.05	1787.01	23.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	6,622.86	1655.71	21.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	6,148.16	1537.04	20.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	5,732.05	1433.01	18.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	5,342.87	1335.72	17.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,987.97	1246.99	16.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,650.26	1162.57	15.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,333.72	1083.43	14.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	4,027.73	1006.93	13.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,736.74	934.19	12.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,544.35	886.09	11.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,566.82	891.70	11.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,782.38	945.59	12.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	4,086.59	1021.65	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	4,385.71	1096.43	14.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	4,710.80	1177.70	15.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	5,038.61	1259.65	16.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	5,389.89	1347.47	17.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	5,744.11	1436.03	18.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	6,131.27	1532.82	20.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	6,537.09	1634.27	21.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	6,992.39	1748.10	23.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	7,490.84	1872.71	24.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	8,006.80	2001.70	26.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	8,550.59	2137.65	28.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	9,019.81	2254.95	29.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	9,409.82	2352.46	31.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	9,714.64	2428.66	32.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	10,114.01	2528.50	33.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	10,620.80	2655.20	34.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	11,305.79	2826.45	37.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	12,284.84	3071.21	40.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:00 PM	14,452.96	3035.12	47.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
6:09 PM	17,775.80	1422.06	58.5%	0.00	0.00	0.0%	0.00	0.00	0.0%

SEPTEMBER 27

Analysis Hours: 8:03 AM-5:58 PM (PDT)

MARCH 15 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:03 AM	20,067.96	2006.80	66.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	17,905.01	3939.10	58.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	15,801.02	3950.25	52.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	13,595.53	3398.88	44.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	11,653.30	2913.32	38.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	10,148.57	2537.14	33.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	8,987.09	2246.77	29.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	8,084.95	2021.24	26.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	7,391.25	1847.81	24.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	6,823.79	1705.95	22.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	6,312.34	1578.08	20.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	5,868.05	1467.01	19.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	5,454.03	1363.51	17.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	5,077.50	1269.37	16.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,719.21	1179.80	15.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,386.39	1096.60	14.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	4,065.57	1016.39	13.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,765.15	941.29	12.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,602.75	900.69	11.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,716.06	929.02	12.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	3,966.80	991.70	13.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	4,276.45	1069.11	14.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	4,582.87	1145.72	15.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	4,924.41	1231.10	16.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	5,267.26	1316.82	17.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	5,635.07	1408.77	18.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	6,010.30	1502.58	19.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	6,424.43	1606.11	21.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	6,861.52	1715.38	22.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	7,361.55	1840.39	24.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	7,880.22	1970.05	25.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	8,427.81	2106.95	27.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	8,932.09	2233.02	29.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	9,405.20	2351.30	30.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	9,690.75	2422.69	31.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	10,052.53	2513.13	33.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	10,486.92	2621.73	34.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	11,070.87	2767.72	36.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	11,889.87	2972.47	39.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:45 PM	13,438.84	3090.93	44.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:58 PM	17,536.78	1929.05	57.7%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN ELEMENTARY

Quantitative Shading Calculations for UCSF Parnassus

OCTOBER 4

Analysis Hours: 8:09 AM-5:47 PM (PDT)

MARCH 8 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:09 AM	21,503.23	860.13	70.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	20,193.80	3432.95	66.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	17,461.24	4365.31	57.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	14,970.46	3742.62	49.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	12,663.71	3165.93	41.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	10,846.90	2711.73	35.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	9,507.64	2376.91	31.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	8,468.75	2117.19	27.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	7,666.06	1916.52	25.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	7,049.65	1762.41	23.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	6,496.61	1624.15	21.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	6,021.11	1505.28	19.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	5,579.09	1394.77	18.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	5,178.57	1294.64	17.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,796.94	1199.24	15.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,446.35	1111.59	14.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	4,109.05	1027.26	13.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,813.60	953.40	12.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,675.64	918.91	12.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	3,848.41	962.10	12.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	4,095.96	1023.99	13.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	4,445.00	1111.25	14.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	4,791.34	1197.84	15.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	5,149.07	1287.27	16.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	5,506.70	1376.67	18.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	5,895.28	1473.82	19.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	6,294.61	1573.65	20.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	6,738.99	1684.75	22.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	7,212.69	1803.17	23.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	7,753.16	1938.29	25.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	8,284.50	2071.13	27.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	8,830.05	2207.51	29.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	9,314.82	2328.71	30.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	9,730.39	2432.60	32.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	10,068.39	2517.10	33.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	10,480.21	2620.05	34.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	10,962.53	2740.63	36.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	11,674.94	2918.73	38.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	12,679.12	3423.36	41.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:47 PM	16,462.27	2304.72	54.2%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN ELEMENTARY

Quantitative Shading Calculations for UCSF Parnassus

OCTOBER 11

Analysis Hours: 8:16 AM-5:37 PM (PDT)

MARCH 1 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:16 AM	22,335.55	2680.27	73.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	19,718.27	4732.38	64.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	16,912.34	4228.09	55.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	14,111.57	3527.89	46.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	11,972.88	2993.22	39.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	10,251.34	2562.84	33.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	8,945.12	2236.28	29.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	7,984.50	1996.12	26.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	7,304.80	1826.20	24.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	6,704.84	1676.21	22.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	6,192.91	1548.23	20.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	5,719.84	1429.96	18.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	5,292.10	1323.03	17.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,885.56	1221.39	16.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,515.44	1128.86	14.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	4,160.96	1040.24	13.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,869.59	967.40	12.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,769.29	942.32	12.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	4,017.30	1004.33	13.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	4,310.98	1077.74	14.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	4,659.93	1164.98	15.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	5,005.26	1251.32	16.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	5,378.57	1344.64	17.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	5,755.50	1438.88	18.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	6,165.98	1541.50	20.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	6,590.83	1647.71	21.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	7,069.29	1767.32	23.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	7,587.46	1896.87	25.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	8,145.64	2036.41	26.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	8,710.16	2177.54	28.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	9,219.09	2304.77	30.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	9,708.60	2427.15	31.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	10,116.70	2529.17	33.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	10,533.41	2633.35	34.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	11,033.49	2758.37	36.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	11,766.80	2941.70	38.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	12,723.45	3180.86	41.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:30 PM	14,730.77	2798.85	48.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:37 PM	17,393.62	1043.62	57.2%	0.00	0.00	0.0%	0.00	0.00	0.0%

OCTOBER 18

Analysis Hours: 8:22 AM-5:27 PM (PDT)

FEBRUARY 22 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:22 AM	22,905.48	1374.33	75.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	21,625.43	3892.58	71.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	18,996.62	4749.15	62.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	15,894.21	3973.55	52.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	13,377.71	3344.43	44.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	11,244.34	2811.09	37.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	9,728.05	2432.01	32.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	8,496.64	2124.16	28.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	7,643.27	1910.82	25.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	6,934.62	1733.66	22.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	6,382.50	1595.62	21.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	5,879.40	1469.85	19.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	5,422.14	1355.54	17.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,987.29	1246.82	16.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,596.26	1149.07	15.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	4,224.07	1056.02	13.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	3,933.71	983.43	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	3,910.19	977.55	12.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	4,175.46	1043.87	13.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	4,494.32	1123.58	14.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	4,858.06	1214.52	16.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	5,219.69	1304.92	17.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	5,611.02	1402.75	18.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	6,008.09	1502.02	19.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	6,442.78	1610.69	21.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	6,897.05	1724.26	22.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	7,413.07	1853.27	24.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	7,961.78	1990.44	26.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	8,533.84	2133.46	28.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	9,066.57	2266.64	29.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	9,618.19	2404.55	31.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	10,103.55	2525.89	33.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	10,610.71	2652.68	34.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:30 PM	11,140.98	2785.25	36.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:45 PM	11,901.75	2975.44	39.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:00 PM	12,908.23	3227.06	42.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:15 PM	14,364.74	3160.24	47.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
5:27 PM	18,511.08	1851.11	60.9%	0.00	0.00	0.0%	0.00	0.00	0.0%

GRATTAN ELEMENTARY

Quantitative Shading Calculations for UCSF Parnassus

OCTOBER 25

Analysis Hours: 7:30 AM-4:18 PM (PST)

FEBRUARY 15 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:30 AM	23,440.73	3047.29	77.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	20,755.38	5188.84	68.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	17,696.57	4424.14	58.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	15,047.92	3761.98	49.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	12,613.59	3153.40	41.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	10,804.85	2701.21	35.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	9,272.44	2318.11	30.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	8,188.65	2047.16	26.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	7,367.71	1841.93	24.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	6,700.69	1675.17	22.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	6,095.12	1523.78	20.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,568.67	1392.17	18.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,100.58	1275.15	16.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,686.66	1171.66	15.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,294.80	1073.70	14.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,011.19	1002.80	13.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,055.63	1013.91	13.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,330.13	1082.53	14.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	4,668.79	1167.20	15.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	5,048.14	1262.04	16.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	5,423.50	1355.88	17.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	5,833.31	1458.33	19.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	6,248.14	1562.03	20.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	6,708.09	1677.02	22.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	7,190.83	1797.71	23.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	7,749.01	1937.25	25.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	8,309.28	2077.32	27.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	8,900.67	2225.17	29.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	9,433.73	2358.43	31.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	10,022.82	2505.70	33.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	10,578.38	2644.59	34.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	11,269.10	2817.28	37.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	12,070.27	3017.57	39.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	13,164.13	3291.03	43.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	14,424.49	3606.12	47.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:15 PM	17,437.55	2615.63	57.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:18 PM	19,572.19	587.17	64.4%	0.00	0.00	0.0%	0.00	0.00	0.0%

NOVEMBER 1

Analysis Hours: 7:36 AM-4:10 PM (PST)

FEBRUARY 8 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:36 AM	23,855.47	1669.88	78.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	22,334.75	4243.60	73.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	19,480.13	4870.03	64.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	16,572.42	4143.11	54.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	14,150.42	3537.61	46.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	12,187.36	3046.84	40.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	10,445.13	2611.28	34.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	9,144.16	2286.04	30.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	8,009.61	2002.40	26.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	7,181.23	1795.31	23.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	6,478.54	1619.63	21.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	5,887.39	1471.85	19.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,323.84	1330.96	17.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	4,846.99	1211.75	15.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,393.57	1098.39	14.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,101.36	1025.34	13.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,194.19	1048.55	13.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,477.93	1119.48	14.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	4,833.24	1208.31	15.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	5,226.25	1306.56	17.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	5,616.73	1404.18	18.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	6,042.44	1510.61	19.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	6,476.52	1619.13	21.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	6,961.48	1740.37	22.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	7,473.71	1868.43	24.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	8,062.82	2015.70	26.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	8,637.31	2159.33	28.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	9,244.22	2311.05	30.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	9,842.23	2460.56	32.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	10,572.53	2643.13	34.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	11,351.34	2837.84	37.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	12,210.30	3052.58	40.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	13,126.01	3281.50	43.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	14,023.33	3505.83	46.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	15,897.00	3338.37	52.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:10 PM	30,388.70	2734.98	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

NOVEMBER 8

Analysis Hours: 7:43 AM-4:03 PM (PST)

FEBRUARY 1 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:43 AM	24,145.33	241.45	79.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
7:45 AM	23,923.07	3110.00	78.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	21,296.50	5324.12	70.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	18,424.57	4606.14	60.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	15,798.03	3949.51	52.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	13,650.69	3412.67	44.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	11,854.80	2963.70	39.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	10,388.21	2597.05	34.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	9,007.96	2251.99	29.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	7,970.77	1992.69	26.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	7,053.64	1763.41	23.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	6,327.63	1581.91	20.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	5,655.05	1413.76	18.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	5,120.98	1280.25	16.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,630.53	1157.63	15.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,322.61	1080.65	14.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,407.57	1101.89	14.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,684.59	1171.15	15.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	5,026.63	1256.66	16.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	5,426.82	1356.70	17.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	5,815.44	1453.86	19.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	6,261.50	1565.38	20.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	6,705.60	1676.40	22.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	7,223.65	1805.91	23.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	7,758.77	1939.69	25.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	8,371.30	2092.83	27.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	8,967.92	2241.98	29.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	9,584.58	2396.15	31.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	10,288.14	2572.04	33.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	11,201.28	2800.32	36.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	12,120.94	3030.23	39.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	13,078.74	3269.69	43.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	13,867.96	3466.99	45.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	15,140.87	3785.22	49.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:00 PM	30,388.70	4558.30	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
4:03 PM	30,388.70	911.66	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

NOVEMBER 15

Analysis Hours: 7:51 AM-3:57 PM (PST)

JANUARY 25 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:51 AM	24,526.94	1962.16	80.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	23,034.67	4606.93	75.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	20,288.59	5072.15	66.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	17,619.88	4404.97	58.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	15,271.94	3817.99	50.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	13,262.69	3315.67	43.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	11,703.33	2925.83	38.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	10,200.71	2550.18	33.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	8,957.44	2239.36	29.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	7,854.39	1963.60	25.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	7,000.50	1750.13	23.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	6,164.12	1541.03	20.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	5,502.61	1375.65	18.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	4,924.90	1231.23	16.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,573.91	1143.48	15.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,650.30	1162.58	15.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	4,933.13	1233.28	16.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	5,276.57	1319.14	17.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	5,689.89	1422.47	18.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	6,084.39	1521.10	20.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	6,546.87	1636.72	21.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	7,009.64	1752.41	23.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	7,566.81	1891.70	24.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	8,124.17	2031.04	26.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	8,791.72	2197.93	28.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	9,442.62	2360.66	31.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	10,052.30	2513.07	33.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	10,806.53	2701.63	35.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	11,761.20	2940.30	38.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	12,774.55	3193.64	42.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	13,792.14	3448.04	45.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	14,581.91	3645.48	48.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	16,349.34	3760.35	53.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:57 PM	30,388.70	3342.76	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

NOVEMBER 22

Analysis Hours: 7:57 AM-3:54 PM (PST)

JANUARY 18 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
7:57 AM	25,219.52	504.39	83.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:00 AM	24,828.58	3724.29	81.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	22,105.59	5526.40	72.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	19,390.05	4847.51	63.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	17,059.03	4264.76	56.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	14,843.88	3710.97	48.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	13,077.07	3269.27	43.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	11,371.23	2842.81	37.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	10,009.98	2502.49	32.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	8,754.39	2188.60	28.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	7,769.50	1942.37	25.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	6,806.49	1701.62	22.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	6,035.26	1508.82	19.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	5,351.61	1337.90	17.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	4,915.49	1228.87	16.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	4,930.57	1232.64	16.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	5,218.35	1304.59	17.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	5,547.41	1386.85	18.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	5,975.90	1493.98	19.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	6,372.90	1593.23	21.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	6,865.73	1716.43	22.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	7,350.41	1837.60	24.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	7,954.54	1988.63	26.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	8,527.95	2131.99	28.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	9,243.14	2310.79	30.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	9,911.28	2477.82	32.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	10,506.98	2626.75	34.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	11,233.23	2808.31	37.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	12,184.39	3046.10	40.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	13,345.64	3336.41	43.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	14,507.75	3626.94	47.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	15,550.52	3887.63	51.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	18,790.94	3758.19	61.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:54 PM	30,388.69	2431.10	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

NOVEMBER 29

Analysis Hours: 8:04 AM-3:51 PM (PST)

JANUARY 11 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:04 AM	25,879.89	2329.19	85.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	23,808.27	4999.74	78.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	21,003.09	5250.77	69.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	18,677.32	4669.33	61.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	16,343.31	4085.83	53.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	14,516.37	3629.09	47.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	12,665.00	3166.25	41.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	11,051.10	2762.78	36.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	9,616.29	2404.07	31.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	8,525.61	2131.40	28.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	7,482.02	1870.50	24.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	6,608.95	1652.24	21.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	5,831.23	1457.81	19.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	5,314.90	1328.73	17.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	5,253.83	1313.46	17.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	5,518.14	1379.53	18.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	5,785.86	1446.46	19.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	6,257.12	1564.28	20.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	6,676.12	1669.03	22.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	7,199.13	1799.78	23.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	7,701.04	1925.26	25.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	8,337.13	2084.28	27.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	8,915.00	2228.75	29.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	9,641.81	2410.45	31.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	10,288.99	2572.25	33.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	10,865.82	2716.46	35.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	11,535.01	2883.75	37.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	12,600.39	3150.10	41.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	13,945.14	3486.29	45.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	15,214.92	3803.73	50.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	16,668.15	4167.04	54.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	30,388.70	5469.97	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:51 PM	30,388.70	1519.43	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

DECEMBER 6

Analysis Hours: 8:10 AM-3:51 PM (PST)

JANUARY 4 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:10 AM	26,507.72	1060.31	87.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:15 AM	25,367.57	4312.49	83.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	22,456.40	5614.10	73.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	19,999.29	4999.82	65.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	17,629.50	4407.38	58.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	15,783.94	3945.98	51.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	13,911.74	3477.94	45.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	12,198.89	3049.72	40.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	10,474.46	2618.61	34.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	9,217.41	2304.35	30.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	8,086.19	2021.55	26.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	7,160.25	1790.06	23.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	6,298.23	1574.56	20.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	5,686.46	1421.62	18.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	5,517.64	1379.41	18.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	5,807.23	1451.81	19.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	6,092.62	1523.16	20.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	6,528.48	1632.12	21.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	6,915.76	1728.94	22.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	7,445.17	1861.29	24.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	7,956.57	1989.14	26.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	8,599.23	2149.81	28.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	9,172.57	2293.14	30.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	9,901.08	2475.27	32.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	10,542.75	2635.69	34.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	11,110.03	2777.51	36.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	11,784.26	2946.07	38.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	12,994.62	3248.65	42.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	14,328.37	3582.09	47.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	15,858.75	3964.69	52.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	21,176.05	5294.01	69.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	30,388.70	5166.08	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:51 PM	30,388.70	1519.43	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

DECEMBER 13

Analysis Hours: 8:15 AM-3:52 PM (PST)

DECEMBER 28 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:15 AM	26,833.69	3220.04	88.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	23,704.44	5926.11	78.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	21,056.58	5264.15	69.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	18,671.26	4667.82	61.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	16,722.91	4180.73	55.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	14,902.85	3725.71	49.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	13,181.71	3295.43	43.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	11,307.80	2826.95	37.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	9,865.45	2466.36	32.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	8,600.70	2150.17	28.3%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	7,617.20	1904.30	25.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	6,693.26	1673.32	22.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	5,998.78	1499.69	19.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	5,690.89	1422.72	18.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	5,951.02	1487.75	19.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	6,194.68	1548.67	20.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	6,639.69	1659.92	21.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	7,030.40	1757.60	23.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	7,556.44	1889.11	24.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	8,062.83	2015.71	26.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	8,705.52	2176.38	28.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	9,278.07	2319.52	30.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	10,000.83	2500.21	32.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	10,656.18	2664.04	35.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	11,242.82	2810.70	37.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	11,964.36	2991.09	39.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	13,142.50	3285.63	43.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	14,474.66	3618.67	47.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	16,137.74	4034.44	53.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	25,598.33	6399.58	84.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	30,388.70	5469.97	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:52 PM	30,388.70	1823.32	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

DECEMBER 20

Analysis Hours: 8:19 AM-3:54 PM (PST)

WINTER SOLSTICE
DECEMBER 21 SIMILAR

Analysis Time	CURRENT SHADOW			NEW SHADOW FROM CPHP			NOT USED		
	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage	Area (sf)	Area/Time (sfh)	Coverage
8:19 AM	26,945.21	2155.62	88.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:30 AM	24,622.78	5170.78	81.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
8:45 AM	21,843.69	5460.92	71.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:00 AM	19,415.89	4853.97	63.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:15 AM	17,332.12	4333.03	57.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:30 AM	15,515.87	3878.97	51.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
9:45 AM	13,832.84	3458.21	45.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:00 AM	11,906.80	2976.70	39.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:15 AM	10,357.84	2589.46	34.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:30 AM	8,985.43	2246.36	29.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
10:45 AM	7,946.87	1986.72	26.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:00 AM	6,966.48	1741.62	22.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:15 AM	6,228.30	1557.08	20.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:30 AM	5,779.23	1444.81	19.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
11:45 AM	5,982.77	1495.69	19.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:00 PM	6,193.11	1548.28	20.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:15 PM	6,626.37	1656.59	21.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:30 PM	7,011.16	1752.79	23.1%	0.00	0.00	0.0%	0.00	0.00	0.0%
12:45 PM	7,527.13	1881.78	24.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:00 PM	8,022.22	2005.55	26.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:15 PM	8,662.65	2165.66	28.5%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:30 PM	9,227.68	2306.92	30.4%	0.00	0.00	0.0%	0.00	0.00	0.0%
1:45 PM	9,937.52	2484.38	32.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:00 PM	10,610.24	2652.56	34.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:15 PM	11,220.41	2805.10	36.9%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:30 PM	11,923.11	2980.78	39.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
2:45 PM	13,024.82	3256.20	42.8%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:00 PM	14,334.88	3583.72	47.2%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:15 PM	16,027.70	4006.92	52.7%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:30 PM	20,842.95	5210.74	68.6%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:45 PM	30,388.70	6381.63	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%
3:54 PM	30,388.70	2431.10	100.0%	0.00	0.00	0.0%	0.00	0.00	0.0%

THEORETICAL ANNUAL AVAILABLE SUNLIGHT (TAAS)	GRATTAN ELEMENTARY
Area of Grattan Elementary	0.70 acres (30,398 sf)
Hours of annual available sunlight	3721.4 hrs
TAAS for Grattan Elementary	113,121,457 sfh

EXISTING (CURRENT) LEVELS OF SHADOW	GRATTAN ELEMENTARY
Existing annual total shading on park (sfh)	31,685,678 sfh
Existing shading as percentage of TAAS	28.01%

NEW SHADOW CAST BY THE PROPOSED UCSF PARNASSUS PROJECT	GRATTAN ELEMENTARY
Additional annual shading on Grattan Elementary from Project	72,263 sfh
Additional annual shading from Project as percentage of TAAS	0.06%
Combined total annual shading existing + Project (sfh)	31,757,941 sfh
Combined total annual shading from existing + Project as percentage of TAAS	28.07%
Number of days when new shading from Project would occur	56-68 days annually
Dates when new shadow from Project would be cast on Grattan Elementary	Between 3/23 - 4/25 & 8/17 - 9/19
Annual range in duration of new Project shadow (duration variance +/- 6 min.)	Zero to approx. 20 min
Range in area of new Project shadow (sf)	Zero to 11,866 sf
Average daily duration of new Project shadow (when present)	Approx. 15 min.
MAXIMUM NEW SHADING BY THE PROPOSED PROJECT	GRATTAN ELEMENTARY
Dates of maximum new shading from proposed Project (max sfh)	Apr 5 & Sep 6
Total new shading on date(s) of maximum shading (sfh)	1,661.22 sfh
Percentage new shadow on date(s) of maximum shading	0.51%
Date and duration of longest duration of new shading (duration variance +/- 6 min.)	Approx. 20 min on Aug 30 & Apr 12
Date and time of largest area of new Project shadow	11,866 sf on Sep 6/Apr 5 at 6:31 PM
Percentage of Grattan Elementary covered by largest new shadow	39.04%

THEORETICAL ANNUAL AVAILABLE SUNLIGHT (TAAS) CALCULATION	INDEPENDENCE HIGH SCHOOL
Total plan area of Independence High School	0.46 acres (20,211 sf)
Total hours of annual sunlight from 1-hr after sunrise through 1-hr before sunset	3721.4 hrs
Theoretical Annual Available Sunlight (plan area x hours of annual sunlight)	75,213,781 sfh

EXISTING SHADOW CONDITIONS SUMMARY	INDEPENDENCE HIGH SCHOOL
Total annual existing shadow load (existing shadow sfh ÷ TAAS sfh)	27.51%
Total annual existing shadow in square-foot-hours (sfh)	20,691,122 sfh
Range in existing shadow area coverage throughout the year	Between 0% - 100%
Time of year / time of day most affected by existing shadow	Fall / Early Morning (before 8:00 AM)

UCSF PARNASSUS NET NEW SHADOW SCENARIO SUMMARY	INDEPENDENCE HIGH SCHOOL
Annual net new project-only shadow load / Total existing + project shadow load	0.10% / 27.61%
Annual net new sfh project shadow / Total existing + project sfh	71,604 sfh / 20,762,727 sfh
Number of days annually when new shading from project would occur	Up to 152 days a year
Dates when net new shadow from project would be cast annually	2/9 - 4/25 & 8/17 - 10/31
Date(s) with most annual sfh net new project shadow (shadow load / net new sfh)	October 11 & March 1
Time of year / time of day most affected by project net new shadow overall	Winter / Early Morning (before 8:00 AM)
Date(s) with largest shadow area from the project (area and time shadow occurs)	Aug 30/Apr 12 (6,002 sf @ 7:37 AM)
Range in project net new shadow percentage coverage (area range)	Between 0% - 30% (0 - 6,002 sf)
Average project net new shadow coverage on affected dates (shadow area)	16.08% (3,251 sf)
Date(s) with the longest duration of net new shadow (duration)	Oct 4/Mar 8 (28 min +/- 7 min)
Range in daily project net new shadow duration (margin of error)	Between zero minutes up to 28 min (+/- 7 min)
Average daily project net new shadow duration on affected dates	15.2 minutes

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

JUNE 21

Summer solstice
Analysis hours: 6:46 AM-7:36 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
6:46 AM	13,854.20	1,523.96	68.7%	0.00	0.00	0.0%
7:00 AM	10,071.85	2,316.53	49.9%	0.00	0.00	0.0%
7:15 AM	6,795.22	1,698.81	33.7%	0.00	0.00	0.0%
7:30 AM	4,384.73	1,096.18	21.7%	0.00	0.00	0.0%
7:45 AM	2,556.56	639.14	12.7%	0.00	0.00	0.0%
8:00 AM	1,211.76	302.94	6.0%	0.00	0.00	0.0%
8:15 AM	593.85	148.46	2.9%	0.00	0.00	0.0%
8:30 AM	298.08	74.52	1.5%	0.00	0.00	0.0%
8:45 AM	133.40	33.35	0.7%	0.00	0.00	0.0%
9:00 AM	20.49	5.12	0.1%	0.00	0.00	0.0%
9:15 AM	57.36	14.34	0.3%	0.00	0.00	0.0%
9:30 AM	128.08	32.02	0.6%	0.00	0.00	0.0%
9:45 AM	189.15	47.29	0.9%	0.00	0.00	0.0%
10:00 AM	235.03	58.76	1.2%	0.00	0.00	0.0%
10:15 AM	276.99	69.25	1.4%	0.00	0.00	0.0%
10:30 AM	305.81	76.45	1.5%	0.00	0.00	0.0%
10:45 AM	334.96	83.74	1.7%	0.00	0.00	0.0%
11:00 AM	351.44	87.86	1.7%	0.00	0.00	0.0%
11:15 AM	371.89	92.97	1.8%	0.00	0.00	0.0%
11:30 AM	378.52	94.63	1.9%	0.00	0.00	0.0%
11:45 AM	392.83	98.21	1.9%	0.00	0.00	0.0%
12:00 PM	390.92	97.73	1.9%	0.00	0.00	0.0%
12:15 PM	401.09	100.27	2.0%	0.00	0.00	0.0%
12:30 PM	391.40	97.85	1.9%	0.00	0.00	0.0%
12:45 PM	397.33	99.33	2.0%	0.00	0.00	0.0%
1:00 PM	381.45	95.36	1.9%	0.00	0.00	0.0%
1:15 PM	388.68	97.17	1.9%	0.00	0.00	0.0%
1:30 PM	576.42	144.10	2.9%	0.00	0.00	0.0%
1:45 PM	789.05	197.26	3.9%	0.00	0.00	0.0%
2:00 PM	1,020.55	255.14	5.1%	0.00	0.00	0.0%
2:15 PM	1,417.86	354.47	7.0%	0.00	0.00	0.0%
2:30 PM	1,815.45	453.86	9.0%	0.00	0.00	0.0%
2:45 PM	2,232.32	558.08	11.1%	0.00	0.00	0.0%
3:00 PM	2,638.99	659.75	13.1%	0.00	0.00	0.0%
3:15 PM	3,070.13	767.53	15.2%	0.00	0.00	0.0%
3:30 PM	3,503.25	875.81	17.4%	0.00	0.00	0.0%
3:45 PM	3,965.98	991.49	19.7%	0.00	0.00	0.0%
4:00 PM	4,438.52	1,109.63	22.0%	0.00	0.00	0.0%
4:15 PM	4,946.85	1,236.71	24.5%	0.00	0.00	0.0%
4:30 PM	5,475.54	1,368.89	27.1%	0.00	0.00	0.0%
4:45 PM	6,195.16	1,548.79	30.7%	0.00	0.00	0.0%
5:00 PM	7,095.81	1,773.95	35.2%	0.00	0.00	0.0%
5:15 PM	8,112.87	2,028.22	40.2%	0.00	0.00	0.0%
5:30 PM	9,237.11	2,309.28	45.8%	0.00	0.00	0.0%
5:45 PM	10,273.13	2,568.28	50.9%	0.00	0.00	0.0%
6:00 PM	11,417.38	2,854.35	56.6%	0.00	0.00	0.0%
6:15 PM	12,688.70	3,172.18	62.9%	0.00	0.00	0.0%
6:30 PM	14,137.58	3,534.40	70.1%	0.00	0.00	0.0%
6:45 PM	15,730.06	3,932.52	78.0%	0.00	0.00	0.0%
7:00 PM	16,268.00	4,067.00	80.6%	0.00	0.00	0.0%
7:15 PM	15,992.24	4,797.67	79.3%	0.00	0.00	0.0%
7:36 PM	15,595.67	2,807.22	77.3%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

JUNE 28

Mirror date: June 14
Analysis hours: 6:48 AM-7:36 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
6:48 AM	13,845.17	1,384.52	68.6%	0.00	0.00	0.0%
7:00 AM	10,589.29	2,329.64	52.5%	0.00	0.00	0.0%
7:15 AM	7,183.31	1,795.83	35.6%	0.00	0.00	0.0%
7:30 AM	4,655.73	1,163.93	23.1%	0.00	0.00	0.0%
7:45 AM	2,771.25	692.81	13.7%	0.00	0.00	0.0%
8:00 AM	1,316.01	329.00	6.5%	0.00	0.00	0.0%
8:15 AM	636.03	159.01	3.2%	0.00	0.00	0.0%
8:30 AM	309.49	77.37	1.5%	0.00	0.00	0.0%
8:45 AM	138.93	34.73	0.7%	0.00	0.00	0.0%
9:00 AM	22.88	5.72	0.1%	0.00	0.00	0.0%
9:15 AM	56.41	14.10	0.3%	0.00	0.00	0.0%
9:30 AM	128.28	32.07	0.6%	0.00	0.00	0.0%
9:45 AM	190.28	47.57	0.9%	0.00	0.00	0.0%
10:00 AM	236.90	59.23	1.2%	0.00	0.00	0.0%
10:15 AM	279.38	69.84	1.4%	0.00	0.00	0.0%
10:30 AM	308.73	77.18	1.5%	0.00	0.00	0.0%
10:45 AM	338.25	84.56	1.7%	0.00	0.00	0.0%
11:00 AM	355.06	88.77	1.8%	0.00	0.00	0.0%
11:15 AM	375.69	93.92	1.9%	0.00	0.00	0.0%
11:30 AM	382.58	95.64	1.9%	0.00	0.00	0.0%
11:45 AM	397.19	99.30	2.0%	0.00	0.00	0.0%
12:00 PM	395.44	98.86	2.0%	0.00	0.00	0.0%
12:15 PM	405.67	101.42	2.0%	0.00	0.00	0.0%
12:30 PM	396.33	99.08	2.0%	0.00	0.00	0.0%
12:45 PM	402.22	100.56	2.0%	0.00	0.00	0.0%
1:00 PM	386.55	96.64	1.9%	0.00	0.00	0.0%
1:15 PM	392.03	98.01	1.9%	0.00	0.00	0.0%
1:30 PM	561.04	140.26	2.8%	0.00	0.00	0.0%
1:45 PM	774.33	193.58	3.8%	0.00	0.00	0.0%
2:00 PM	989.40	247.35	4.9%	0.00	0.00	0.0%
2:15 PM	1,387.22	346.80	6.9%	0.00	0.00	0.0%
2:30 PM	1,783.99	446.00	8.8%	0.00	0.00	0.0%
2:45 PM	2,200.59	550.15	10.9%	0.00	0.00	0.0%
3:00 PM	2,611.18	652.80	12.9%	0.00	0.00	0.0%
3:15 PM	3,042.60	760.65	15.1%	0.00	0.00	0.0%
3:30 PM	3,475.47	868.87	17.2%	0.00	0.00	0.0%
3:45 PM	3,938.17	984.54	19.5%	0.00	0.00	0.0%
4:00 PM	4,410.42	1,102.60	21.9%	0.00	0.00	0.0%
4:15 PM	4,918.46	1,229.61	24.4%	0.00	0.00	0.0%
4:30 PM	5,446.49	1,361.62	27.0%	0.00	0.00	0.0%
4:45 PM	6,122.10	1,530.53	30.3%	0.00	0.00	0.0%
5:00 PM	7,015.14	1,753.78	34.8%	0.00	0.00	0.0%
5:15 PM	8,023.17	2,005.79	39.8%	0.00	0.00	0.0%
5:30 PM	9,172.92	2,293.23	45.5%	0.00	0.00	0.0%
5:45 PM	10,206.41	2,551.60	50.6%	0.00	0.00	0.0%
6:00 PM	11,347.81	2,836.95	56.3%	0.00	0.00	0.0%
6:15 PM	12,616.42	3,154.10	62.5%	0.00	0.00	0.0%
6:30 PM	14,055.31	3,513.83	69.7%	0.00	0.00	0.0%
6:45 PM	15,681.33	3,920.33	77.7%	0.00	0.00	0.0%
7:00 PM	16,312.88	4,078.22	80.9%	0.00	0.00	0.0%
7:15 PM	16,036.17	4,810.85	79.5%	0.00	0.00	0.0%
7:36 PM	15,626.20	2,812.72	77.5%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

JULY 5

Mirror date: June 7
Analysis hours: 6:52 AM-7:36 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
6:52 AM	13,801.47	828.09	68.4%	0.00	0.00	0.0%
7:00 AM	11,403.71	2,166.70	56.5%	0.00	0.00	0.0%
7:15 AM	7,771.59	1,942.90	38.5%	0.00	0.00	0.0%
7:30 AM	5,051.50	1,262.88	25.0%	0.00	0.00	0.0%
7:45 AM	3,077.88	769.47	15.3%	0.00	0.00	0.0%
8:00 AM	1,497.23	374.31	7.4%	0.00	0.00	0.0%
8:15 AM	680.37	170.09	3.4%	0.00	0.00	0.0%
8:30 AM	301.22	75.30	1.5%	0.00	0.00	0.0%
8:45 AM	124.32	31.08	0.6%	0.00	0.00	0.0%
9:00 AM	18.16	4.54	0.1%	0.00	0.00	0.0%
9:15 AM	71.20	17.80	0.4%	0.00	0.00	0.0%
9:30 AM	143.95	35.99	0.7%	0.00	0.00	0.0%
9:45 AM	206.19	51.55	1.0%	0.00	0.00	0.0%
10:00 AM	252.80	63.20	1.3%	0.00	0.00	0.0%
10:15 AM	295.28	73.82	1.5%	0.00	0.00	0.0%
10:30 AM	324.51	81.13	1.6%	0.00	0.00	0.0%
10:45 AM	353.88	88.47	1.8%	0.00	0.00	0.0%
11:00 AM	370.53	92.63	1.8%	0.00	0.00	0.0%
11:15 AM	391.06	97.77	1.9%	0.00	0.00	0.0%
11:30 AM	397.75	99.44	2.0%	0.00	0.00	0.0%
11:45 AM	412.18	103.05	2.0%	0.00	0.00	0.0%
12:00 PM	410.39	102.60	2.0%	0.00	0.00	0.0%
12:15 PM	420.31	105.08	2.1%	0.00	0.00	0.0%
12:30 PM	411.00	102.75	2.0%	0.00	0.00	0.0%
12:45 PM	416.70	104.18	2.1%	0.00	0.00	0.0%
1:00 PM	401.22	100.31	2.0%	0.00	0.00	0.0%
1:15 PM	405.63	101.41	2.0%	0.00	0.00	0.0%
1:30 PM	559.83	139.96	2.8%	0.00	0.00	0.0%
1:45 PM	774.49	193.62	3.8%	0.00	0.00	0.0%
2:00 PM	980.06	245.02	4.9%	0.00	0.00	0.0%
2:15 PM	1,379.56	344.89	6.8%	0.00	0.00	0.0%
2:30 PM	1,776.78	444.19	8.8%	0.00	0.00	0.0%
2:45 PM	2,193.93	548.48	10.9%	0.00	0.00	0.0%
3:00 PM	2,618.11	654.53	13.0%	0.00	0.00	0.0%
3:15 PM	3,052.87	763.22	15.1%	0.00	0.00	0.0%
3:30 PM	3,489.33	872.33	17.3%	0.00	0.00	0.0%
3:45 PM	3,955.76	988.94	19.6%	0.00	0.00	0.0%
4:00 PM	4,432.10	1,108.03	22.0%	0.00	0.00	0.0%
4:15 PM	4,944.86	1,236.22	24.5%	0.00	0.00	0.0%
4:30 PM	5,477.94	1,369.49	27.2%	0.00	0.00	0.0%
4:45 PM	6,087.57	1,521.89	30.2%	0.00	0.00	0.0%
5:00 PM	6,976.39	1,744.10	34.6%	0.00	0.00	0.0%
5:15 PM	7,985.02	1,996.26	39.6%	0.00	0.00	0.0%
5:30 PM	9,148.45	2,287.11	45.3%	0.00	0.00	0.0%
5:45 PM	10,241.22	2,560.31	50.8%	0.00	0.00	0.0%
6:00 PM	11,398.93	2,849.73	56.5%	0.00	0.00	0.0%
6:15 PM	12,688.06	3,172.02	62.9%	0.00	0.00	0.0%
6:30 PM	14,158.84	3,539.71	70.2%	0.00	0.00	0.0%
6:45 PM	15,792.91	3,948.23	78.3%	0.00	0.00	0.0%
7:00 PM	16,392.39	4,098.10	81.3%	0.00	0.00	0.0%
7:15 PM	16,116.91	4,835.07	79.9%	0.00	0.00	0.0%
7:36 PM	15,721.01	2,829.78	77.9%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

JULY 12

Mirror date: May 31
Analysis hours: 6:56 AM-7:33 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
6:56 AM	13,715.81	411.47	68.0%	0.00	0.00	0.0%
7:00 AM	12,561.91	1,884.29	62.3%	0.00	0.00	0.0%
7:15 AM	8,592.05	2,148.01	42.6%	0.00	0.00	0.0%
7:30 AM	5,599.59	1,399.90	27.8%	0.00	0.00	0.0%
7:45 AM	3,487.26	871.82	17.3%	0.00	0.00	0.0%
8:00 AM	1,792.78	448.19	8.9%	0.00	0.00	0.0%
8:15 AM	753.81	188.45	3.7%	0.00	0.00	0.0%
8:30 AM	274.51	68.63	1.4%	0.00	0.00	0.0%
8:45 AM	89.26	22.31	0.4%	0.00	0.00	0.0%
9:00 AM	23.91	5.98	0.1%	0.00	0.00	0.0%
9:15 AM	103.55	25.89	0.5%	0.00	0.00	0.0%
9:30 AM	175.69	43.92	0.9%	0.00	0.00	0.0%
9:45 AM	237.49	59.37	1.2%	0.00	0.00	0.0%
10:00 AM	283.24	70.81	1.4%	0.00	0.00	0.0%
10:15 AM	325.10	81.27	1.6%	0.00	0.00	0.0%
10:30 AM	353.48	88.37	1.8%	0.00	0.00	0.0%
10:45 AM	382.24	95.56	1.9%	0.00	0.00	0.0%
11:00 AM	398.08	99.52	2.0%	0.00	0.00	0.0%
11:15 AM	418.04	104.51	2.1%	0.00	0.00	0.0%
11:30 AM	424.10	106.03	2.1%	0.00	0.00	0.0%
11:45 AM	437.98	109.49	2.2%	0.00	0.00	0.0%
12:00 PM	435.83	108.96	2.2%	0.00	0.00	0.0%
12:15 PM	445.14	111.28	2.2%	0.00	0.00	0.0%
12:30 PM	435.64	108.91	2.2%	0.00	0.00	0.0%
12:45 PM	440.73	110.18	2.2%	0.00	0.00	0.0%
1:00 PM	425.28	106.32	2.1%	0.00	0.00	0.0%
1:15 PM	428.58	107.14	2.1%	0.00	0.00	0.0%
1:30 PM	572.89	143.22	2.8%	0.00	0.00	0.0%
1:45 PM	790.10	197.52	3.9%	0.00	0.00	0.0%
2:00 PM	996.89	249.22	4.9%	0.00	0.00	0.0%
2:15 PM	1,394.95	348.74	6.9%	0.00	0.00	0.0%
2:30 PM	1,794.22	448.56	8.9%	0.00	0.00	0.0%
2:45 PM	2,213.65	553.41	11.0%	0.00	0.00	0.0%
3:00 PM	2,646.35	661.59	13.1%	0.00	0.00	0.0%
3:15 PM	3,101.33	775.33	15.4%	0.00	0.00	0.0%
3:30 PM	3,544.94	886.23	17.6%	0.00	0.00	0.0%
3:45 PM	4,019.49	1,004.87	19.9%	0.00	0.00	0.0%
4:00 PM	4,504.51	1,126.13	22.3%	0.00	0.00	0.0%
4:15 PM	5,027.56	1,256.89	24.9%	0.00	0.00	0.0%
4:30 PM	5,571.56	1,392.89	27.6%	0.00	0.00	0.0%
4:45 PM	6,163.73	1,540.93	30.6%	0.00	0.00	0.0%
5:00 PM	6,981.38	1,745.34	34.6%	0.00	0.00	0.0%
5:15 PM	7,999.60	1,999.90	39.7%	0.00	0.00	0.0%
5:30 PM	9,177.50	2,294.38	45.5%	0.00	0.00	0.0%
5:45 PM	10,380.34	2,595.09	51.5%	0.00	0.00	0.0%
6:00 PM	11,573.68	2,893.42	57.4%	0.00	0.00	0.0%
6:15 PM	12,908.68	3,227.17	64.0%	0.00	0.00	0.0%
6:30 PM	14,459.43	3,614.86	71.7%	0.00	0.00	0.0%
6:45 PM	16,065.60	4,016.40	79.6%	0.00	0.00	0.0%
7:00 PM	16,504.07	4,126.02	81.8%	0.00	0.00	0.0%
7:15 PM	16,227.39	4,543.67	80.4%	0.00	0.00	0.0%
7:33 PM	15,876.16	2,381.42	78.7%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

JULY 19

Mirror date: May 24
Analysis hours: 7:01 AM-7:30 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:01 AM	13,660.73	1,775.89	67.7%	0.00	0.00	0.0%
7:16 AM	9,347.08	2,243.30	46.3%	0.00	0.00	0.0%
7:30 AM	6,326.86	1,518.45	31.4%	0.00	0.00	0.0%
7:45 AM	3,986.65	996.66	19.8%	0.00	0.00	0.0%
8:00 AM	2,175.99	544.00	10.8%	0.00	0.00	0.0%
8:15 AM	861.08	215.27	4.3%	0.00	0.00	0.0%
8:30 AM	246.19	61.55	1.2%	0.00	0.00	0.0%
8:45 AM	36.16	9.04	0.2%	0.00	0.00	0.0%
9:00 AM	62.64	15.66	0.3%	0.00	0.00	0.0%
9:15 AM	155.17	38.79	0.8%	0.00	0.00	0.0%
9:30 AM	225.32	56.33	1.1%	0.00	0.00	0.0%
9:45 AM	285.34	71.34	1.4%	0.00	0.00	0.0%
10:00 AM	329.22	82.30	1.6%	0.00	0.00	0.0%
10:15 AM	369.62	92.40	1.8%	0.00	0.00	0.0%
10:30 AM	396.15	99.04	2.0%	0.00	0.00	0.0%
10:45 AM	423.69	105.92	2.1%	0.00	0.00	0.0%
11:00 AM	438.07	109.52	2.2%	0.00	0.00	0.0%
11:15 AM	457.00	114.25	2.3%	0.00	0.00	0.0%
11:30 AM	461.95	115.49	2.3%	0.00	0.00	0.0%
11:45 AM	474.85	118.71	2.4%	0.00	0.00	0.0%
12:00 PM	471.82	117.95	2.3%	0.00	0.00	0.0%
12:15 PM	480.11	120.03	2.4%	0.00	0.00	0.0%
12:30 PM	470.18	117.55	2.3%	0.00	0.00	0.0%
12:45 PM	474.22	118.55	2.4%	0.00	0.00	0.0%
1:00 PM	458.63	114.66	2.3%	0.00	0.00	0.0%
1:15 PM	461.02	115.26	2.3%	0.00	0.00	0.0%
1:30 PM	603.28	150.82	3.0%	0.00	0.00	0.0%
1:45 PM	823.93	205.98	4.1%	0.00	0.00	0.0%
2:00 PM	1,034.55	258.64	5.1%	0.00	0.00	0.0%
2:15 PM	1,439.38	359.84	7.1%	0.00	0.00	0.0%
2:30 PM	1,842.17	460.54	9.1%	0.00	0.00	0.0%
2:45 PM	2,265.49	566.37	11.2%	0.00	0.00	0.0%
3:00 PM	2,702.98	675.74	13.4%	0.00	0.00	0.0%
3:15 PM	3,167.69	791.92	15.7%	0.00	0.00	0.0%
3:30 PM	3,649.31	912.33	18.1%	0.00	0.00	0.0%
3:45 PM	4,136.87	1,034.22	20.5%	0.00	0.00	0.0%
4:00 PM	4,635.28	1,158.82	23.0%	0.00	0.00	0.0%
4:15 PM	5,174.66	1,293.66	25.7%	0.00	0.00	0.0%
4:30 PM	5,736.24	1,434.06	28.4%	0.00	0.00	0.0%
4:45 PM	6,350.19	1,587.55	31.5%	0.00	0.00	0.0%
5:00 PM	7,045.06	1,761.27	34.9%	0.00	0.00	0.0%
5:15 PM	8,081.30	2,020.32	40.1%	0.00	0.00	0.0%
5:30 PM	9,289.33	2,322.33	46.0%	0.00	0.00	0.0%
5:45 PM	10,644.12	2,661.03	52.8%	0.00	0.00	0.0%
6:00 PM	11,898.10	2,974.53	59.0%	0.00	0.00	0.0%
6:15 PM	13,313.04	3,328.26	66.0%	0.00	0.00	0.0%
6:30 PM	14,999.33	3,749.83	74.4%	0.00	0.00	0.0%
6:45 PM	16,541.82	4,135.45	82.0%	0.00	0.00	0.0%
7:00 PM	16,641.29	4,160.32	82.5%	0.00	0.00	0.0%
7:15 PM	16,366.22	4,091.55	81.1%	0.00	0.00	0.0%
7:30 PM	16,083.61	2,090.87	79.7%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

JULY 26

Mirror date: May 17
Analysis hours: 7:07 AM-7:25 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:07 AM	13,613.87	816.83	67.5%	0.00	0.00	0.0%
7:15 AM	11,134.84	2,115.62	55.2%	0.00	0.00	0.0%
7:30 AM	7,277.11	1,819.28	36.1%	0.00	0.00	0.0%
7:45 AM	4,611.24	1,152.81	22.9%	0.00	0.00	0.0%
8:00 AM	2,646.73	661.68	13.1%	0.00	0.00	0.0%
8:15 AM	1,039.03	259.76	5.2%	0.00	0.00	0.0%
8:30 AM	241.89	60.47	1.2%	0.00	0.00	0.0%
8:45 AM	39.44	9.86	0.2%	0.00	0.00	0.0%
9:00 AM	136.92	34.23	0.7%	0.00	0.00	0.0%
9:15 AM	226.58	56.65	1.1%	0.00	0.00	0.0%
9:30 AM	293.19	73.30	1.5%	0.00	0.00	0.0%
9:45 AM	350.40	87.60	1.7%	0.00	0.00	0.0%
10:00 AM	391.04	97.76	1.9%	0.00	0.00	0.0%
10:15 AM	428.92	107.23	2.1%	0.00	0.00	0.0%
10:30 AM	452.93	113.23	2.2%	0.00	0.00	0.0%
10:45 AM	478.47	119.62	2.4%	0.00	0.00	0.0%
11:00 AM	490.60	122.65	2.4%	0.00	0.00	0.0%
11:15 AM	507.98	126.99	2.5%	0.00	0.00	0.0%
11:30 AM	511.10	127.77	2.5%	0.00	0.00	0.0%
11:45 AM	522.61	130.65	2.6%	0.00	0.00	0.0%
12:00 PM	518.24	129.56	2.6%	0.00	0.00	0.0%
12:15 PM	525.26	131.32	2.6%	0.00	0.00	0.0%
12:30 PM	514.48	128.62	2.6%	0.00	0.00	0.0%
12:45 PM	517.33	129.33	2.6%	0.00	0.00	0.0%
1:00 PM	501.33	125.33	2.5%	0.00	0.00	0.0%
1:15 PM	502.81	125.70	2.5%	0.00	0.00	0.0%
1:30 PM	649.55	162.39	3.2%	0.00	0.00	0.0%
1:45 PM	874.78	218.70	4.3%	0.00	0.00	0.0%
2:00 PM	1,099.33	274.83	5.4%	0.00	0.00	0.0%
2:15 PM	1,509.75	377.44	7.5%	0.00	0.00	0.0%
2:30 PM	1,917.19	479.30	9.5%	0.00	0.00	0.0%
2:45 PM	2,346.11	586.53	11.6%	0.00	0.00	0.0%
3:00 PM	2,790.31	697.58	13.8%	0.00	0.00	0.0%
3:15 PM	3,262.50	815.63	16.2%	0.00	0.00	0.0%
3:30 PM	3,758.42	939.61	18.6%	0.00	0.00	0.0%
3:45 PM	4,294.44	1,073.61	21.3%	0.00	0.00	0.0%
4:00 PM	4,823.11	1,205.78	23.9%	0.00	0.00	0.0%
4:15 PM	5,384.76	1,346.19	26.7%	0.00	0.00	0.0%
4:30 PM	5,971.28	1,492.82	29.6%	0.00	0.00	0.0%
4:45 PM	6,615.30	1,653.82	32.8%	0.00	0.00	0.0%
5:00 PM	7,305.09	1,826.27	36.2%	0.00	0.00	0.0%
5:15 PM	8,225.22	2,056.31	40.8%	0.00	0.00	0.0%
5:30 PM	9,477.31	2,369.33	47.0%	0.00	0.00	0.0%
5:45 PM	10,945.13	2,736.28	54.3%	0.00	0.00	0.0%
6:00 PM	12,378.79	3,094.70	61.4%	0.00	0.00	0.0%
6:15 PM	13,913.85	3,478.46	69.0%	0.00	0.00	0.0%
6:30 PM	15,801.22	3,950.30	78.3%	0.00	0.00	0.0%
6:45 PM	17,039.57	4,259.89	84.5%	0.00	0.00	0.0%
7:00 PM	16,802.65	4,200.66	83.3%	0.00	0.00	0.0%
7:15 PM	16,530.54	3,471.41	81.9%	0.00	0.00	0.0%
7:25 PM	16,341.68	1,470.75	81.0%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

AUGUST 2

Mirror date: May 10
Analysis hours: 7:12 AM-7:18 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:12 AM	13,593.18	271.86	67.4%	0.00	0.00	0.0%
7:15 AM	12,784.64	1,917.70	63.4%	0.00	0.00	0.0%
7:30 AM	8,467.35	2,116.84	42.0%	0.00	0.00	0.0%
7:45 AM	5,371.22	1,342.81	26.6%	0.00	0.00	0.0%
8:00 AM	3,167.42	791.86	15.7%	0.00	0.00	0.0%
8:15 AM	1,376.83	344.21	6.8%	0.00	0.00	0.0%
8:30 AM	331.32	82.83	1.6%	0.00	0.00	0.0%
8:45 AM	151.72	37.93	0.8%	0.00	0.00	0.0%
9:00 AM	237.44	59.36	1.2%	0.00	0.00	0.0%
9:15 AM	320.60	80.15	1.6%	0.00	0.00	0.0%
9:30 AM	381.54	95.39	1.9%	0.00	0.00	0.0%
9:45 AM	434.04	108.51	2.2%	0.00	0.00	0.0%
10:00 AM	470.03	117.51	2.3%	0.00	0.00	0.0%
10:15 AM	504.10	126.02	2.5%	0.00	0.00	0.0%
10:30 AM	524.28	131.07	2.6%	0.00	0.00	0.0%
10:45 AM	546.93	136.73	2.7%	0.00	0.00	0.0%
11:00 AM	556.06	139.01	2.8%	0.00	0.00	0.0%
11:15 AM	571.09	142.77	2.8%	0.00	0.00	0.0%
11:30 AM	571.81	142.95	2.8%	0.00	0.00	0.0%
11:45 AM	581.45	145.36	2.9%	0.00	0.00	0.0%
12:00 PM	575.22	143.81	2.9%	0.00	0.00	0.0%
12:15 PM	580.53	145.13	2.9%	0.00	0.00	0.0%
12:30 PM	568.59	142.15	2.8%	0.00	0.00	0.0%
12:45 PM	569.69	142.42	2.8%	0.00	0.00	0.0%
1:00 PM	553.01	138.25	2.7%	0.00	0.00	0.0%
1:15 PM	554.08	138.52	2.7%	0.00	0.00	0.0%
1:30 PM	715.74	178.94	3.5%	0.00	0.00	0.0%
1:45 PM	946.71	236.68	4.7%	0.00	0.00	0.0%
2:00 PM	1,196.83	299.21	5.9%	0.00	0.00	0.0%
2:15 PM	1,612.38	403.09	8.0%	0.00	0.00	0.0%
2:30 PM	2,026.18	506.55	10.0%	0.00	0.00	0.0%
2:45 PM	2,462.98	615.74	12.2%	0.00	0.00	0.0%
3:00 PM	2,915.98	728.99	14.5%	0.00	0.00	0.0%
3:15 PM	3,398.77	849.69	16.8%	0.00	0.00	0.0%
3:30 PM	3,906.94	976.74	19.4%	0.00	0.00	0.0%
3:45 PM	4,457.54	1,114.39	22.1%	0.00	0.00	0.0%
4:00 PM	5,049.36	1,262.34	25.0%	0.00	0.00	0.0%
4:15 PM	5,672.60	1,418.15	28.1%	0.00	0.00	0.0%
4:30 PM	6,292.29	1,573.07	31.2%	0.00	0.00	0.0%
4:45 PM	6,977.81	1,744.45	34.6%	0.00	0.00	0.0%
5:00 PM	7,714.33	1,928.58	38.2%	0.00	0.00	0.0%
5:15 PM	8,539.67	2,134.92	42.3%	0.00	0.00	0.0%
5:30 PM	9,769.48	2,442.37	48.4%	0.00	0.00	0.0%
5:45 PM	11,327.74	2,831.93	56.2%	0.00	0.00	0.0%
6:00 PM	13,069.74	3,267.43	64.8%	0.00	0.00	0.0%
6:15 PM	14,807.39	3,701.85	73.4%	0.00	0.00	0.0%
6:30 PM	16,732.30	4,183.07	82.9%	0.00	0.00	0.0%
6:45 PM	17,244.08	4,311.02	85.5%	0.00	0.00	0.0%
7:00 PM	16,979.25	4,244.81	84.2%	0.00	0.00	0.0%
7:15 PM	16,706.17	2,505.93	82.8%	0.00	0.00	0.0%
7:18 PM	16,639.71	499.19	82.5%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

AUGUST 9

Mirror date: May 3
Analysis hours: 7:19 AM-7:10 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:19 AM	13,535.11	1,218.16	67.1%	0.00	0.00	0.0%
7:30 AM	10,006.74	2,101.41	49.6%	0.00	0.00	0.0%
7:45 AM	6,381.35	1,595.34	31.6%	0.00	0.00	0.0%
8:00 AM	3,781.42	945.36	18.7%	0.00	0.00	0.0%
8:15 AM	1,834.55	458.64	9.1%	0.00	0.00	0.0%
8:30 AM	726.26	181.56	3.6%	0.00	0.00	0.0%
8:45 AM	360.08	90.02	1.8%	0.00	0.00	0.0%
9:00 AM	367.79	91.95	1.8%	0.00	0.00	0.0%
9:15 AM	438.27	109.57	2.2%	0.00	0.00	0.0%
9:30 AM	490.98	122.74	2.4%	0.00	0.00	0.0%
9:45 AM	536.76	134.19	2.7%	0.00	0.00	0.0%
10:00 AM	566.26	141.56	2.8%	0.00	0.00	0.0%
10:15 AM	595.31	148.83	3.0%	0.00	0.00	0.0%
10:30 AM	610.45	152.61	3.0%	0.00	0.00	0.0%
10:45 AM	629.21	157.30	3.1%	0.00	0.00	0.0%
11:00 AM	634.39	158.60	3.1%	0.00	0.00	0.0%
11:15 AM	646.37	161.59	3.2%	0.00	0.00	0.0%
11:30 AM	643.94	160.98	3.2%	0.00	0.00	0.0%
11:45 AM	651.07	162.77	3.2%	0.00	0.00	0.0%
12:00 PM	642.61	160.65	3.2%	0.00	0.00	0.0%
12:15 PM	645.69	161.42	3.2%	0.00	0.00	0.0%
12:30 PM	632.10	158.03	3.1%	0.00	0.00	0.0%
12:45 PM	631.41	157.85	3.1%	0.00	0.00	0.0%
1:00 PM	613.74	153.44	3.0%	0.00	0.00	0.0%
1:15 PM	615.08	153.77	3.0%	0.00	0.00	0.0%
1:30 PM	800.33	200.08	4.0%	0.00	0.00	0.0%
1:45 PM	1,038.31	259.58	5.1%	0.00	0.00	0.0%
2:00 PM	1,322.92	330.73	6.6%	0.00	0.00	0.0%
2:15 PM	1,743.92	435.98	8.6%	0.00	0.00	0.0%
2:30 PM	2,165.65	541.41	10.7%	0.00	0.00	0.0%
2:45 PM	2,612.26	653.07	12.9%	0.00	0.00	0.0%
3:00 PM	3,076.32	769.08	15.2%	0.00	0.00	0.0%
3:15 PM	3,572.06	893.02	17.7%	0.00	0.00	0.0%
3:30 PM	4,095.64	1,023.91	20.3%	0.00	0.00	0.0%
3:45 PM	4,664.83	1,166.21	23.1%	0.00	0.00	0.0%
4:00 PM	5,278.80	1,319.70	26.2%	0.00	0.00	0.0%
4:15 PM	5,959.03	1,489.76	29.5%	0.00	0.00	0.0%
4:30 PM	6,702.58	1,675.65	33.2%	0.00	0.00	0.0%
4:45 PM	7,441.88	1,860.47	36.9%	0.00	0.00	0.0%
5:00 PM	8,240.49	2,060.12	40.8%	0.00	0.00	0.0%
5:15 PM	9,143.15	2,285.79	45.3%	0.00	0.00	0.0%
5:30 PM	10,182.15	2,545.54	50.5%	0.00	0.00	0.0%
5:45 PM	11,843.72	2,960.93	58.7%	0.00	0.00	0.0%
6:00 PM	13,916.47	3,479.12	69.0%	0.00	0.00	0.0%
6:15 PM	16,087.33	4,021.83	79.7%	0.00	0.00	0.0%
6:30 PM	17,670.67	4,417.67	87.6%	0.00	0.00	0.0%
6:45 PM	17,433.45	5,927.37	86.4%	0.00	0.00	0.0%
7:10 PM	16,970.40	3,563.78	84.1%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

AUGUST 16

Mirror date: April 26
Analysis hours: 7:25 AM-7:02 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:25 AM	13,635.40	545.42	67.6%	0.00	0.00	0.0%
7:30 AM	12,031.06	2,045.28	59.6%	0.00	0.00	0.0%
7:45 AM	7,669.76	1,917.44	38.0%	0.00	0.00	0.0%
8:00 AM	4,569.39	1,142.35	22.7%	0.00	0.00	0.0%
8:15 AM	2,725.10	681.27	13.5%	0.00	0.00	0.0%
8:30 AM	1,367.26	341.81	6.8%	0.00	0.00	0.0%
8:45 AM	697.53	174.38	3.5%	0.00	0.00	0.0%
9:00 AM	534.64	133.66	2.7%	0.00	0.00	0.0%
9:15 AM	581.13	145.28	2.9%	0.00	0.00	0.0%
9:30 AM	622.53	155.63	3.1%	0.00	0.00	0.0%
9:45 AM	659.23	164.81	3.3%	0.00	0.00	0.0%
10:00 AM	680.34	170.09	3.4%	0.00	0.00	0.0%
10:15 AM	702.85	175.71	3.5%	0.00	0.00	0.0%
10:30 AM	711.48	177.87	3.5%	0.00	0.00	0.0%
10:45 AM	725.35	181.34	3.6%	0.00	0.00	0.0%
11:00 AM	725.65	181.41	3.6%	0.00	0.00	0.0%
11:15 AM	733.76	183.44	3.6%	0.00	0.00	0.0%
11:30 AM	727.63	181.91	3.6%	0.00	0.00	0.0%
11:45 AM	731.79	182.95	3.6%	0.00	0.00	0.0%
12:00 PM	720.44	180.11	3.6%	0.00	0.00	0.0%
12:15 PM	720.92	180.23	3.6%	0.00	0.00	0.0%
12:30 PM	705.32	176.33	3.5%	0.00	0.00	0.0%
12:45 PM	702.56	175.64	3.5%	0.00	0.00	0.0%
1:00 PM	683.40	170.85	3.4%	0.00	0.00	0.0%
1:15 PM	688.03	172.01	3.4%	0.00	0.00	0.0%
1:30 PM	902.42	225.61	4.5%	0.00	0.00	0.0%
1:45 PM	1,148.65	287.16	5.7%	0.00	0.00	0.0%
2:00 PM	1,474.75	368.69	7.3%	0.00	0.00	0.0%
2:15 PM	1,901.19	475.30	9.4%	0.00	0.00	0.0%
2:30 PM	2,332.46	583.11	11.6%	0.00	0.00	0.0%
2:45 PM	2,790.48	697.62	13.8%	0.00	0.00	0.0%
3:00 PM	3,267.72	816.93	16.2%	0.00	0.00	0.0%
3:15 PM	3,779.09	944.77	18.7%	0.00	0.00	0.0%
3:30 PM	4,321.20	1,080.30	21.4%	0.00	0.00	0.0%
3:45 PM	4,912.49	1,228.12	24.4%	0.00	0.00	0.0%
4:00 PM	5,553.30	1,388.32	27.5%	0.00	0.00	0.0%
4:15 PM	6,266.62	1,566.65	31.1%	0.00	0.00	0.0%
4:30 PM	7,059.77	1,764.94	35.0%	0.00	0.00	0.0%
4:45 PM	7,967.06	1,991.77	39.5%	0.00	0.00	0.0%
5:00 PM	8,895.99	2,224.00	44.1%	0.00	0.00	0.0%
5:15 PM	9,900.66	2,475.16	49.1%	0.00	0.00	0.0%
5:30 PM	11,028.38	2,757.09	54.7%	0.00	0.00	0.0%
5:45 PM	12,511.16	3,127.79	62.0%	0.00	0.00	0.0%
6:00 PM	14,854.22	3,713.56	73.6%	0.00	0.00	0.0%
6:15 PM	17,488.30	4,372.07	86.7%	0.00	0.00	0.0%
6:30 PM	17,983.17	4,495.79	89.1%	0.00	0.00	0.0%
6:45 PM	17,637.65	4,762.17	87.4%	0.00	0.00	0.0%
7:02 PM	17,327.19	2,425.81	85.9%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

AUGUST 23

Mirror date: April 19
Analysis hours: 7:31 AM-6:52 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:31 AM	13,852.44	1,523.77	68.7%	1,020.42	112.25	5.1%
7:45 AM	9,287.18	2,136.05	46.0%	0.00	0.00	0.0%
8:00 AM	5,937.60	1,484.40	29.4%	0.00	0.00	0.0%
8:15 AM	3,864.09	966.02	19.2%	0.00	0.00	0.0%
8:30 AM	2,238.06	559.51	11.1%	0.00	0.00	0.0%
8:45 AM	1,202.26	300.56	6.0%	0.00	0.00	0.0%
9:00 AM	770.07	192.52	3.8%	0.00	0.00	0.0%
9:15 AM	754.12	188.53	3.7%	0.00	0.00	0.0%
9:30 AM	778.29	194.57	3.9%	0.00	0.00	0.0%
9:45 AM	803.24	200.81	4.0%	0.00	0.00	0.0%
10:00 AM	813.44	203.36	4.0%	0.00	0.00	0.0%
10:15 AM	827.51	206.88	4.1%	0.00	0.00	0.0%
10:30 AM	828.10	207.03	4.1%	0.00	0.00	0.0%
10:45 AM	835.59	208.90	4.1%	0.00	0.00	0.0%
11:00 AM	829.67	207.42	4.1%	0.00	0.00	0.0%
11:15 AM	832.78	208.19	4.1%	0.00	0.00	0.0%
11:30 AM	822.06	205.51	4.1%	0.00	0.00	0.0%
11:45 AM	822.22	205.56	4.1%	0.00	0.00	0.0%
12:00 PM	807.60	201.90	4.0%	0.00	0.00	0.0%
12:15 PM	805.03	201.26	4.0%	0.00	0.00	0.0%
12:30 PM	787.24	196.81	3.9%	0.00	0.00	0.0%
12:45 PM	781.83	195.46	3.9%	0.00	0.00	0.0%
1:00 PM	761.22	190.30	3.8%	0.00	0.00	0.0%
1:15 PM	797.71	199.43	4.0%	0.00	0.00	0.0%
1:30 PM	1,027.55	256.89	5.1%	0.00	0.00	0.0%
1:45 PM	1,283.49	320.87	6.4%	0.00	0.00	0.0%
2:00 PM	1,662.24	415.56	8.2%	0.00	0.00	0.0%
2:15 PM	2,093.10	523.28	10.4%	0.00	0.00	0.0%
2:30 PM	2,536.05	634.01	12.6%	0.00	0.00	0.0%
2:45 PM	3,007.98	751.99	14.9%	0.00	0.00	0.0%
3:00 PM	3,500.91	875.23	17.4%	0.00	0.00	0.0%
3:15 PM	4,031.47	1,007.87	20.0%	0.00	0.00	0.0%
3:30 PM	4,595.90	1,148.98	22.8%	0.00	0.00	0.0%
3:45 PM	5,215.40	1,303.85	25.9%	0.00	0.00	0.0%
4:00 PM	5,888.88	1,472.22	29.2%	0.00	0.00	0.0%
4:15 PM	6,643.73	1,660.93	32.9%	0.00	0.00	0.0%
4:30 PM	7,488.33	1,872.08	37.1%	0.00	0.00	0.0%
4:45 PM	8,461.83	2,115.46	41.9%	0.00	0.00	0.0%
5:00 PM	9,589.40	2,397.35	47.5%	0.00	0.00	0.0%
5:15 PM	10,870.37	2,717.59	53.9%	0.00	0.00	0.0%
5:30 PM	12,165.49	3,041.37	60.3%	0.00	0.00	0.0%
5:45 PM	13,748.78	3,437.19	68.2%	0.00	0.00	0.0%
6:00 PM	16,252.42	4,063.11	80.6%	0.00	0.00	0.0%
6:15 PM	18,262.68	4,565.67	90.5%	0.00	0.00	0.0%
6:30 PM	18,609.46	4,652.36	92.2%	0.00	0.00	0.0%
6:45 PM	18,100.13	3,439.02	89.7%	0.00	0.00	0.0%
6:52 PM	17,719.28	1,063.16	87.8%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

AUGUST 30

Mirror date: April 12
Analysis hours: 7:37 AM-6:42 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:37 AM	14,170.92	850.26	70.2%	6,002.20	360.13	29.8%
7:45 AM	11,643.53	2,212.27	57.7%	1,491.19	283.33	7.4%
8:00 AM	7,731.77	1,932.94	38.3%	0.00	0.00	0.0%
8:15 AM	5,167.05	1,291.76	25.6%	0.00	0.00	0.0%
8:30 AM	3,320.76	830.19	16.5%	0.00	0.00	0.0%
8:45 AM	1,886.81	471.70	9.4%	0.00	0.00	0.0%
9:00 AM	1,145.76	286.44	5.7%	0.00	0.00	0.0%
9:15 AM	965.99	241.50	4.8%	0.00	0.00	0.0%
9:30 AM	959.23	239.81	4.8%	0.00	0.00	0.0%
9:45 AM	968.57	242.14	4.8%	0.00	0.00	0.0%
10:00 AM	964.70	241.18	4.8%	0.00	0.00	0.0%
10:15 AM	967.81	241.95	4.8%	0.00	0.00	0.0%
10:30 AM	958.42	239.61	4.8%	0.00	0.00	0.0%
10:45 AM	958.13	239.53	4.7%	0.00	0.00	0.0%
11:00 AM	945.09	236.27	4.7%	0.00	0.00	0.0%
11:15 AM	942.51	235.63	4.7%	0.00	0.00	0.0%
11:30 AM	926.67	231.67	4.6%	0.00	0.00	0.0%
11:45 AM	922.53	230.63	4.6%	0.00	0.00	0.0%
12:00 PM	904.29	226.07	4.5%	0.00	0.00	0.0%
12:15 PM	898.35	224.59	4.5%	0.00	0.00	0.0%
12:30 PM	877.89	219.47	4.4%	0.00	0.00	0.0%
12:45 PM	869.96	217.49	4.3%	0.00	0.00	0.0%
1:00 PM	847.37	211.84	4.2%	0.00	0.00	0.0%
1:15 PM	926.64	231.66	4.6%	0.00	0.00	0.0%
1:30 PM	1,170.92	292.73	5.8%	0.00	0.00	0.0%
1:45 PM	1,438.04	359.51	7.1%	0.00	0.00	0.0%
2:00 PM	1,868.63	467.16	9.3%	0.00	0.00	0.0%
2:15 PM	2,309.03	577.26	11.4%	0.00	0.00	0.0%
2:30 PM	2,765.28	691.32	13.7%	0.00	0.00	0.0%
2:45 PM	3,253.07	813.27	16.1%	0.00	0.00	0.0%
3:00 PM	3,764.00	941.00	18.7%	0.00	0.00	0.0%
3:15 PM	4,316.96	1,079.24	21.4%	0.00	0.00	0.0%
3:30 PM	4,907.26	1,226.82	24.3%	0.00	0.00	0.0%
3:45 PM	5,558.51	1,389.63	27.6%	0.00	0.00	0.0%
4:00 PM	6,271.18	1,567.80	31.1%	0.00	0.00	0.0%
4:15 PM	7,074.90	1,768.72	35.1%	0.00	0.00	0.0%
4:30 PM	7,980.98	1,995.24	39.6%	0.00	0.00	0.0%
4:45 PM	9,033.88	2,258.47	44.8%	0.00	0.00	0.0%
5:00 PM	10,266.08	2,566.52	50.9%	0.00	0.00	0.0%
5:15 PM	11,759.25	2,939.81	58.3%	0.00	0.00	0.0%
5:30 PM	13,629.35	3,407.34	67.6%	0.00	0.00	0.0%
5:45 PM	15,705.72	3,926.43	77.9%	0.00	0.00	0.0%
6:00 PM	17,579.28	4,394.82	87.1%	0.00	0.00	0.0%
6:15 PM	17,856.39	4,464.10	88.5%	0.00	0.00	0.0%
6:30 PM	19,138.31	4,401.81	94.9%	0.00	0.00	0.0%
6:42 PM	19,395.07	2,133.46	96.1%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

SEPTEMBER 6

Mirror date: April 5
Analysis hours: 7:44 AM-6:31 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:44 AM	16,296.06	2,118.49	80.8%	3,877.06	504.02	19.2%
8:00 AM	9,844.72	2,461.18	48.8%	0.00	0.00	0.0%
8:15 AM	6,712.95	1,678.24	33.3%	0.00	0.00	0.0%
8:30 AM	4,595.19	1,148.80	22.8%	0.00	0.00	0.0%
8:45 AM	2,797.02	699.26	13.9%	0.00	0.00	0.0%
9:00 AM	1,660.94	415.24	8.2%	0.00	0.00	0.0%
9:15 AM	1,219.34	304.84	6.0%	0.00	0.00	0.0%
9:30 AM	1,163.02	290.76	5.8%	0.00	0.00	0.0%
9:45 AM	1,152.13	288.03	5.7%	0.00	0.00	0.0%
10:00 AM	1,131.85	282.96	5.6%	0.00	0.00	0.0%
10:15 AM	1,122.16	280.54	5.6%	0.00	0.00	0.0%
10:30 AM	1,101.65	275.41	5.5%	0.00	0.00	0.0%
10:45 AM	1,092.43	273.11	5.4%	0.00	0.00	0.0%
11:00 AM	1,071.52	267.88	5.3%	0.00	0.00	0.0%
11:15 AM	1,062.65	265.66	5.3%	0.00	0.00	0.0%
11:30 AM	1,041.12	260.28	5.2%	0.00	0.00	0.0%
11:45 AM	1,032.25	258.06	5.1%	0.00	0.00	0.0%
12:00 PM	1,010.09	252.52	5.0%	0.00	0.00	0.0%
12:15 PM	1,000.73	250.18	5.0%	0.00	0.00	0.0%
12:30 PM	977.41	244.35	4.8%	0.00	0.00	0.0%
12:45 PM	966.60	241.65	4.8%	0.00	0.00	0.0%
1:00 PM	942.15	235.54	4.7%	0.00	0.00	0.0%
1:15 PM	1,074.68	268.67	5.3%	0.00	0.00	0.0%
1:30 PM	1,333.16	333.29	6.6%	0.00	0.00	0.0%
1:45 PM	1,655.42	413.86	8.2%	0.00	0.00	0.0%
2:00 PM	2,094.86	523.72	10.4%	0.00	0.00	0.0%
2:15 PM	2,548.83	637.21	12.6%	0.00	0.00	0.0%
2:30 PM	3,019.60	754.90	15.0%	0.00	0.00	0.0%
2:45 PM	3,525.25	881.31	17.5%	0.00	0.00	0.0%
3:00 PM	4,056.70	1,014.18	20.1%	0.00	0.00	0.0%
3:15 PM	4,634.54	1,158.64	23.0%	0.00	0.00	0.0%
3:30 PM	5,254.97	1,313.74	26.0%	0.00	0.00	0.0%
3:45 PM	5,943.48	1,485.87	29.5%	0.00	0.00	0.0%
4:00 PM	6,700.68	1,675.17	33.2%	0.00	0.00	0.0%
4:15 PM	7,561.14	1,890.28	37.5%	0.00	0.00	0.0%
4:30 PM	8,539.03	2,134.76	42.3%	0.00	0.00	0.0%
4:45 PM	9,687.15	2,421.79	48.0%	0.00	0.00	0.0%
5:00 PM	11,082.40	2,770.60	54.9%	0.00	0.00	0.0%
5:15 PM	12,816.15	3,204.04	63.5%	0.00	0.00	0.0%
5:30 PM	15,059.40	3,764.85	74.7%	0.00	0.00	0.0%
5:45 PM	17,975.95	4,493.99	89.1%	0.00	0.00	0.0%
6:00 PM	18,272.38	4,568.10	90.6%	0.00	0.00	0.0%
6:15 PM	17,569.31	4,743.71	87.1%	0.00	0.00	0.0%
6:31 PM	18,656.28	2,611.88	92.5%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

SEPTEMBER 13

Mirror date: March 29
Analysis hours: 7:50 AM-6:21 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:50 AM	19,648.60	1,571.89	97.4%	7.90	0.63	0.0%
8:00 AM	12,276.06	2,577.97	60.9%	0.00	0.00	0.0%
8:15 AM	8,530.01	2,132.50	42.3%	0.00	0.00	0.0%
8:30 AM	5,969.99	1,492.50	29.6%	0.00	0.00	0.0%
8:45 AM	3,933.38	983.34	19.5%	0.00	0.00	0.0%
9:00 AM	2,356.40	589.10	11.7%	0.00	0.00	0.0%
9:15 AM	1,559.96	389.99	7.7%	0.00	0.00	0.0%
9:30 AM	1,407.54	351.89	7.0%	0.00	0.00	0.0%
9:45 AM	1,367.40	341.85	6.8%	0.00	0.00	0.0%
10:00 AM	1,322.08	330.52	6.6%	0.00	0.00	0.0%
10:15 AM	1,295.01	323.75	6.4%	0.00	0.00	0.0%
10:30 AM	1,258.66	314.66	6.2%	0.00	0.00	0.0%
10:45 AM	1,237.93	309.48	6.1%	0.00	0.00	0.0%
11:00 AM	1,208.50	302.13	6.0%	0.00	0.00	0.0%
11:15 AM	1,192.72	298.18	5.9%	0.00	0.00	0.0%
11:30 AM	1,165.15	291.29	5.8%	0.00	0.00	0.0%
11:45 AM	1,151.26	287.82	5.7%	0.00	0.00	0.0%
12:00 PM	1,124.63	281.16	5.6%	0.00	0.00	0.0%
12:15 PM	1,111.64	277.91	5.5%	0.00	0.00	0.0%
12:30 PM	1,085.51	271.38	5.4%	0.00	0.00	0.0%
12:45 PM	1,072.32	268.08	5.3%	0.00	0.00	0.0%
1:00 PM	1,048.31	262.08	5.2%	0.00	0.00	0.0%
1:15 PM	1,241.71	310.43	6.2%	0.00	0.00	0.0%
1:30 PM	1,515.37	378.84	7.5%	0.00	0.00	0.0%
1:45 PM	1,901.44	475.36	9.4%	0.00	0.00	0.0%
2:00 PM	2,342.46	585.61	11.6%	0.00	0.00	0.0%
2:15 PM	2,811.36	702.84	13.9%	0.00	0.00	0.0%
2:30 PM	3,298.16	824.54	16.3%	0.00	0.00	0.0%
2:45 PM	3,823.82	955.95	19.0%	0.00	0.00	0.0%
3:00 PM	4,378.27	1,094.57	21.7%	0.00	0.00	0.0%
3:15 PM	4,984.45	1,246.11	24.7%	0.00	0.00	0.0%
3:30 PM	5,638.35	1,409.59	27.9%	0.00	0.00	0.0%
3:45 PM	6,368.56	1,592.14	31.6%	0.00	0.00	0.0%
4:00 PM	7,176.80	1,794.20	35.6%	0.00	0.00	0.0%
4:15 PM	8,103.15	2,025.79	40.2%	0.00	0.00	0.0%
4:30 PM	9,164.35	2,291.09	45.4%	0.00	0.00	0.0%
4:45 PM	10,452.32	2,613.08	51.8%	0.00	0.00	0.0%
5:00 PM	12,059.34	3,014.84	59.8%	0.00	0.00	0.0%
5:15 PM	14,096.27	3,524.07	69.9%	0.00	0.00	0.0%
5:30 PM	16,942.75	4,235.69	84.0%	0.00	0.00	0.0%
5:45 PM	18,641.43	4,660.36	92.4%	0.00	0.00	0.0%
6:00 PM	18,964.73	4,741.18	94.0%	0.00	0.00	0.0%
6:15 PM	18,499.97	3,330.00	91.7%	0.00	0.00	0.0%
6:21 PM	18,157.91	907.90	90.0%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

SEPTEMBER 20

Fall equinox (Spring equinox on March 22 similar)
Analysis hours: 7:57 AM-6:09 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:57 AM	16,634.77	332.70	82.5%	1,123.56	22.47	5.6%
8:00 AM	15,402.26	2,310.34	76.4%	860.72	129.11	4.3%
8:15 AM	10,636.28	2,659.07	52.7%	0.00	0.00	0.0%
8:30 AM	7,522.13	1,880.53	37.3%	0.00	0.00	0.0%
8:45 AM	5,277.34	1,319.34	26.2%	0.00	0.00	0.0%
9:00 AM	3,256.42	814.10	16.1%	0.00	0.00	0.0%
9:15 AM	2,098.58	524.64	10.4%	0.00	0.00	0.0%
9:30 AM	1,725.72	431.43	8.6%	0.00	0.00	0.0%
9:45 AM	1,633.98	408.49	8.1%	0.00	0.00	0.0%
10:00 AM	1,551.07	387.77	7.7%	0.00	0.00	0.0%
10:15 AM	1,494.32	373.58	7.4%	0.00	0.00	0.0%
10:30 AM	1,433.17	358.29	7.1%	0.00	0.00	0.0%
10:45 AM	1,395.93	348.98	6.9%	0.00	0.00	0.0%
11:00 AM	1,355.65	338.91	6.7%	0.00	0.00	0.0%
11:15 AM	1,332.57	333.14	6.6%	0.00	0.00	0.0%
11:30 AM	1,298.34	324.59	6.4%	0.00	0.00	0.0%
11:45 AM	1,279.20	319.80	6.3%	0.00	0.00	0.0%
12:00 PM	1,247.90	311.97	6.2%	0.00	0.00	0.0%
12:15 PM	1,231.06	307.76	6.1%	0.00	0.00	0.0%
12:30 PM	1,201.66	300.41	6.0%	0.00	0.00	0.0%
12:45 PM	1,186.03	296.51	5.9%	0.00	0.00	0.0%
1:00 PM	1,171.86	292.97	5.8%	0.00	0.00	0.0%
1:15 PM	1,430.13	357.53	7.1%	0.00	0.00	0.0%
1:30 PM	1,717.57	429.39	8.5%	0.00	0.00	0.0%
1:45 PM	2,160.89	540.22	10.7%	0.00	0.00	0.0%
2:00 PM	2,607.29	651.82	12.9%	0.00	0.00	0.0%
2:15 PM	3,092.27	773.07	15.3%	0.00	0.00	0.0%
2:30 PM	3,596.21	899.05	17.8%	0.00	0.00	0.0%
2:45 PM	4,143.70	1,035.93	20.5%	0.00	0.00	0.0%
3:00 PM	4,722.49	1,180.62	23.4%	0.00	0.00	0.0%
3:15 PM	5,360.81	1,340.20	26.6%	0.00	0.00	0.0%
3:30 PM	6,051.90	1,512.98	30.0%	0.00	0.00	0.0%
3:45 PM	6,828.22	1,707.06	33.8%	0.00	0.00	0.0%
4:00 PM	7,693.87	1,923.47	38.1%	0.00	0.00	0.0%
4:15 PM	8,694.19	2,173.55	43.1%	0.00	0.00	0.0%
4:30 PM	9,850.52	2,462.63	48.8%	0.00	0.00	0.0%
4:45 PM	11,315.50	2,828.88	56.1%	0.00	0.00	0.0%
5:00 PM	13,175.47	3,293.87	65.3%	0.00	0.00	0.0%
5:15 PM	15,635.04	3,908.76	77.5%	0.00	0.00	0.0%
5:30 PM	18,131.00	4,532.75	89.9%	0.00	0.00	0.0%
5:45 PM	18,891.33	4,722.83	93.6%	0.00	0.00	0.0%
6:00 PM	19,638.74	4,124.14	97.4%	0.00	0.00	0.0%
6:09 PM	19,846.66	1,587.73	98.4%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

SEPTEMBER 27

Mirror date: March 15
Analysis hours: 8:03 AM-5:58 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:03 AM	20,173.13	2,017.31	100.0%	0.00	0.00	0.0%
8:15 AM	13,254.00	2,915.88	65.7%	2,718.81	598.14	13.5%
8:30 AM	9,248.60	2,312.15	45.8%	0.00	0.00	0.0%
8:45 AM	6,690.46	1,672.61	33.2%	0.00	0.00	0.0%
9:00 AM	4,432.70	1,108.18	22.0%	0.00	0.00	0.0%
9:15 AM	2,797.13	699.28	13.9%	0.00	0.00	0.0%
9:30 AM	2,101.66	525.41	10.4%	0.00	0.00	0.0%
9:45 AM	1,934.72	483.68	9.6%	0.00	0.00	0.0%
10:00 AM	1,805.06	451.27	8.9%	0.00	0.00	0.0%
10:15 AM	1,713.56	428.39	8.5%	0.00	0.00	0.0%
10:30 AM	1,625.07	406.27	8.1%	0.00	0.00	0.0%
10:45 AM	1,568.90	392.22	7.8%	0.00	0.00	0.0%
11:00 AM	1,513.83	378.46	7.5%	0.00	0.00	0.0%
11:15 AM	1,482.73	370.68	7.4%	0.00	0.00	0.0%
11:30 AM	1,441.35	360.34	7.1%	0.00	0.00	0.0%
11:45 AM	1,416.54	354.14	7.0%	0.00	0.00	0.0%
12:00 PM	1,380.17	345.04	6.8%	0.00	0.00	0.0%
12:15 PM	1,359.55	339.89	6.7%	0.00	0.00	0.0%
12:30 PM	1,326.57	331.64	6.6%	0.00	0.00	0.0%
12:45 PM	1,311.70	327.93	6.5%	0.00	0.00	0.0%
1:00 PM	1,353.52	338.38	6.7%	0.00	0.00	0.0%
1:15 PM	1,648.53	412.13	8.2%	0.00	0.00	0.0%
1:30 PM	1,960.97	490.24	9.7%	0.00	0.00	0.0%
1:45 PM	2,427.67	606.92	12.0%	0.00	0.00	0.0%
2:00 PM	2,887.10	721.77	14.3%	0.00	0.00	0.0%
2:15 PM	3,387.81	846.95	16.8%	0.00	0.00	0.0%
2:30 PM	3,911.00	977.75	19.4%	0.00	0.00	0.0%
2:45 PM	4,480.72	1,120.18	22.2%	0.00	0.00	0.0%
3:00 PM	5,086.03	1,271.51	25.2%	0.00	0.00	0.0%
3:15 PM	5,756.63	1,439.16	28.5%	0.00	0.00	0.0%
3:30 PM	6,487.68	1,621.92	32.2%	0.00	0.00	0.0%
3:45 PM	7,313.81	1,828.45	36.3%	0.00	0.00	0.0%
4:00 PM	8,240.55	2,060.14	40.8%	0.00	0.00	0.0%
4:15 PM	9,321.02	2,330.26	46.2%	0.00	0.00	0.0%
4:30 PM	10,593.50	2,648.38	52.5%	0.00	0.00	0.0%
4:45 PM	12,254.16	3,063.54	60.7%	0.00	0.00	0.0%
5:00 PM	14,421.37	3,605.34	71.5%	0.00	0.00	0.0%
5:15 PM	17,419.17	4,354.79	86.3%	0.00	0.00	0.0%
5:30 PM	18,225.19	4,556.30	90.3%	0.00	0.00	0.0%
5:45 PM	19,287.59	4,436.15	95.6%	0.00	0.00	0.0%
5:58 PM	20,173.13	2,219.04	100.0%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

OCTOBER 4

Mirror date: March 8
Analysis hours: 8:09 AM-5:47 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:09 AM	20,141.32	805.65	99.8%	31.80	1.27	0.2%
8:15 AM	18,323.17	3,114.94	90.8%	1,849.96	314.49	9.2%
8:30 AM	11,235.13	2,808.78	55.7%	2,695.66	673.91	13.4%
8:45 AM	8,215.88	2,053.97	40.7%	0.00	0.00	0.0%
9:00 AM	5,848.74	1,462.18	29.0%	0.00	0.00	0.0%
9:15 AM	3,717.99	929.50	18.4%	0.00	0.00	0.0%
9:30 AM	2,574.36	643.59	12.8%	0.00	0.00	0.0%
9:45 AM	2,280.25	570.06	11.3%	0.00	0.00	0.0%
10:00 AM	2,093.30	523.32	10.4%	0.00	0.00	0.0%
10:15 AM	1,959.54	489.89	9.7%	0.00	0.00	0.0%
10:30 AM	1,836.90	459.23	9.1%	0.00	0.00	0.0%
10:45 AM	1,758.36	439.59	8.7%	0.00	0.00	0.0%
11:00 AM	1,684.86	421.22	8.4%	0.00	0.00	0.0%
11:15 AM	1,643.81	410.95	8.1%	0.00	0.00	0.0%
11:30 AM	1,594.47	398.62	7.9%	0.00	0.00	0.0%
11:45 AM	1,563.74	390.94	7.8%	0.00	0.00	0.0%
12:00 PM	1,521.91	380.48	7.5%	0.00	0.00	0.0%
12:15 PM	1,497.35	374.34	7.4%	0.00	0.00	0.0%
12:30 PM	1,460.53	365.13	7.2%	0.00	0.00	0.0%
12:45 PM	1,449.06	362.26	7.2%	0.00	0.00	0.0%
1:00 PM	1,511.48	377.87	7.5%	0.00	0.00	0.0%
1:15 PM	1,853.60	463.40	9.2%	0.00	0.00	0.0%
1:30 PM	2,238.95	559.74	11.1%	0.00	0.00	0.0%
1:45 PM	2,704.49	676.12	13.4%	0.00	0.00	0.0%
2:00 PM	3,178.19	794.55	15.8%	0.00	0.00	0.0%
2:15 PM	3,697.74	924.43	18.3%	0.00	0.00	0.0%
2:30 PM	4,239.63	1,059.91	21.0%	0.00	0.00	0.0%
2:45 PM	4,835.44	1,208.86	24.0%	0.00	0.00	0.0%
3:00 PM	5,469.69	1,367.42	27.1%	0.00	0.00	0.0%
3:15 PM	6,179.53	1,544.88	30.6%	0.00	0.00	0.0%
3:30 PM	6,954.47	1,738.62	34.5%	0.00	0.00	0.0%
3:45 PM	7,840.82	1,960.20	38.9%	0.00	0.00	0.0%
4:00 PM	8,836.81	2,209.20	43.8%	0.00	0.00	0.0%
4:15 PM	10,028.67	2,507.17	49.7%	0.00	0.00	0.0%
4:30 PM	11,465.96	2,866.49	56.8%	0.00	0.00	0.0%
4:45 PM	13,402.28	3,350.57	66.4%	0.00	0.00	0.0%
5:00 PM	16,334.10	4,083.53	81.0%	0.00	0.00	0.0%
5:15 PM	17,591.44	4,397.86	87.2%	0.00	0.00	0.0%
5:30 PM	18,584.27	5,017.75	92.1%	0.00	0.00	0.0%
5:47 PM	19,978.83	2,797.04	99.0%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

OCTOBER 11

Mirror date: March 1
Analysis hours: 8:16 AM-5:37 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:16 AM	20,066.42	2,407.97	99.5%	106.70	12.80	0.5%
8:30 AM	13,497.72	3,239.45	66.9%	5,480.28	1,315.27	27.2%
8:45 AM	10,023.99	2,506.00	49.7%	0.00	0.00	0.0%
9:00 AM	7,365.45	1,841.36	36.5%	0.00	0.00	0.0%
9:15 AM	4,954.86	1,238.72	24.6%	0.00	0.00	0.0%
9:30 AM	3,252.21	813.05	16.1%	0.00	0.00	0.0%
9:45 AM	2,678.19	669.55	13.3%	0.00	0.00	0.0%
10:00 AM	2,420.06	605.01	12.0%	0.00	0.00	0.0%
10:15 AM	2,235.78	558.94	11.1%	0.00	0.00	0.0%
10:30 AM	2,070.81	517.70	10.3%	0.00	0.00	0.0%
10:45 AM	1,965.51	491.38	9.7%	0.00	0.00	0.0%
11:00 AM	1,871.89	467.97	9.3%	0.00	0.00	0.0%
11:15 AM	1,817.48	454.37	9.0%	0.00	0.00	0.0%
11:30 AM	1,757.92	439.48	8.7%	0.00	0.00	0.0%
11:45 AM	1,720.75	430.19	8.5%	0.00	0.00	0.0%
12:00 PM	1,672.91	418.23	8.3%	0.00	0.00	0.0%
12:15 PM	1,644.06	411.02	8.1%	0.00	0.00	0.0%
12:30 PM	1,603.41	400.85	7.9%	0.00	0.00	0.0%
12:45 PM	1,598.43	399.61	7.9%	0.00	0.00	0.0%
1:00 PM	1,754.01	438.50	8.7%	0.00	0.00	0.0%
1:15 PM	2,107.95	526.99	10.4%	0.00	0.00	0.0%
1:30 PM	2,519.49	629.87	12.5%	0.00	0.00	0.0%
1:45 PM	2,990.90	747.73	14.8%	0.00	0.00	0.0%
2:00 PM	3,480.39	870.10	17.3%	0.00	0.00	0.0%
2:15 PM	4,020.59	1,005.15	19.9%	0.00	0.00	0.0%
2:30 PM	4,585.61	1,146.40	22.7%	0.00	0.00	0.0%
2:45 PM	5,213.12	1,303.28	25.8%	0.00	0.00	0.0%
3:00 PM	5,881.22	1,470.31	29.2%	0.00	0.00	0.0%
3:15 PM	6,632.24	1,658.06	32.9%	0.00	0.00	0.0%
3:30 PM	7,452.79	1,863.20	36.9%	0.00	0.00	0.0%
3:45 PM	8,394.42	2,098.61	41.6%	0.00	0.00	0.0%
4:00 PM	9,481.21	2,370.30	47.0%	0.00	0.00	0.0%
4:15 PM	10,843.03	2,710.76	53.7%	0.00	0.00	0.0%
4:30 PM	12,517.57	3,129.39	62.1%	0.00	0.00	0.0%
4:45 PM	14,896.22	3,724.05	73.8%	0.00	0.00	0.0%
5:00 PM	16,939.93	4,234.98	84.0%	0.00	0.00	0.0%
5:15 PM	18,079.72	4,519.93	89.6%	0.00	0.00	0.0%
5:30 PM	19,484.49	3,702.05	96.6%	0.00	0.00	0.0%
5:37 PM	19,995.57	1,199.73	99.1%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

OCTOBER 18

Mirror date: February 22
Analysis hours: 8:22 AM-5:27 PM (PDT)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:22 AM	20,173.13	1,210.39	100.0%	0.00	0.00	0.0%
8:30 AM	17,253.17	3,105.57	85.5%	2,919.95	525.59	14.5%
8:45 AM	12,057.59	3,014.40	59.8%	955.68	238.92	4.7%
9:00 AM	9,020.64	2,255.16	44.7%	0.00	0.00	0.0%
9:15 AM	6,571.35	1,642.84	32.6%	0.00	0.00	0.0%
9:30 AM	4,256.27	1,064.07	21.1%	0.00	0.00	0.0%
9:45 AM	3,195.18	798.80	15.8%	0.00	0.00	0.0%
10:00 AM	2,792.23	698.06	13.8%	0.00	0.00	0.0%
10:15 AM	2,546.10	636.52	12.6%	0.00	0.00	0.0%
10:30 AM	2,330.09	582.52	11.6%	0.00	0.00	0.0%
10:45 AM	2,191.47	547.87	10.9%	0.00	0.00	0.0%
11:00 AM	2,075.13	518.78	10.3%	0.00	0.00	0.0%
11:15 AM	2,005.94	501.49	9.9%	0.00	0.00	0.0%
11:30 AM	1,931.82	482.95	9.6%	0.00	0.00	0.0%
11:45 AM	1,886.79	471.70	9.4%	0.00	0.00	0.0%
12:00 PM	1,832.53	458.13	9.1%	0.00	0.00	0.0%
12:15 PM	1,799.19	449.80	8.9%	0.00	0.00	0.0%
12:30 PM	1,754.40	438.60	8.7%	0.00	0.00	0.0%
12:45 PM	1,757.49	439.37	8.7%	0.00	0.00	0.0%
1:00 PM	1,980.87	495.22	9.8%	0.00	0.00	0.0%
1:15 PM	2,352.82	588.20	11.7%	0.00	0.00	0.0%
1:30 PM	2,793.92	698.48	13.8%	0.00	0.00	0.0%
1:45 PM	3,282.34	820.59	16.3%	0.00	0.00	0.0%
2:00 PM	3,789.10	947.27	18.8%	0.00	0.00	0.0%
2:15 PM	4,354.24	1,088.56	21.6%	0.00	0.00	0.0%
2:30 PM	4,943.78	1,235.95	24.5%	0.00	0.00	0.0%
2:45 PM	5,597.70	1,399.43	27.7%	0.00	0.00	0.0%
3:00 PM	6,293.33	1,573.33	31.2%	0.00	0.00	0.0%
3:15 PM	7,079.52	1,769.88	35.1%	0.00	0.00	0.0%
3:30 PM	7,940.98	1,985.24	39.4%	0.00	0.00	0.0%
3:45 PM	8,936.89	2,234.22	44.3%	0.00	0.00	0.0%
4:00 PM	10,157.01	2,539.25	50.3%	0.00	0.00	0.0%
4:15 PM	11,703.86	2,925.97	58.0%	0.00	0.00	0.0%
4:30 PM	13,660.28	3,415.07	67.7%	0.00	0.00	0.0%
4:45 PM	16,149.78	4,037.45	80.1%	0.00	0.00	0.0%
5:00 PM	17,273.78	4,318.44	85.6%	0.00	0.00	0.0%
5:15 PM	18,681.50	4,109.93	92.6%	0.00	0.00	0.0%
5:27 PM	20,062.58	2,006.26	99.5%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

OCTOBER 25

Mirror date: February 15
Analysis hours: 7:30 AM-4:18 PM (PST)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:30 AM	20,173.13	2,622.51	100.0%	0.00	0.00	0.0%
7:45 AM	14,346.44	3,586.61	71.1%	844.53	211.13	4.2%
8:00 AM	10,889.66	2,722.41	54.0%	0.00	0.00	0.0%
8:15 AM	8,277.54	2,069.39	41.0%	0.00	0.00	0.0%
8:30 AM	5,680.45	1,420.11	28.2%	0.00	0.00	0.0%
8:45 AM	3,955.99	989.00	19.6%	0.00	0.00	0.0%
9:00 AM	3,308.56	827.14	16.4%	0.00	0.00	0.0%
9:15 AM	2,953.11	738.28	14.6%	0.00	0.00	0.0%
9:30 AM	2,644.68	661.17	13.1%	0.00	0.00	0.0%
9:45 AM	2,444.85	611.21	12.1%	0.00	0.00	0.0%
10:00 AM	2,293.45	573.36	11.4%	0.00	0.00	0.0%
10:15 AM	2,209.15	552.29	11.0%	0.00	0.00	0.0%
10:30 AM	2,121.40	530.35	10.5%	0.00	0.00	0.0%
10:45 AM	2,066.80	516.70	10.2%	0.00	0.00	0.0%
11:00 AM	2,003.78	500.94	9.9%	0.00	0.00	0.0%
11:15 AM	1,965.28	491.32	9.7%	0.00	0.00	0.0%
11:30 AM	1,914.83	478.71	9.5%	0.00	0.00	0.0%
11:45 AM	1,928.58	482.14	9.6%	0.00	0.00	0.0%
12:00 PM	2,212.78	553.20	11.0%	0.00	0.00	0.0%
12:15 PM	2,609.67	652.42	12.9%	0.00	0.00	0.0%
12:30 PM	3,064.28	766.07	15.2%	0.00	0.00	0.0%
12:45 PM	3,570.35	892.59	17.7%	0.00	0.00	0.0%
1:00 PM	4,095.65	1,023.91	20.3%	0.00	0.00	0.0%
1:15 PM	4,680.08	1,170.02	23.2%	0.00	0.00	0.0%
1:30 PM	5,285.99	1,321.50	26.2%	0.00	0.00	0.0%
1:45 PM	5,961.49	1,490.37	29.6%	0.00	0.00	0.0%
2:00 PM	6,681.36	1,670.34	33.1%	0.00	0.00	0.0%
2:15 PM	7,498.08	1,874.52	37.2%	0.00	0.00	0.0%
2:30 PM	8,394.11	2,098.53	41.6%	0.00	0.00	0.0%
2:45 PM	9,435.09	2,358.77	46.8%	0.00	0.00	0.0%
3:00 PM	10,776.88	2,694.22	53.4%	0.00	0.00	0.0%
3:15 PM	12,498.19	3,124.55	62.0%	0.00	0.00	0.0%
3:30 PM	15,072.55	3,768.14	74.7%	0.00	0.00	0.0%
3:45 PM	16,585.01	4,146.25	82.2%	0.00	0.00	0.0%
4:00 PM	18,083.83	4,520.96	89.6%	0.00	0.00	0.0%
4:15 PM	19,948.74	2,992.31	98.9%	0.00	0.00	0.0%
4:18 PM	20,121.26	603.64	99.7%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

NOVEMBER 1

Mirror date: February 8
Analysis hours: 7:36 AM-4:10 PM (PST)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:36 AM	20,173.13	1,412.12	100.0%	0.00	0.00	0.0%
7:45 AM	20,173.13	3,832.89	100.0%	0.00	0.00	0.0%
8:00 AM	12,995.63	3,248.91	64.4%	0.00	0.00	0.0%
8:15 AM	10,086.91	2,521.73	50.0%	0.00	0.00	0.0%
8:30 AM	7,368.20	1,842.05	36.5%	0.00	0.00	0.0%
8:45 AM	5,007.20	1,251.80	24.8%	0.00	0.00	0.0%
9:00 AM	3,908.56	977.14	19.4%	0.00	0.00	0.0%
9:15 AM	3,435.34	858.84	17.0%	0.00	0.00	0.0%
9:30 AM	3,031.76	757.94	15.0%	0.00	0.00	0.0%
9:45 AM	2,765.46	691.36	13.7%	0.00	0.00	0.0%
10:00 AM	2,553.40	638.35	12.7%	0.00	0.00	0.0%
10:15 AM	2,427.13	606.78	12.0%	0.00	0.00	0.0%
10:30 AM	2,319.22	579.80	11.5%	0.00	0.00	0.0%
10:45 AM	2,255.09	563.77	11.2%	0.00	0.00	0.0%
11:00 AM	2,183.90	545.97	10.8%	0.00	0.00	0.0%
11:15 AM	2,139.99	535.00	10.6%	0.00	0.00	0.0%
11:30 AM	2,088.84	522.21	10.4%	0.00	0.00	0.0%
11:45 AM	2,110.02	527.51	10.5%	0.00	0.00	0.0%
12:00 PM	2,445.28	611.32	12.1%	0.00	0.00	0.0%
12:15 PM	2,868.67	717.17	14.2%	0.00	0.00	0.0%
12:30 PM	3,326.10	831.52	16.5%	0.00	0.00	0.0%
12:45 PM	3,848.22	962.06	19.1%	0.00	0.00	0.0%
1:00 PM	4,385.12	1,096.28	21.7%	0.00	0.00	0.0%
1:15 PM	4,981.04	1,245.26	24.7%	0.00	0.00	0.0%
1:30 PM	5,599.61	1,399.90	27.8%	0.00	0.00	0.0%
1:45 PM	6,292.51	1,573.13	31.2%	0.00	0.00	0.0%
2:00 PM	7,031.42	1,757.85	34.9%	0.00	0.00	0.0%
2:15 PM	7,871.17	1,967.79	39.0%	0.00	0.00	0.0%
2:30 PM	8,791.70	2,197.93	43.6%	0.00	0.00	0.0%
2:45 PM	9,900.57	2,475.14	49.1%	0.00	0.00	0.0%
3:00 PM	11,401.95	2,850.49	56.5%	0.00	0.00	0.0%
3:15 PM	13,485.34	3,371.34	66.8%	0.00	0.00	0.0%
3:30 PM	15,679.15	3,919.79	77.7%	0.00	0.00	0.0%
3:45 PM	17,185.12	4,296.28	85.2%	0.00	0.00	0.0%
4:00 PM	19,185.01	4,028.85	95.1%	0.00	0.00	0.0%
4:10 PM	20,170.08	1,815.31	100.0%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

NOVEMBER 8

Mirror date: February 1
Analysis hours: 7:43 AM-4:03 PM (PST)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:43 AM	20,173.12	201.73	100.0%	0.00	0.00	0.0%
7:45 AM	20,173.13	2,622.51	100.0%	0.00	0.00	0.0%
8:00 AM	20,173.13	5,043.28	100.0%	0.00	0.00	0.0%
8:15 AM	11,997.06	2,999.27	59.5%	0.00	0.00	0.0%
8:30 AM	9,184.24	2,296.06	45.5%	0.00	0.00	0.0%
8:45 AM	6,613.19	1,653.30	32.8%	0.00	0.00	0.0%
9:00 AM	4,670.56	1,167.64	23.2%	0.00	0.00	0.0%
9:15 AM	3,991.70	997.93	19.8%	0.00	0.00	0.0%
9:30 AM	3,484.92	871.23	17.3%	0.00	0.00	0.0%
9:45 AM	3,129.27	782.32	15.5%	0.00	0.00	0.0%
10:00 AM	2,846.87	711.72	14.1%	0.00	0.00	0.0%
10:15 AM	2,670.31	667.58	13.2%	0.00	0.00	0.0%
10:30 AM	2,530.01	632.50	12.5%	0.00	0.00	0.0%
10:45 AM	2,447.17	611.79	12.1%	0.00	0.00	0.0%
11:00 AM	2,366.85	591.71	11.7%	0.00	0.00	0.0%
11:15 AM	2,316.92	579.23	11.5%	0.00	0.00	0.0%
11:30 AM	2,263.39	565.85	11.2%	0.00	0.00	0.0%
11:45 AM	2,289.00	572.25	11.3%	0.00	0.00	0.0%
12:00 PM	2,662.33	665.58	13.2%	0.00	0.00	0.0%
12:15 PM	3,104.27	776.07	15.4%	0.00	0.00	0.0%
12:30 PM	3,564.95	891.24	17.7%	0.00	0.00	0.0%
12:45 PM	4,097.74	1,024.43	20.3%	0.00	0.00	0.0%
1:00 PM	4,640.05	1,160.01	23.0%	0.00	0.00	0.0%
1:15 PM	5,243.15	1,310.79	26.0%	0.00	0.00	0.0%
1:30 PM	5,869.74	1,467.43	29.1%	0.00	0.00	0.0%
1:45 PM	6,574.20	1,643.55	32.6%	0.00	0.00	0.0%
2:00 PM	7,324.92	1,831.23	36.3%	0.00	0.00	0.0%
2:15 PM	8,177.93	2,044.48	40.5%	0.00	0.00	0.0%
2:30 PM	9,146.20	2,286.55	45.3%	0.00	0.00	0.0%
2:45 PM	10,377.08	2,594.27	51.4%	0.00	0.00	0.0%
3:00 PM	11,989.35	2,997.34	59.4%	0.00	0.00	0.0%
3:15 PM	14,426.76	3,606.69	71.5%	0.00	0.00	0.0%
3:30 PM	15,935.06	3,983.76	79.0%	0.00	0.00	0.0%
3:45 PM	17,816.75	4,454.19	88.3%	0.00	0.00	0.0%
4:00 PM	20,154.10	3,023.11	99.9%	0.00	0.00	0.0%
4:03 PM	20,173.12	605.19	100.0%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

NOVEMBER 15

Mirror date: January 25
Analysis hours: 7:51 AM-3:57 PM (PST)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:51 AM	20,173.13	1,613.85	100.0%	0.00	0.00	0.0%
8:00 AM	20,173.13	4,034.63	100.0%	0.00	0.00	0.0%
8:15 AM	18,455.58	4,613.90	91.5%	0.00	0.00	0.0%
8:30 AM	10,959.72	2,739.93	54.3%	0.00	0.00	0.0%
8:45 AM	8,361.61	2,090.40	41.4%	0.00	0.00	0.0%
9:00 AM	5,766.62	1,441.65	28.6%	0.00	0.00	0.0%
9:15 AM	4,637.27	1,159.32	23.0%	0.00	0.00	0.0%
9:30 AM	3,999.77	999.94	19.8%	0.00	0.00	0.0%
9:45 AM	3,542.76	885.69	17.6%	0.00	0.00	0.0%
10:00 AM	3,178.41	794.60	15.8%	0.00	0.00	0.0%
10:15 AM	2,949.67	737.42	14.6%	0.00	0.00	0.0%
10:30 AM	2,760.31	690.08	13.7%	0.00	0.00	0.0%
10:45 AM	2,647.49	661.87	13.1%	0.00	0.00	0.0%
11:00 AM	2,549.03	637.26	12.6%	0.00	0.00	0.0%
11:15 AM	2,491.20	622.80	12.3%	0.00	0.00	0.0%
11:30 AM	2,432.12	608.03	12.1%	0.00	0.00	0.0%
11:45 AM	2,458.67	614.67	12.2%	0.00	0.00	0.0%
12:00 PM	2,852.23	713.06	14.1%	0.00	0.00	0.0%
12:15 PM	3,309.32	827.33	16.4%	0.00	0.00	0.0%
12:30 PM	3,772.85	943.21	18.7%	0.00	0.00	0.0%
12:45 PM	4,308.99	1,077.25	21.4%	0.00	0.00	0.0%
1:00 PM	4,852.85	1,213.21	24.1%	0.00	0.00	0.0%
1:15 PM	5,460.72	1,365.18	27.1%	0.00	0.00	0.0%
1:30 PM	6,091.32	1,522.83	30.2%	0.00	0.00	0.0%
1:45 PM	6,802.06	1,700.52	33.7%	0.00	0.00	0.0%
2:00 PM	7,555.35	1,888.84	37.5%	0.00	0.00	0.0%
2:15 PM	8,409.22	2,102.31	41.7%	0.00	0.00	0.0%
2:30 PM	9,435.08	2,358.77	46.8%	0.00	0.00	0.0%
2:45 PM	10,749.88	2,687.47	53.3%	0.00	0.00	0.0%
3:00 PM	12,425.39	3,106.35	61.6%	0.00	0.00	0.0%
3:15 PM	14,553.94	3,638.48	72.1%	0.00	0.00	0.0%
3:30 PM	16,165.65	4,041.41	80.1%	0.00	0.00	0.0%
3:45 PM	18,537.72	4,263.67	91.9%	0.00	0.00	0.0%
3:57 PM	20,136.49	2,215.01	99.8%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

NOVEMBER 22

Mirror date: January 18
Analysis hours: 7:57 AM-3:54 PM (PST)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
7:57 AM	20,173.13	403.46	100.0%	0.00	0.00	0.0%
8:00 AM	20,173.13	3,025.97	100.0%	0.00	0.00	0.0%
8:15 AM	20,173.13	5,043.28	100.0%	0.00	0.00	0.0%
8:30 AM	12,726.32	3,181.58	63.1%	0.00	0.00	0.0%
8:45 AM	10,033.72	2,508.43	49.7%	0.00	0.00	0.0%
9:00 AM	7,239.38	1,809.85	35.9%	0.00	0.00	0.0%
9:15 AM	5,333.41	1,333.35	26.4%	0.00	0.00	0.0%
9:30 AM	4,546.42	1,136.61	22.5%	0.00	0.00	0.0%
9:45 AM	4,007.47	1,001.87	19.9%	0.00	0.00	0.0%
10:00 AM	3,550.01	887.50	17.6%	0.00	0.00	0.0%
10:15 AM	3,247.24	811.81	16.1%	0.00	0.00	0.0%
10:30 AM	2,998.12	749.53	14.9%	0.00	0.00	0.0%
10:45 AM	2,857.53	714.38	14.2%	0.00	0.00	0.0%
11:00 AM	2,745.15	686.29	13.6%	0.00	0.00	0.0%
11:15 AM	2,677.18	669.30	13.3%	0.00	0.00	0.0%
11:30 AM	2,602.55	650.64	12.9%	0.00	0.00	0.0%
11:45 AM	2,623.85	655.96	13.0%	0.00	0.00	0.0%
12:00 PM	3,008.63	752.16	14.9%	0.00	0.00	0.0%
12:15 PM	3,483.28	870.82	17.3%	0.00	0.00	0.0%
12:30 PM	3,945.75	986.44	19.6%	0.00	0.00	0.0%
12:45 PM	4,483.44	1,120.86	22.2%	0.00	0.00	0.0%
1:00 PM	5,025.01	1,256.25	24.9%	0.00	0.00	0.0%
1:15 PM	5,632.47	1,408.12	27.9%	0.00	0.00	0.0%
1:30 PM	6,256.41	1,564.10	31.0%	0.00	0.00	0.0%
1:45 PM	6,961.70	1,740.43	34.5%	0.00	0.00	0.0%
2:00 PM	7,707.52	1,926.88	38.2%	0.00	0.00	0.0%
2:15 PM	8,550.51	2,137.63	42.4%	0.00	0.00	0.0%
2:30 PM	9,598.33	2,399.58	47.6%	0.00	0.00	0.0%
2:45 PM	10,955.89	2,738.97	54.3%	0.00	0.00	0.0%
3:00 PM	12,744.82	3,186.20	63.2%	0.00	0.00	0.0%
3:15 PM	14,551.53	3,637.88	72.1%	0.00	0.00	0.0%
3:30 PM	16,384.03	4,096.01	81.2%	0.00	0.00	0.0%
3:45 PM	19,187.30	3,837.46	95.1%	0.00	0.00	0.0%
3:54 PM	20,108.07	1,608.65	99.7%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

NOVEMBER 29

Mirror date: January 11
Analysis hours: 8:04 AM-3:51 PM (PST)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:04 AM	20,173.12	1,815.58	100.0%	0.00	0.00	0.0%
8:15 AM	20,173.13	4,236.36	100.0%	0.00	0.00	0.0%
8:30 AM	20,173.12	5,043.28	100.0%	0.00	0.00	0.0%
8:45 AM	11,654.71	2,913.68	57.8%	0.00	0.00	0.0%
9:00 AM	8,845.29	2,211.32	43.8%	0.00	0.00	0.0%
9:15 AM	6,347.97	1,586.99	31.5%	0.00	0.00	0.0%
9:30 AM	5,085.45	1,271.36	25.2%	0.00	0.00	0.0%
9:45 AM	4,456.63	1,114.16	22.1%	0.00	0.00	0.0%
10:00 AM	3,919.37	979.84	19.4%	0.00	0.00	0.0%
10:15 AM	3,560.92	890.23	17.7%	0.00	0.00	0.0%
10:30 AM	3,246.61	811.65	16.1%	0.00	0.00	0.0%
10:45 AM	3,055.47	763.87	15.1%	0.00	0.00	0.0%
11:00 AM	2,923.14	730.78	14.5%	0.00	0.00	0.0%
11:15 AM	2,845.58	711.39	14.1%	0.00	0.00	0.0%
11:30 AM	2,757.66	689.41	13.7%	0.00	0.00	0.0%
11:45 AM	2,774.86	693.72	13.8%	0.00	0.00	0.0%
12:00 PM	3,046.64	761.66	15.1%	0.00	0.00	0.0%
12:15 PM	3,587.35	896.84	17.8%	0.00	0.00	0.0%
12:30 PM	4,074.04	1,018.51	20.2%	0.00	0.00	0.0%
12:45 PM	4,606.87	1,151.72	22.8%	0.00	0.00	0.0%
1:00 PM	5,140.35	1,285.09	25.5%	0.00	0.00	0.0%
1:15 PM	5,741.15	1,435.29	28.5%	0.00	0.00	0.0%
1:30 PM	6,354.95	1,588.74	31.5%	0.00	0.00	0.0%
1:45 PM	7,049.01	1,762.25	34.9%	0.00	0.00	0.0%
2:00 PM	7,782.04	1,945.51	38.6%	0.00	0.00	0.0%
2:15 PM	8,605.42	2,151.35	42.7%	0.00	0.00	0.0%
2:30 PM	9,635.29	2,408.82	47.8%	0.00	0.00	0.0%
2:45 PM	11,030.17	2,757.54	54.7%	0.00	0.00	0.0%
3:00 PM	12,785.40	3,196.35	63.4%	0.00	0.00	0.0%
3:15 PM	14,486.82	3,621.70	71.8%	0.00	0.00	0.0%
3:30 PM	16,492.23	4,123.06	81.8%	0.00	0.00	0.0%
3:45 PM	19,489.06	3,508.03	96.6%	0.00	0.00	0.0%
3:51 PM	20,090.99	1,004.55	99.6%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

DECEMBER 6

Mirror date: January 4
Analysis hours: 8:10 AM-3:51 PM (PST)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:10 AM	20,173.13	806.93	100.0%	0.00	0.00	0.0%
8:15 AM	20,173.13	3,429.43	100.0%	0.00	0.00	0.0%
8:30 AM	20,173.13	5,043.28	100.0%	0.00	0.00	0.0%
8:45 AM	15,073.74	3,768.43	74.7%	0.00	0.00	0.0%
9:00 AM	10,211.72	2,552.93	50.6%	0.00	0.00	0.0%
9:15 AM	7,555.17	1,888.79	37.5%	0.00	0.00	0.0%
9:30 AM	5,660.63	1,415.16	28.1%	0.00	0.00	0.0%
9:45 AM	4,865.81	1,216.45	24.1%	0.00	0.00	0.0%
10:00 AM	4,258.94	1,064.73	21.1%	0.00	0.00	0.0%
10:15 AM	3,842.81	960.70	19.0%	0.00	0.00	0.0%
10:30 AM	3,476.12	869.03	17.2%	0.00	0.00	0.0%
10:45 AM	3,234.40	808.60	16.0%	0.00	0.00	0.0%
11:00 AM	3,072.62	768.15	15.2%	0.00	0.00	0.0%
11:15 AM	2,985.04	746.26	14.8%	0.00	0.00	0.0%
11:30 AM	2,889.49	722.37	14.3%	0.00	0.00	0.0%
11:45 AM	2,897.93	724.48	14.4%	0.00	0.00	0.0%
12:00 PM	3,188.86	797.22	15.8%	0.00	0.00	0.0%
12:15 PM	3,698.86	924.72	18.3%	0.00	0.00	0.0%
12:30 PM	4,140.16	1,035.04	20.5%	0.00	0.00	0.0%
12:45 PM	4,666.01	1,166.50	23.1%	0.00	0.00	0.0%
1:00 PM	5,190.44	1,297.61	25.7%	0.00	0.00	0.0%
1:15 PM	5,782.29	1,445.57	28.7%	0.00	0.00	0.0%
1:30 PM	6,384.44	1,596.11	31.6%	0.00	0.00	0.0%
1:45 PM	7,064.12	1,766.03	35.0%	0.00	0.00	0.0%
2:00 PM	7,781.04	1,945.26	38.6%	0.00	0.00	0.0%
2:15 PM	8,585.16	2,146.29	42.6%	0.00	0.00	0.0%
2:30 PM	9,579.09	2,394.77	47.5%	0.00	0.00	0.0%
2:45 PM	10,918.81	2,729.70	54.1%	0.00	0.00	0.0%
3:00 PM	12,643.67	3,160.92	62.7%	0.00	0.00	0.0%
3:15 PM	14,332.12	3,583.03	71.0%	0.00	0.00	0.0%
3:30 PM	16,478.88	4,119.72	81.7%	0.00	0.00	0.0%
3:45 PM	19,491.42	3,313.54	96.6%	0.00	0.00	0.0%
3:51 PM	20,093.56	1,004.68	99.6%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

DECEMBER 13

Mirror date: December 28
Analysis hours: 8:15 AM-3:52 PM (PST)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:15 AM	20,173.12	2,420.77	100.0%	0.00	0.00	0.0%
8:30 AM	20,173.13	5,043.28	100.0%	0.00	0.00	0.0%
8:45 AM	20,173.13	5,043.28	100.0%	0.00	0.00	0.0%
9:00 AM	11,420.26	2,855.06	56.6%	0.00	0.00	0.0%
9:15 AM	8,754.90	2,188.73	43.4%	0.00	0.00	0.0%
9:30 AM	6,224.27	1,556.07	30.9%	0.00	0.00	0.0%
9:45 AM	5,258.47	1,314.62	26.1%	0.00	0.00	0.0%
10:00 AM	4,548.39	1,137.10	22.5%	0.00	0.00	0.0%
10:15 AM	4,076.08	1,019.02	20.2%	0.00	0.00	0.0%
10:30 AM	3,668.25	917.06	18.2%	0.00	0.00	0.0%
10:45 AM	3,382.22	845.56	16.8%	0.00	0.00	0.0%
11:00 AM	3,187.40	796.85	15.8%	0.00	0.00	0.0%
11:15 AM	3,087.42	771.85	15.3%	0.00	0.00	0.0%
11:30 AM	2,983.80	745.95	14.8%	0.00	0.00	0.0%
11:45 AM	2,974.18	743.55	14.7%	0.00	0.00	0.0%
12:00 PM	3,141.03	785.26	15.6%	0.00	0.00	0.0%
12:15 PM	3,698.14	924.53	18.3%	0.00	0.00	0.0%
12:30 PM	4,137.22	1,034.31	20.5%	0.00	0.00	0.0%
12:45 PM	4,655.82	1,163.95	23.1%	0.00	0.00	0.0%
1:00 PM	5,170.44	1,292.61	25.6%	0.00	0.00	0.0%
1:15 PM	5,753.07	1,438.27	28.5%	0.00	0.00	0.0%
1:30 PM	6,343.38	1,585.84	31.4%	0.00	0.00	0.0%
1:45 PM	7,007.56	1,751.89	34.7%	0.00	0.00	0.0%
2:00 PM	7,708.38	1,927.09	38.2%	0.00	0.00	0.0%
2:15 PM	8,499.38	2,124.85	42.1%	0.00	0.00	0.0%
2:30 PM	9,424.34	2,356.09	46.7%	0.00	0.00	0.0%
2:45 PM	10,697.71	2,674.43	53.0%	0.00	0.00	0.0%
3:00 PM	12,354.67	3,088.67	61.2%	0.00	0.00	0.0%
3:15 PM	14,073.42	3,518.35	69.8%	0.00	0.00	0.0%
3:30 PM	16,236.28	4,059.07	80.5%	0.00	0.00	0.0%
3:45 PM	19,274.89	3,469.48	95.5%	0.00	0.00	0.0%
3:52 PM	20,110.39	1,206.62	99.7%	0.00	0.00	0.0%

PROJECT: UCSF Parnassus
OPEN SPACE: Independence High School

DECEMBER 20

Winter solstice (December 21 similar)
Analysis hours: 8:19 AM-3:54 PM (PST)

Analysis Time	EXISTING SHADOW			UCSF PARNASSUS NET NEW SHADOW		
	Shadow Area (sf)	Area/Time (sfh)	Coverage	Shadow Area (sf)	Area/Time (sfh)	Coverage
8:19 AM	20,173.13	1,613.85	100.0%	0.00	0.00	0.0%
8:30 AM	20,173.12	4,236.35	100.0%	0.00	0.00	0.0%
8:45 AM	20,173.13	5,043.28	100.0%	0.00	0.00	0.0%
9:00 AM	12,279.51	3,069.88	60.9%	0.00	0.00	0.0%
9:15 AM	9,614.69	2,403.67	47.7%	0.00	0.00	0.0%
9:30 AM	6,824.44	1,706.11	33.8%	0.00	0.00	0.0%
9:45 AM	5,552.03	1,388.01	27.5%	0.00	0.00	0.0%
10:00 AM	4,748.72	1,187.18	23.5%	0.00	0.00	0.0%
10:15 AM	4,236.83	1,059.21	21.0%	0.00	0.00	0.0%
10:30 AM	3,797.85	949.46	18.8%	0.00	0.00	0.0%
10:45 AM	3,487.03	871.76	17.3%	0.00	0.00	0.0%
11:00 AM	3,256.19	814.05	16.1%	0.00	0.00	0.0%
11:15 AM	3,143.10	785.77	15.6%	0.00	0.00	0.0%
11:30 AM	3,032.83	758.21	15.0%	0.00	0.00	0.0%
11:45 AM	3,003.59	750.90	14.9%	0.00	0.00	0.0%
12:00 PM	3,064.65	766.16	15.2%	0.00	0.00	0.0%
12:15 PM	3,634.09	908.52	18.0%	0.00	0.00	0.0%
12:30 PM	4,068.13	1,017.03	20.2%	0.00	0.00	0.0%
12:45 PM	4,579.26	1,144.82	22.7%	0.00	0.00	0.0%
1:00 PM	5,085.60	1,271.40	25.2%	0.00	0.00	0.0%
1:15 PM	5,659.63	1,414.91	28.1%	0.00	0.00	0.0%
1:30 PM	6,239.94	1,559.98	30.9%	0.00	0.00	0.0%
1:45 PM	6,890.60	1,722.65	34.2%	0.00	0.00	0.0%
2:00 PM	7,576.72	1,894.18	37.6%	0.00	0.00	0.0%
2:15 PM	8,352.70	2,088.18	41.4%	0.00	0.00	0.0%
2:30 PM	9,214.28	2,303.57	45.7%	0.00	0.00	0.0%
2:45 PM	10,412.58	2,603.15	51.6%	0.00	0.00	0.0%
3:00 PM	11,971.72	2,992.93	59.3%	0.00	0.00	0.0%
3:15 PM	13,733.31	3,433.33	68.1%	0.00	0.00	0.0%
3:30 PM	15,761.67	3,940.42	78.1%	0.00	0.00	0.0%
3:45 PM	18,778.51	3,943.49	93.1%	0.00	0.00	0.0%
3:54 PM	20,118.99	1,609.52	99.7%	0.00	0.00	0.0%

Appendix SNA
Space Needs Assessment

UCSF COMPREHENSIVE PARNASSUS HEIGHTS PLAN (CPHP)
SPACE NEEDS ASSESSMENT REPORT

1.0 Introduction

As one of the country's leading health sciences campuses and UC's only campus focused exclusively on health sciences, UCSF's mission is to deliver instruction, conduct research, and provide clinical care, and all three elements of its mission are inter-dependent and inextricably linked.

UCSF's education enterprise includes the five professional degree programs (dentistry, medicine, nursing, pharmacy, and physical therapy), as well as interdisciplinary graduate programs and numerous postdoctoral programs. About 80 percent of UCSF instruction occurs at the Parnassus Heights campus site, with the balance at Mount Zion and Mission Bay. As noted in the 2014 Long Range Development Plan (LRDP), didactic instruction is expected to remain primarily at Parnassus Heights, and new instruction space is expected there, as well as at Mission Bay to support overall growth.

UCSF's research enterprise conducts research in biology, biochemistry, and other disciplines related to health and disease; carries out translational medicine studies in epidemiology, behavioral, and social sciences; studies health care policies; and provides training in each of these fields. With a health science focus, research benefits from adjacency to both the clinical and instructional facilities.

UCSF Health consists of the Medical Centers at Parnassus Heights, Mount Zion, and Mission Bay; UCSF Benioff Children's Hospitals in Oakland and San Francisco; patient care components of UCSF Helen Diller Family Comprehensive Cancer Center and UCSF Weill Institute for Neurosciences, including Langley Porter Psychiatric Hospital and Clinics; UCSF Benioff Children's Physicians; and the UCSF Faculty Practice.

The UCSF Medical Center is recognized as a world leader in health care. It consists of existing inpatient facilities at Parnassus Heights (Long and Moffitt Hospitals), three new specialty hospitals at Mission Bay, and outpatient clinics at these sites, at Mount Zion, and at numerous other locations throughout the City. As noted in the 2014 LRDP, new clinical space would be distributed among the Parnassus Heights, Mission Bay, and Mount Zion campus sites as appropriate to maintain or improve operational efficiency and enhance adjacencies with related research and instructional programs at those sites.

In addition to instructional, clinical and research space, other major LRDP space categories include (1) support space (includes subcategories of Academic Support, Academic and Campus Administration, Campus Community, and Logistics, and covers facilities like the central plants, EH&S, and other support facilities), (2) structured parking, and (3) housing for students, trainees and faculty. The 2014 LRDP plans for increases in these space categories in support of UCSF's primary mission and anticipated space need.

With regard to the Parnassus Heights campus site, the 2014 LRDP includes, among others, the following key objectives:

> A. Continue to promote excellence and leadership in health science education, maintaining the Parnassus Heights campus site as the central location for classroom instruction.
>
> B. Ensure that adequate space is provided to foster collaboration and to facilitate the interdependence and connectivity for operational efficiency and effectiveness of instruction, clinical, research and support uses in close physical proximity to each other.
>
> C. Ensure that Long Hospital and the New Hospital Addition have adequate clinical and administrative support and are aligned with education, research and specialized care programs and support that remain at the campus site.

The 2014 LRDP emphasizes investment in existing facilities and older sites, coupled with further development at the Mission Bay campus site.

Over the last 20 years, UCSF has made substantial investments in acquiring and developing its Mission Bay campus site and as of September 2019, the Mission Bay campus site totals approximately 3.25 million gsf of built space (excluding structure parking). Under the 2014 LRDP, Mission Bay is anticipated to grow to 5.14 million gsf by 2035. The LRDP assumes that Phase 2 of the Medical Center at Mission Bay would occur after 2035, beyond the 2014 LRDP planning horizon. The additional growth anticipated at Mission Bay was planned to support basic science research, as well as both inpatient and outpatient clinical care. Although the 2014 LRDP planned for a modest growth in clinical and research space at the Parnassus Heights campus site, UCSF has since determined that in order to ensure continued excellence of the University, stay competitive and remain a leading health science institution both nationally and internationally, similar investments must be made at Parnassus Heights campus site to keep pace with the investments made at the Mission Bay campus site.

In 2018, UCSF commenced a planning process to re-envision and revitalize the Parnassus Heights campus site. The purpose was to ensure the Parnassus Heights campus site was strongly positioned to advance the excellence of UCSF's clinical, educational, and research programs in direct support of the university's advancing health worldwide mission. UCSF's investment in Parnassus Heights has not kept pace with its aging and inadequate facilities, seismic needs, or changes in programmatic need, resulting in infrastructure, buildings, and interior spaces that require substantial renewal and investment. In addition, concerns regarding faculty and student recruitment and UCSF's ability to maintain the highest levels of patient care and research were identified. The Parnassus Heights planning process resulted in the development and publication of the Comprehensive Parnassus Heights Plan (CPHP), a long-term development framework with a planning horizon of 2050, for the revitalization of the Parnassus Heights physical environment.

The CPHP process was led by the Parnassus Master Planning (PMP) Steering Committee, comprising of faculty and senior administrators from across the campus and UCSF Health. PMP members helped define the programmatic strategy and vision for the Parnassus Heights campus site, including development of space needs, and oversaw the preparation of the CPHP.

The 2014 LRDP, which includes plans and strategies for growth at all of UCSF's major campus sites, was developed with a horizon year of 2035. UCSF will seek an amendment to the 2014 LRDP because implementation of the CPHP recommendations would require modification of the 2014 LRDP's Parnassus Heights development plan. If the LRDP amendment is approved, the CPHP would become the primary planning document for Parnassus Heights and would be used by UCSF to guide the development of the campus site for the next 30 years, to approximately year 2050.

Under the 1976 Regents' resolution, the Parnassus Heights campus site has a limit of 3.55 million gsf of developed space (commonly known as the "space ceiling"). Per the 2014 LRDP, the space ceiling amount excludes housing. Currently, Parnassus Heights is approximately 128,600 gsf, or about 3.6%%, above the space ceiling limit.

The purpose of this report is twofold:

- To summarize the projected space needs identified and recommended by the working groups and the PMP, and
- To note and validate any significant changes between the 2014 LRDP space need assumptions and projections for the Parnassus Heights campus site and the CPHP space need assumptions and projections.

2.0 The Comprehensive Parnassus Heights Plan

The PMP Steering Committee had oversight of four working groups focused on the topics of education space, research space, "digital hub" space for clinical informatics, and central research core space, also known as CoLabs. These working groups included campus researchers, faculty, staff, and clinicians, and each group produced a final report with recommendations for the Parnassus Heights campus site. These reports provide a high-level framework for future education and research platforms, as well as preferred programmatic, operational, and space needs. The recommendations from all four working groups are aligned on the need to better organize, co-locate, and improve the functionality of spaces, as well as provide new methods to share resources and facilities. The working group reports were reviewed, considered and accepted by the PMP. The CPHP working group reports are attached as Appendix A.

In addition to the four working groups, UCSF also convened the Parnassus Heights Community Working Group, comprising community leaders, neighbors, merchants, city representatives, and UCSF staff to engage the broader community in the Parnassus re-envisioning discussion and to identify potential improvements to enhance campus amenities and services to its adjoining neighbors and neighborhoods. The Community Working Group produced a Community Ideas report, which is attached as Appendix B. The CPHP incorporates and reflects many of the ideas captured in this report.

The research and analysis undertaken and completed by the four PMP working groups resulted in recommendations for additional growth of the Parnassus campus. Specifically, the space need recommendations identified by the PMP working groups were:

- Education Space Working Group: 80,000 gsf
- Research Space Working Group: 410,000 gsf
- Digital Hub Working Group: 40,000 gsf
- CoLabs Working Group: 22,000 gsf

The CPHP recommends that these space needs be met through a combination of repurposing and converting existing space, as well as through new construction after demolition. As such, the space needs identified by the working groups are not additive. Rather, only a portion of the future space needs would need to be met through the creation of net new space at Parnassus Heights. The recommendations from all four working groups are aligned on the need to better organize, co-locate, and improve the functionality of spaces, as well as provide new methods to share resources and facilities.

Since the adoption of the 2014 LRDP, UCSF has had significant inpatient volume growth driven by increases in high acuity/complex adult care (for example, cancer and neurosurgery). The growth of complex care demand is driving the need for additional beds. UCSF's catchment area has expanded over time, as the trends in health care have evolved, thus creating significant more demand for care at the Parnassus Heights campus site. Therefore, during the development of the CPHP, a parallel and coordinated effort to develop a master plan for the new hospital facility envisioned for Parnassus Heights in the 2014 LRDP was also commenced and continues to be the subject of detailed planning effort.

Investing in UCSF Health's future is critical to sustaining UCSF's public mission of providing top-quality care to all patients and supporting research and education. Moffitt Hospital was built in 1955 and physicians and staff are currently working in facilities that are outdated, inflexible, undersized, and clinically obsolete. Providing quality facilities is critical to retaining, as well as recruiting top-tier

clinicians, staff, researchers and students. In addition, State seismic laws (SB 1953) require Moffitt Hospital to be structurally retrofitted or decommissioned as an inpatient facility by 2030.

Affordable, accessible housing options are critical to the successful recruitment of faculty and students, as well as long-term employee retention, especially in light of the critical housing shortage in San Francisco. Therefore, the CPHP plans for more housing on the Parnassus Heights campus site, compared to what was envisioned in the 2014 LRDP.

The CPHP also envisions an increase in the total amount of usable open space on campus. The most notable of these spaces include the Millberry Terrace, to be located atop the altered or new Millberry Union garage; an expansion of Saunders Court; and the Promenade, to be located to the west of Saunders Court and south of the existing UC Hall, which will be the site of a new Research and Academic Building. The CPHP also proposes additional pathways leading to the Mount Sutro Open Space Reserve, creating a potential "park to peak" connection through campus. Some of the increase in usable open space would be achieved by demolition of existing buildings.

The CPHP incorporates planning elements that seek to improve mobility and campus housing while creating significantly more open space and greater community access in a high-quality, cohesive, integrated health sciences campus that embraces smart urban planning principles.

As shown in Table 1 below, the total amount of building space at the Parnassus Heights campus site at CPHP buildout would be approximately 5.97 million gsf, which includes 915,300 gsf of housing that would be excluded from the space ceiling. To implement the CPHP, the space ceiling at Parnassus Heights would need to increase by 1.5 million gsf, from 3.55 million gsf to 5.05 million gsf. This change would require an amendment to the LRDP and approval by the Regents.

TABLE 1
SPACE PROPOSED UNDER THE CPHP

Type of Space	Existing (2019) Total gsf	Total GSF under the CPHP Horizon 2050 Total gsf	Projected Net New Space Need Under the CPHP Total gsf
Instructional	290,300	290,300	0[a]
Research	709,800	1,018,700	308,900[b]
Clinical	1,030,800	1,872,700	841,900[cb]
Support			
Academic Support	193,800	193,800	0
Academic/Campus Admin	438,300	524,400	86,100
Campus Community	145,500	170,500	25,000
Logistics	107,400	150,900	43,500
Support Subtotal	885,000	1,039,600	154,600
Structured Parking	653,700	719,700	66,000
Vacant/Alteration	109,000	109,000	--
Housing	241,900	915,300	673,400
Total with Housing	**3,920,500**	**5,965,300**	**2,044,800**
Total without Housing	**3,678,600**	**5,050,000**	**1,371,400**

Notes:

a. The table shows no increase in instructional space because the additional instructional space (about 80,000 gsf) would be accommodated in renovated and repurposed existing spaces.

b. This is the net new space. Of the 472,000 gsf research space need identified (which includes 410,000 gsf of Research, 40,000 gsf Digital Hub and 22,000 gsf CoLabs), some of the need would be met through renovation of existing space or new construction after demolition.

c. Additional outpatient space needs would be met in existing space that is converted or renovated from other existing uses.

3.0 Need for Growth at Parnassus Heights

UCSF is a graduate-level university that is devoted exclusively to health sciences and is host to world-renowned science, from basic and quantitative biomedical sciences to translational and clinical research. Today, UCSF's public mission goes beyond San Francisco and delivers a substantial impact on a national and global level by innovating health care approaches for the world's most vulnerable populations, training the next generation of doctors, nurses, dentists, pharmacists, and scientists; supporting elementary and high school education; and translating scientific discoveries into better health for everyone. These three missions of clinical care, education, and research are inter-dependent and require balanced support to ensure continued excellence. With a health science focus, much of the research at UCSF benefits from adjacency to the clinical environment just as access to the most advanced research is important to support the clinicians. Similarly, the research and clinical environments provide critical training for students and learners at UCSF. The clinical, educational and research programs are inextricably linked. The physical environment supports UCSF's mission with outpatient and inpatient facilities, laboratory and other research spaces, classrooms and educational support spaces, academic offices, administrative and logistics spaces, community spaces, and housing for UCSF students, faculty, and their families.

Even with the development and growth of the Mission Bay campus, there is a long history of strong Parnassus Height research programs that must remain at Parnassus Heights and a robust research community is vital to the success of the academic medical center. It is critical to accommodate forecasted research and clinical growth at Parnassus Heights and include a new patient-centered hospital that is embedded with modern outpatient space, research space, and teaching space. The CPHP envisions an integrated Parnassus Heights campus site comprising world-class biomedical research, leading-edge patient care, and the highest standard of educational programs in life sciences and health professions. The New Hospital at Parnassus Heights (NHPH), which would provide adult tertiary and quaternary care and emergency care, needs to open in 2030. The patient care services provided at the NHPH will require the alignment and ongoing support and proximity of the research enterprise at Parnassus Heights and a vibrant UCSF campus of the future requires transformative new space for research and discovery. The CPHP provides this support with opportunities for renovation and creation of space for basic, translational, and clinical research.

Through an assessment of research programs and infrastructure at Parnassus Heights, the Research Space Working Group (RSWG) found that UCSF Parnassus Heights is home to numerous highly regarded biomedical research programs that are outstanding across the spectrum. In contrast, the current research space and infrastructure at Parnassus Heights, in many cases, are sub-standard and inadequate. Close to 80% of existing research space at Parnassus Heights is in buildings well over 50 years old and much of this space does not meet standards for modern research space and is not compliant with current building codes. Modern research space requires larger open spaces that provide flexibility for new programs, space to connect to other research functions, larger floor-to-floor height to accommodate modern infrastructure, and the ability to foster programmatic research interactions in common or shared space. Because there is a shortage of core research resource space, such as co-located shared core labs that facilitate collaboration, and digital hub space for clinical informatics research, many research programs are fragmented, causing difficulty in collaboration, and there is no room to grow or expand existing research programs.

The RSWG further found that the lack of investment in the Parnassus Heights research space infrastructure threatens the competitiveness and viability of Parnassus Heights-based research. The RSWG concluded that in order to transform and meet the campus' future research program needs, an increase in research space is essential.

UCSF's research activities benefit from the frequent personal connections that foster collaborations in discovery. The current medical center at Parnassus Heights, comprising Moffitt and Long hospitals, has convenient connections on every floor to the research and learning facilities in the Medical Sciences Building and is located near the Health Sciences East and West research towers. Parnassus Heights research teams are made up of clinicians, learners, faculty, and staff who leverage the full assets of the campus and the proximity to one another to create a variety of working partnerships. To realize the potential of world-class Parnassus Heights-based research programs, such as ImmunoX, and pioneer new discoveries in important research areas, including aging, metabolomics, microbiome, and others, research space for growth is needed. In addition, research and clinical trials, including National Institutes of Health-funded studies and industry-sponsored studies, benefit from proximity to the hospital, while patients benefit from innovative clinical care that results from these trials.

The CPHP re-envisioning of the Parnassus Height campus is an opportunity to highlight the future hospital at Parnassus Heights where new technologies will be embedded and leading clinicians and scientists will be focused on translating discoveries into treatments and cures.

The 2014 LRDP projected that there would be a need for a new 308,000 gsf hospital addition at Parnassus Heights. The current clinical needs identified at Parnassus Heights, based on evolving information and trends, is greater than what was assumed in the 2014 LRDP. It is now projected that the new hospital would be 955,000 gsf (or approximately 841,900 gsf of net new space) and that Moffitt Hospital would be retrofitted, but would not provide inpatient beds and would be converted to hospital support and other non-acute care uses. There are several factors that resulted in the change in the clinical growth projections. The need for seismic upgrades and replacement of outdated facilities at the Parnassus Heights campus site trigger additional space need requirements in order to comply with current code requirements and industry best practices. Learning from our current public health crisis and pandemic (COVID-19), it is extremely critical for clinical facilities to have the ability and flexibility to increase our inpatient capacity to accommodate the additional clinical needs during these times. The additional need for clinical space at Parnassus Heights is discussed in greater detail below, in Section 5.0 Need for Clinical Space and the New Hospital at Parnassus Heights.

4.0 Need for Instructional Space at UCSF Parnassus Heights

All five professional degree programs are located at Parnassus Heights campus site and classroom instruction for them will continue to occur primarily at Parnassus Heights. The Education Space Working Group (ESWG) comprised a range of faculty and staff from across the academic enterprise that was charged with addressing the space needs of these educational programs. The ESWG engaged with education mission stakeholders, including students; conducted an inventory of current shared and departmental instructional spaces; and explored the role of clinical and research space on the Parnassus Heights campus site as it intersects with the education mission. The ESWG envisions Parnassus Heights as a vibrant community to support student life, well-being, and learning on campus with a reimagined holistic experience.

Many of the 2014 LRDP space needs assumptions for the future of instructional space were validated in the CPHP as teaching and learning trends anticipated in the 2014 LRDP continue. As determined in both processes, future instructional space at UCSF must be flexible and designed to evolve and change due to the influence of new technologies and pedagogies.

The 2014 LRDP assumed that there would be a shift away from traditional instructor-centered teaching toward student-centered learning and informal learning spaces, using team-based and project-based methods within virtual and workplace environments (e.g. clinical and community settings). Similar to the assumptions used by the Instruction Subcommittee and included in the 2014 LRDP, the ESWG assumed

that teaching and learning would continue to evolve and change due to the influence of new technologies and that there would not be an overall reduction in instructional space at Parnassus Heights. Rather, different types of space would be needed to meet changing educational needs. The ESWG also envisions an innovative central education core to support active learning and inter-professional pedagogies, including the reconfiguration of existing education space.

This education core would integrate with clinical simulation space, updated modern classrooms, and lab space. The 2014 LRDP assumed instructional space would increase by about 25%, which would be met in existing repurposed space, with adjustments as needed to account for future learning needs.

As of September 2019, there is approximately 290,300 gsf of instructional space at Parnassus Heights. In order to accommodate the ESWG recommendations, the CPHP would provide approximately 80,000 gsf of additional instructional space. The majority of the identified space need would be accommodated in existing repurposed space. As such, there would be an increase of about 27% of instructional space from existing conditions, which is close to the 2014 LRDP projection for new instructional space.

Enrollment trends are only a small indicator and driver of space needs since enrollment trends and projections are unpredictable and it is customary that enrollment projections are limited to 10 years, therefore, much of the need for instructional space is not enrollment driven, but instead reflects research trends, research funding, and medical center growth. Both the 2014 LRDP and the current CPHP assumed very modest future enrollment growth, around 20%. Space identified in the CPHP would accommodate this estimated growth in enrollment. The anticipated instructional space needs (approximately 80,000 gsf) that were identified by the ESWG would be accommodated in existing repurposed and renovated spaces to meet the changing instructional needs.

5.0 Need for Clinical Space and the New Hospital at Parnassus Heights

UCSF Health has experienced significant growth in patient volumes in the last 10 years, which has increased pressure for expansion and growth in clinical facilities, including the Mission Bay expansion. The Smith Cardiovascular Research Building, which include clinical uses, opened in 2010, the Medical Center at Mission Bay opened in 2015, and the Bakar Precision Cancer Medicine Building opened in June 2019. Two more buildings that include clinical facilities, the Joan and Sanford I. Weill Neurosciences Building and the Wayne and Gladys Valley Center for Vision, are slated to open in 2020. In addition, just south of the Mission Bay campus site, in the Dogpatch neighborhood, the Child, Teen and Family Center and Department of Psychiatry Building is scheduled to open in 2021. This state-of-the-art facility will provide outpatient mental health services to Bay Area adults and children.

Need for Inpatient Clinical Space

The Helen Diller Medical Center (Medical Center) at Parnassus Heights which comprises Moffitt and Long Hospitals, provides highly specialized tertiary and quaternary adult care. As of September 2019, there was approximately 1,030,800 gsf of built clinical space and 475 inpatient beds at the Medical Center. The 2014 LRDP identified a New Hospital Addition as the only new clinical building proposed for the Parnassus Heights campus site during the 2014 LRDP planning period, driven predominantly by the need to comply by year 2030 with California's seismic requirements for hospitals.[1] UCSF determined that renovation of Moffitt Hospital to meet SB 1953 seismic standards and current code standards for inpatient use was not practical for several reasons. Moffitt Hospital was constructed in 1955 and the space in the hospital is outdated, undersized, inflexible and obsolete. Many of the existing hospital support functions in the hospital including the emergency room, surgery rooms, procedure rooms,

[1] Requirements of the State of California Alfred E. Alquist Hospital Facilities Seismic Safety Act of 1983.

patient rooms, the clinical lab, pharmacy, and sterile processing spaces are outdated and undersized to serve the current patient load. Floor to ceiling heights are not tall enough to accommodate contemporary equipment.

In 2014, UCSF proposed to comply with the state's requirements by decommissioning and replacing the inpatient facilities currently in Moffitt Hospital and constructing a new 308,000 gsf hospital addition that would be physically connected to Long Hospital, which complies with state seismic law, after demolishing the Langley Porter Psychiatric Institute (LPPI) building. Under the 2014 LRDP, a total of 439 inpatient beds would be provided in the New Hospital Addition and the existing Long Hospital by 2030. Detailed analysis of the clinical space needs at Parnassus Heights has continued to provide information to the hospital planning team. As a result of this continued analysis and to meet the projected patient demand, the New Hospital at Parnassus Heights (NHPH) will need to be larger than what was assumed in the 2014 LRDP.

According to UCSF Health, the Medical Center's inpatient census is at a record high and continues to experience unprecedented growth. Patient demand has exceed the projections made in the 2014 LRDP. The Medical Center at Parnassus Heights is already at capacity and has to turn away transfer patients who need complex care. The existing volume of inpatient admissions at UCSF Parnassus are understated due to capacity constraints preventing patient transfers and scheduling of surgical cases. In 2018, UCSF received over 5,500 requested medically necessary transfers, of which about 2,380 (or approximately 40%) were turned away due to lack of capacity. In 2019, over 3,000 patients were turned away (about 46%). It is anticipated that there will be a 14% increase in medically necessary transfers by 2030. Projected patient demand shows that UCSF must expand capacity. In addition, all of the scenarios below lead to safety, staffing, care quality, and patient satisfaction issues. For example, at the Parnassus hospitals:

- On average, more than five patients per night stay overnight in the Emergency Department (ED) while waiting for an inpatient bed, contributing to ED overcrowding, lack of privacy, delayed access to specialized care, and long wait times.
- Due to capacity constraints and lack of beds, more than two patients per weekday must stay overnight in the Post-Anesthesia Recovery Unit (PACU) following surgery, creating back-ups, delays, and cancellations for other scheduled surgeries.
- On average, four times each week the hospital is on "high capacity alert" as a result of too many patients in the ED, not enough critical care beds, and/or not enough acute care beds. This delays all clinically appropriate patient movement through the hospital.
- Shared rooms do not provide the privacy or space that patients and families need.

The complex tertiary and quaternary cases treated by UCSF specialists at Parnassus Heights are forecast to increase in number over the coming years and decades, due to the Bay Area's projected population growth, which includes an increase in the Medicare population due to an aging regional population. For example, complex cardiac surgery and neurosurgery cases are projected to increase by 30% in the next 10 years. These complex cases will require longer hospital stays and more hospital beds. The projected increases in population and complex cases will lead to a greater inpatient capacity deficit. These high acuity complex admissions will likely be concentrated at a small number of medical centers with the equipment and staff capable of caring for complex patients. These types of cases are critical to the research, education, and patient care mission delivered and provided by UCSF.

The Bay Area population has grown steadily over the last 10 years (around 1% per year) and growth is expected to continue at a similar pace moving forward, from an estimated 7.8 million in 2020 to 8.1

million by 2025.[2] Growth is also expected to be much greater in the older populations, with ages 65 and up growing almost 18% during this period, much faster than the younger age groups. National trends indicated there will be a 31% increase in the Medicare population over the next 10 years. In addition, there is an increase in the medical complexity of patients coming to the hospital as less complex cases are transitioned to outpatient settings. Higher medical complexity cases result in longer length of stay for each admission which drives the greater need for additional beds. Learning from the current pandemic (COVID-19), it is extremely critical for clinical facilities to be flexible and have the ability to increase inpatient capacity to accommodate the additional clinical needs, rather than reducing or canceling non-essential surgeries in order to reduce patient census, as has been done during the current pandemic. In addition, certain conditions and non-essential surgeries could turn critical if they go untreated for a prolonged period of time, putting additional strain on the healthcare system.

This projected growth in patient demand and the complex caseload, (e.g. neurosurgery, neurology, cardiac surgery, vascular surgery, diabetes, and cancer) will increase the total number of beds needed at the Medical Center. To accommodate the current rate of growth in specialty care areas, including the growth in referral and transfer requests from other healthcare providers, UCSF needs to plan for a larger new hospital at Parnassus Heights than what was contemplated in the 2014 LRDP.

Table 2 presents an overview of the existing Parnassus Heights hospital program, and the hospital programs envisioned under the 2014 LRDP and the proposed CPHP. As shown in Table 2, there are currently 325 inpatient beds at Long Hospital and 150 inpatient beds at Moffitt Hospital, for a total of 475 inpatient beds in a combined 754,000 gsf of building space. The 2014 LRDP envisioned a New Hospital Addition of about 308,000 gsf with 140 beds to replace the inpatient facilities that were in Moffitt Hospital; renovation and reuse of Moffitt Hospital for outpatient, support and other campus uses; and reduction in the inpatient beds at Long Hospital to 299 beds, for a total of approximately 439 inpatient beds at Parnassus Heights. At that time of preparation of the 2014 LRDP, the New Hospital Addition was based on replacing Moffitt Hospital to meet the clinical needs in response to SB 1953, with a minimal program that could be accommodated on the LPPI site.

However, for reasons set forth above, UCSF Health has determined that additional inpatient beds are necessary at the Parnassus Heights campus site and that under the CPHP, a total of 675 inpatient beds would be provided, an increase of 200 beds over existing conditions and 236 beds over the 2014 LRDP projections. Under the CPHP, the new NHPH would be 955,000 gsf (or approximately 841,900 gsf of net new space) and would provide 384 inpatient beds for a total bed count of 675 at Parnassus Heights when combined with the 291 inpatient beds in Long Hospital, compared to 439 total beds that were planned in the 2014 LRDP.

Table 2
Parnassus Heights Hospital Program

	Existing (2020)		**2014 LRDP Proposal**		**CPHP Proposal**	
	Beds	**GSF**	**Beds**	**GSF**	**Beds**	**GSF**
Moffitt Hospital	**150**	**385,800**	--	--	--	--
Long Hospital	**325**	**368,600**	299	368,600	291	368,600
Proposed New Hospital	**--**	**--**	140	308,000	384	955,000
Total	**475**	**754,400**	**439**	**676,600**	**675**	**1,323,600**

[2] Claritas Pop-Facts® 2020

Other factors informing the size of the NHPH include complying with applicable codes and regulations for new hospitals that require among other things taller floor-to-ceiling heights and additional space necessary to accommodate mechanical equipment and hospital support functions. The NHPH conceptual design also reflects considerations to further improve operational efficiency, including providing operating rooms and critical supporting functions on the same level.

Similar to the 2014 LRDP proposal, the current plan for the NHPH calls for the demolition of LPPI with construction to begin in mid-2023 and anticipated completion by about 2030. In addition to the construction of the NHPH for inpatient use, the Moffitt building would be retained and renovated for other hospital support and non-acute care uses.

The planning, design, and construction of a new, world-class hospital at Parnassus Heights will ensure that UCSF can continue to provide premier care to patients in the San Francisco Bay Area and beyond in the 21st century. The NHPH will also bolster UCSF's ability to provide high-quality, cost-effective health care. It will also allow UCSF Health to create a new optimal healing environment and to design a building based on "whole patient" need, with leading-edge diagnostic tests and therapies, incorporating privacy, views to nature (light and air), and the human connection. This will allow UCSF to connect the research discovery to patient healing and create a new hospital on par with the excellence and preeminence of UCSF's clinicians, scientists, staff, trainees, students and UCSF's mission.

Healthcare is continually evolving and changing. There are many factors and unknowns that continue to affect UCSF's clinical space needs projections, such as advances and changes in health care practices, rapid pace of scientific discovery, government regulation and mandates, impacts from other health care organizations located in UCSF's service area, the continued Bay Area population shifts, and the overall aging demographic. Ongoing changes in the local, regional, state and national healthcare landscape are being considered and factored in the planning of the NHPH.

In summary, based on observed and documented shortages in the availability of beds, especially ICU and acute care beds; an analysis of demographic trends that indicates that Parnassus Heights will need to serve not only a larger population but also a population that includes more elderly patients; an analysis of the demand/need for private rooms (vs. shared rooms/wards); and an analysis of trends in health care which show an increased need for tertiary and quaternary health care, UCSF has determined that a larger hospital is needed that not only replaces the 150 beds that are currently in Moffitt Hospital and the beds that would be reduced in Long Hospital once it is upgraded to current standards, but also provides an additional 200 beds, along with other necessary facilities that include additional operating rooms, additional ER bays and spaces, additional interventional labs, and ambulance bays.

The NHPH is planned to be located at the LPPI site so that it is adjacent to Long Hospital which would continue to provide 291 beds, and Moffitt Hospital which would be seismically retrofitted and renovated for clinical operations in support of both Long Hospital and the NHPH. This co-location of clinical uses would allow UCSF to operate more efficiently, allow the hospitals to share resources, and also minimize intra-campus travel for patients and staff. Further, the expanded clinical program at Parnassus Heights campus site would provide benefits to the research programs and critical training for students and learners, all of which would be enhanced by the adjacency of the three programs.

The projected clinical space need and increase in inpatient beds at Parnassus Heights would not change the 2014 LRDP assumptions related to the inpatient needs projected at Mission Bay. Under the 2014 LRDP, the Mission Bay campus site is expected to grow to 4.35 million gsf by 2035, excluding 786,100 gsf of housing and 1.39 million gsf in structured parking. The 2014 LRDP assumed that the additional beds planned under Phase 2 of the Medical Center at Mission Bay in the 793,500 gsf Phase 2 Hospital would occur after 2035, after the NHPH is completed and operational. Phase 2 of the Medical Center at

Mission Bay is planned to accommodate growth in women's, children's and/or cancer programs, and possibly a new service line. The additional space need in the NHPH would complement the services that currently exist at the Medical Center at Mission Bay.

Need for Outpatient Clinical Space

In the 2014 LRDP Space Needs Assessment Report, the projected outpatient growth through 2020 would be met in new outpatient buildings at Mission Bay with the construction and opening of several new buildings. For example, the new Precision Cancer Medical Center opened in 2019 and the Wayne and Gladys Center for Vision and the Joan and Sanford I. Weill Neurosciences Building are slated to open in 2020. The 2014 LRDP assumed that any future growth in outpatient space at Parnassus Heights would be met in existing facilities.

The 2014 LRDP projected a compound annual outpatient growth rate (CAGR) of 3% from 2010-2020, a 2% CAGR from 2020-2030, and a 1% CAGR for the final five years of the LRDP horizon (2030-2035). After the opening of the Mission Bay hospitals in 2015, there was a slight decline in outpatient visits to Parnassus Heights. This was expected with visits shifting to the Mission Bay campus site to support that campus' new hospitals and clinics. However, actual outpatient growth at Parnassus Heights campus site has outpaced 2014 LRDP projections. Since 2015, outpatient volume at Parnassus Heights has grown 6% annually, double the 2014 LRDP projections. Should this growth rate continue, alternative strategies to accommodate the additional outpatient growth will need to be developed.

Continuing the outpatient growth rate and assumption that was used in the 2014 LRDP for the final five years of the LRDP horizon, UCSF Health currently projects the same modest 1% growth per year at Parnassus Heights between 2030 and 2050. As with the 2014 LRDP, the CPHP does not plan for additional net new outpatient space. It is assumed that any outpatient space needs would be met in existing space that is converted or renovated from other existing uses.

The 2014 Space Needs Assessment assumed the anticipated clinical faculty office demand at Parnassus Heights could be met in existing facilities. However, under the new clinical growth projections, the additional faculty that are needed to support the growth associated with the New Hospital would generate additional clinical faculty office demand. This additional demand is accounted for in Campus Support Space, under the Academic and Campus Administrative category.

The net new clinical space in the CPHP totals 841,900 gsf. This reflects the relocation of some existing clinical uses and demolition of existing facilities, as well as the conversion and renovation of existing facilities to meet the projected net new clinical space need, including the New Hospital and outpatient surgery and imaging.

While there continue to be many uncertainties regarding the future healthcare landscape, the 2014 LRDP and the CPHP set forth the planning for physical facilities to provide flexibility to accommodate anticipated future demand and growth. It will be crucial to continually reassess clinical and other space needs over time and to make adjustments as needed, including through amendments to the 2014 LRDP as necessary.

6.0 Need for Research Space at UCSF Parnassus Heights

Three working groups (Research, Central Research Labs, and Digital Hub) were formed to determine the future research space needs at Parnassus Heights.

The Research Space Working Group (RSWG) conducted a review of Parnassus Heights research activities and areas of programmatic strength and reviewed assessments of research space conditions and utilization, as well as the quality and function of associated research infrastructure.

The RSWG vision for Parnassus Heights is an integrated campus comprising world-class health science research, leading-edge patient care, and the highest quality educational programs. The RSWG envisions a magnet science community at Parnassus Heights that supports a blend of basic, clinical, and translational research activities, each with a critical mass of faculty. Because the last 20 years of UCSF investments in research facilities have been focused at Mission Bay, the RSWG recommended a renewed focus on Parnassus Heights. Additionally, the expansion of the clinical enterprise at Parnassus Heights calls for additional research space to support the new hospital with top-tier basic, clinical, and translational research.

Of the total number of Principal Investigators (PIs) at Parnassus Heights, about 45% of PIs conduct Parnassus-based sponsored projects involving patient-facing research. Currently, there is a lack of designated clinical research space in patient care areas of the hospitals and clinics and properly designed clinical research space for patient cohorts, clinical trials and mechanism-oriented clinical research. This created suboptimal interactions and collaborations with UCSF Health.

Growth in research at Parnassus Heights cannot be accommodated in existing remodeled/renovated space. The RSWG recommends immediate expansion and transformation of the Parnassus Heights research facilities to address existing challenges and deficiencies in the current research space infrastructure and to allow future expansion. The new research space would address the current unmet need for research space and address the need for future growth.

The RSWG came to some of the same findings as the 2014 LRDP Research Subcommittee: Parnassus Heights is experiencing difficulty recruiting and retaining young faculty due to insufficient research space both in terms of quality and quantity, fragmented research programs and a shortage of Core resources. Currently, only 23% of researchers at Parnassus Heights are junior faculty. That is 1/3 fewer assistant professors than at Mission Bay. Nationally, benchmarks suggest research campuses have an even distribution between senior and junior faculty. In order to attract and retain junior faculty, ensure a healthy research enterprise and maintain a balance of junior, mid-level and senior faculty, the RSWG concluded that an investment in research space is urgently needed. The group found a real need and desire to create inspiring research space with program adjacencies and design elements that spur connectivity, community, and innovation to promote research and discovery. In terms of the research enterprise, the CPHP uses some new terminologies that were not used in the 2014 LRDP. The Central Research Labs (CoLabs) concept comprises co-located shared core labs that facilitate collaboration. The Digital Hub space is focused on clinical informatics and desktop research in four core areas: entrepreneurship and training, simulation and testing, collaboration and resources, and education/training.

The 2014 LRDP accounted for these types of space needs in general research spaces, enabling technology or research cores, and research support type spaces. The 2014 LRDP assumed that any growth in research space at Parnassus Heights would be accommodated in underutilized or renovated space. While research space would continue to grow at Mission Bay, the 2014 LRDP assumed that overall research space would decrease slightly to about 711,200 gsf at Parnassus Heights by 2035, the 2014 LRDP planning horizon. The research growth assumptions used in the 2014 LRDP were based on historic funding trends and assumed the following:

- For years 2012-2016: Research funding will not increase and demand for research space will not increase
- For years 2017 - 2021: Research space will increase with growth in research funding, however research space need will be accommodated in existing space

- For years 2022 - 2030: Research space needs will increase as research funding grows, requiring new research space. A 2.5% growth rate was used from 2022-2030
- For years 2031 - 2035: No additional funding growth was assumed since it would be too speculative to estimate beyond 2030

In 2014, research space at the Parnassus Heights campus site totaled 802,200 gsf. Currently, the existing research space at Parnassus Heights is approximately 709,800 gsf, which is slightly less than what was projected to occur by 2035 and less than the space that existed in 2014. The decrease in gsf is due to moves to Mission Bay after the opening of the hospitals in 2015 and renovations of existing buildings that are currently underway at Parnassus Heights. However, research funding – which leads to demand for research space – has far exceeded the 2014 LRDP projections over the last five years. Funding assumptions used in the 2014 LRDP were conservative. According to UCSF's Budget and Resource Management Office, UCSF's CAGR over the last 5 years is approximately 5% vs. 2.5% assumed in the 2014 LRDP. Both the 2014 LRDP and the current CPHP assumes a modest growth (about 2%) in PIs over the next 20 years (through 2035 for the LRDP and 2040 for the CPHP, no assumptions were made beyond 2040 for the CPHP). The RSWG recommends using current industry standards for Core (20% factor) and animal space (15% factor) to account for these types of research space needs in the CPHP. These standards are higher than what was used in the 2014 LRDP (10% factor for both Core and animal space).

Given the current research climate and new research assumptions, and based on recent actual growth rates as well as national trends, the three research working groups projected an additional research space need of approximately 472,000 gsf at Parnassus Heights.

Offices associated with research space need were included in the RSWG request, and that office space is accounted for in Campus Support space, under the category of Academic and Campus Administrative. Some of these research space needs would be met through renovation of existing space or new construction after demolition. Of the 472,000 gsf research space need that was identified, the projected net new research space need is estimated to be 308,900 gsf.

7.0 Need for Campus Support Space

In addition to Instruction, Clinical, and Research spaces, campus support space also needs to grow proportionally to provide the essential services and continued support for the growth of the Parnassus Heights campus site. Campus support functions consist of the following:

- Academic Support, which includes activities supporting the academic enterprise such as the library and animal care;
- Academic and Campus Administration, which includes all administrative activities at the department, school and campus level, including the deans' and directors' offices, conference rooms, and non-academic support activities such as police, personnel and accounting offices;
- Campus Community, which includes activities and amenities that are provided to the larger campus community, such as recreation, fitness, childcare, retail and food service; and
- Logistics, which includes activities devoted to the delivery of material and physical plant activities such as machine shops, service yards, laundry services, utilities, and storage.

As of September 2019, there is approximately 885,000 gsf of total built support space at Parnassus Heights. General growth factors were used for the 2014 LRDP to account for corresponding support uses that would be needed to support the future growth of the campus. Rather than using similar growth

factors, Academic Support needs were incorporated in the research space need projections. For Academic and Campus Administration, Campus Community and Logistics space, a small amount of space would be needed to support the anticipated growth at Parnassus Heights. A modest amount of Campus Community and Logistics space is included to account for the proposed Irving Street Arrival Unified Lobby and the Service Corridor projects that are proposed under the CPHP. Under the full buildout of the CPHP, an estimated net new campus support space of about 154,600 gsf is projected.

8.0 Need for On-Campus Housing

Affordable, accessible housing options are critical to the successful recruitment of faculty and students, as well as long-term employee retention, especially in light of the critical housing shortage in San Francisco. Currently, across all UCSF sites, there are 1,248 units of faculty and student/trainee housing. In the summer of 2021, 71 additional units for faculty housing will be available at 2130 Post Street. Based on a Housing Study conducted in 2015, the estimated demand in 2025 for student/trainee housing would be about 2,030 units. Estimated demand for faculty housing would be 345 units, predominantly for incoming junior faculty. The estimated demand far exceeds what is currently available across UCSF campus sites.

The CPHP includes the development of new housing, both to address the needs of the Parnassus Heights community and to offset the pressures on San Francisco's existing housing inventory. UCSF also recognizes that the development of campus housing reduces commute trips by faculty, students and staff. The CPHP envisions densification of the existing Aldea housing complex site and explores long-term housing opportunity on the west side of the campus site, along a new Fourth Avenue extension. The densification of the Aldea housing complex and the total increase in campus housing is necessary to offset the increase in campus population and the non-residential growth of the CPHP.

The 2014 LRDP assumed that approximately 175,000 gsf of existing non-residential uses at Parnassus Heights would be converted to new housing by the LRDP planning horizon. Under the 2014 LRDP, about 329 units of housing would be proposed by the 2035 planning horizon. Upon full implementation of the 2014 LRDP, there would be a total of about 550 housing units on the Parnassus Heights campus site. Compared to the 2014 LRDP, the CPHP would provide less housing in the initial phase (by 2030) but overall, would provide up to about 760 net new units of housing by 2050, bringing the total amount of campus housing on the campus site to about 984 units, about 915,300 gsf of campus housing.

It is anticipated that the Aldea housing complex would continue to be prioritized for student families. Densification of the Aldea housing complex would occur in two phases. The first phase would occur by 2030 and would require the demolition of three existing aging structures in order to provide up to 142 net new units. Phase 2 with 190 net new units would occur at a later date. Upon completion of phase 2, a total of 332 net new units would be added to the Aldea housing complex for a total of 504 units. Based on the housing capacity study that was done as part of the CPHP, up to approximately 430 net new housing units could be accommodated in the West Side district on both sides of the newly proposed Fourth Avenue extension. Upon full implementation of the CPHP, approximately 762 additional units or about 673,400 gsf of net new housing, could be accommodated at the Parnassus Heights campus site. UCSF must increase its housing stock in order to support the campus's long-term housing objectives and accommodate some of the housing demand at Parnassus Heights that is generated with the proposed CPHP development. UCSF is committed to exploring creative ways to provide additional housing and housing options to help meet the needs of its students, faculty and workforce.

9.0 Total Projected Net New Space Need and Space Ceiling

The total amount of existing built space at the Parnassus Heights campus site in 2019 was 3,920,500 gsf, which includes 241,900 gsf of housing. Under the full implementation of the CPHP, the projected net new space needs by LRDP program category at Parnassus Heights are shown in Table 1 on page 4. This total projected space need forms the basis for the physical development of the Parnassus Heights campus site under the CPHP. While the majority of the projected space need would be met through new construction (2.9 million gsf) after demolition (about 875,000 gsf) of existing facilities, some of the projected space need would be accommodated through a combination of conversion and renovation of underutilized space within existing facilities in order to meet current priorities.

Currently, UCSF occupies a total of approximately 3.92 million gsf at Parnassus Heights. Taking into account efficiency gained through renovations and demolitions of existing space, UCSF's space at Parnassus Heights would increase by 2.04 million gsf under the proposed CPHP. With the full implementation of the CPHP, UCSF's total space at Parnassus Heights is estimated to be 5.97 million gsf.

A "space ceiling" limit of 3.55 million gsf currently exists at Parnassus Heights under the 1976 Regents' Resolution. Of the 5.97 million gsf at full development under the CPHP, approximately 915,300 gsf would be devoted to housing, which does not count towards the space ceiling. As shown in Table 1, excluding housing, the projected net new space need is approximately 1.37 million gsf. As of September 2019, and shown in Table 3 below, approximately 3.68 million gsf of space is subject to the space ceiling, which is approximately 128,600 gsf or about 3.6% above the 3.55 million gsf space ceiling limit. Including the future space need of 1.37 million gsf, the total amount of space subject to the space ceiling would be 5.05 million gsf. With the full implementation of the CPHP, the space ceiling overage prior to a proposed amendment to the 2014 LRDP would be about 1.5 million gsf or about 42% above the current 3.55 million gsf space ceiling limit.

TABLE 3
PARNASSUS HEIGHTS SPACE CEILING OVERAGE CALCULATION

	Total gsf	GSF Overage	Percentage Space Ceiling Overage
Space Ceiling	3,550,000		
2019 Existing Space	3,920,500		
Existing Housing	241,900		
2019 Space Subject to the Space Ceiling	3,678,600	128,600	3.6%
2019 Existing Space	3,920,500		
Projected Net New GSF under CPHP at full buildout (2050)	2,044,200		
Total Space under CPHP at full buildout	5,965,300		
Total Housing	915,300		
CPHP Space Subject to the Space Ceiling	**5,050,000**	**1,500,000**	**42%**

APPENDICES INCLUDE:

1. CPHP Research Space Working Group Report
2. CPHP CRL- CoLabs_Report1
3. CPHP CoLabs 2019 Report2
4. CPHP Digital Hub Working Group Report
5. CPHP Educational Space Working Group Report
6. Hospital Sizing 2020-06

UCSF
University of California
San Francisco

Research Space Working Group (RSWG)

December 20, 2018
PMP Steering Committee Meeting

Co Chairs
Tamara Alliston
John Fahy

Committee
Robert Blelloch
Jason Cyster
Andrei Goga
Julene Johnson
Thomas Lang
Janel Long-Boyle
Shaeri Mukherjee
Rushika Perera
Art Weiss
Carol Dawson-Rose
Christine Nguyen
Maria Dall'Era
Jeffrey Lotz

Lindsey Criswell

Support
Cara Fladd
Sharon Priest
Joy Glasier
Maryam Farshad

Research Space Working Group Charge

- **Research Space Working Group (RSWG)**: A representative committee reporting to campus leadership as part of the Comprehensive Parnassus Heights Plan project.
- **RSWG Charge**: To develop guiding principles for research space at Parnassus Heights.

How much research space does PH need?

What kind of research space does PH need?

Before we start...

PH research space planning in a 2018 context

- Development of the UCSF-MB campus nearing completion.
- Relative neglect of the UCSF-PH campus threatening its viability as a world class research campus.
- Groundswell of support from faculty and leadership to rejuvenate the PH campus.
- $500MM Diller gift for a new PH hospital.
- Comprehensive Parnassus Heights Plan (CPHP) - possibility for PH to be “re-born.”

UCSF Helen Diller Medical Center at PH



UCSF Helen Diller Medical Center at PH



RSWG

Recognition of the unique opportunity to create an integrated campus at UCSF-PH comprising cutting edge patient care, world class biomedical research, & highest standard education programs in life sciences & health professions.

UCSF Mission

Advance health worldwide through ..

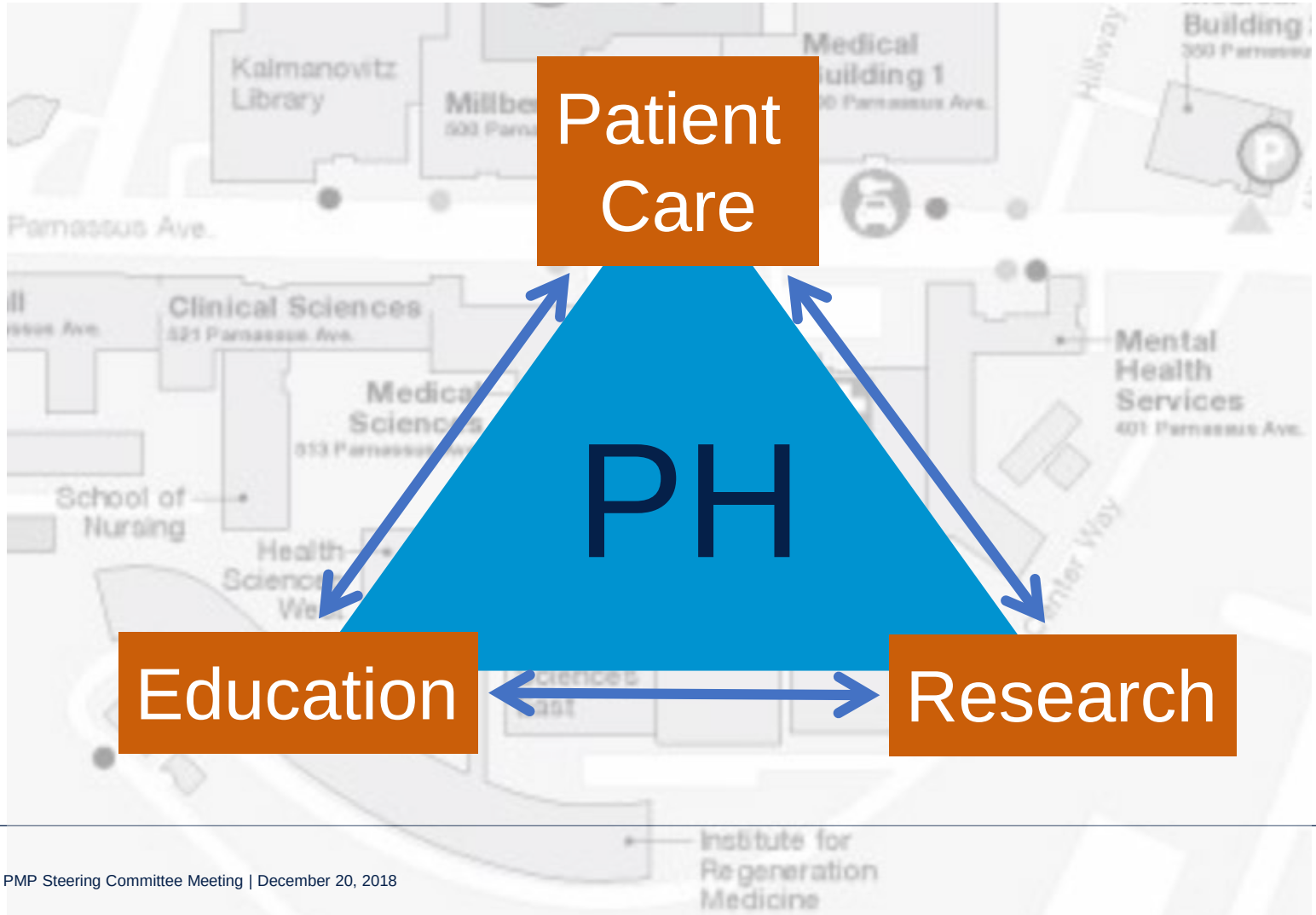
preeminent biomedical **research**

graduate-level **education** in the life sciences and health professions

and excellence in **patient care**.

RSWG and the CPHP process

The unique opportunity to create an integrated world-class UCSF campus at PH



UCSF

Overview of RSWG Guiding Principles for the PH Research Enterprise

1. World-class biomedical research campus:

- a magnet science community
- architecture and design that inspires innovation & discovery

2. Blend of research activities - basic, clinical, translational:

- not dominated by any research category or program
- each research activity represented by a critical mass of faculty

3. Research activities that are integrated with one another and:

- UCSF Helen Diller Medical Center
- UCSF education programs

RSWG - Main Recommendation

- Immediately expand and transform the Parnassus Heights research campus to meet the urgent needs of current and future research programs.

- Plan for an increase in research space from current 550,000 ASF to proposed 875,000 ASF.

Phase 1 (immediately):

(i) Build Parnassus Discovery Hall - 150,000 ASF.
(ii) Build Center for Innovative Medicine - 75,000 ASF.
(iii) Renovate HSIR-East, HSIR-West, and Medical Sciences.

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Phase 2 (5-10 years)

New Research Building(s) – 100,000 ASF

Why should PH accommodate 875K of research space?

1. Overview of RSWG Process

2. Overview of Current PH Research Enterprise
   - Space
   - Investigators
   - Programs

3. Recommendations for space and other research needs

RSWG - Overview of Process

1. Meetings

- RSWG: monthly, March – December 2018.
- RSWG Executive Team: weekly, March – December 2018

2. Sources of Information

- Research survey - Vice Chancellor of Research - Spring 2018
- Research space data - Campus Planning, Space Management
- Research funding data – Budget and Resource Management
- National research space ‘benchmarks’ – Perkins Eastman, Jacobs
- Grassroots and leadership – Stakeholder outreach and meetings

Overview of Current PH Research Enterprise – Research Space

How much research space is available at PH?

558,000 ASF [a] *currently* available

Completed	Building	Space (ASF)
1917	UC Hall	26,000
1941	Langley Porter (LPPI)	26,000
1954	Medical Science Building	117,000
1955	Millberry Union	9,000
1955	Moffitt Hospital	14,000
1956	Proctor Foundation	4,000
1964	HSIR East	130,000
1964	HSIR West	109,000
1964	LPPI Butler Building	1,000
1966	Surge	5,000
1972	ACC Building	10,000
1972	School of Nursing	19,000
1979	School of Dentistry	11,000
1982	Long Hospital	3,000
1986	Koret Vision Research	21,000
1991	Kalmanovitz Library	4,000
2005	PSB	8,000
2010	Dolby	41,000
	Total	**558,000**

- Total space at PH

  = 1,777,000 ASF

- 31% = research space

10 Buildings are more than 50 years old

(a) Research Space includes: academic office, dry lab, wet lab, wet lab support, & Medical Center academic space = broader characterization than for ICR (only considers academic office space assigned to PI with awards).

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20 of 28 HSE/HSW floors remodeled

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2005	PSB	8,000
2010	Dolby	41,000
	Total	**558,000**

- Total space at PH

  = 1,777,000 ASF

- 31% = research space

10 buildings are more than 50 years old

20 of 28 HSE/HSW floors remodeled

49,000 ASF research space in last 20 years

(a) Research Space includes: academic office, dry lab, wet lab, wet lab support, & Medical Center academic space = broader characterization than for ICR (only considers academic office space assigned to PI with awards).

How much research space is available at PH?

550,000 ASF [a] available when accounting for decanted buildings

Completed	Building	Current	2019-2030
1917	UC Hall	26,000	
1941	Langley Porter (LPPI)	26,000	
1954	MSB	117,000	117,000
1955	Millberry Union	9,000	9,000
1955	Moffitt Hospital	14,000	14,000
1956	Proctor Foundation	4,000	
1964	HSIR East	130,000	130,000
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1979	School of Dentistry	11,000	11,000
1982	Long Hospital	3,000	3,000
1986	Koret Vision Research	21,000	
1991	Kalmanovitz Library	4,000	4,000
2005	PSB	8,000	8,000
2010	Dolby	41,000	41,000
2020	Clinical Sciences		75,000
	Total	**558,000**	**550,000**

6 buildings to be decanted

Clinical Sciences is re-opening in 2020

(a) Research Space includes: academic office, dry lab, wet lab, wet lab support, & Medical Center academic space = broader characterization than for ICR (only considers academic office space assigned to PI with awards).

How does PH compare to MB: ASF?

	Current	2019-2030
Parnassus Heights		
Total ASF	1,777,000	1,656,000
Research ASF	558,000	550,000
% Research ASF	31	33
% Growth in Research ASF		**-1%**
Mission Bay		
Total ASF	1,497,000	2,238,000
Research ASF	546,000	864,000
% Research ASF	36	39
% Growth in Research ASF		**58%**

How does PH compare to MB: Space Utilization?

1. A healthy research campus requires some underutilized space.

2. Old space drives PH space underutilization

   - 30% of HSE/HSW has not been remodeled.

3. Remodeled PH research space is hyper-utilized.

   - Current PH research is projected to require 600K ASF, but has 550K.

Parnassus Heights:	**55% Utilized**		
	% Utilization	Building	Completed
Most Utilized	87% 73%	HSE 15 Dolby	2010 2010
Least Utilized	49%	HSE	1964
Average	55%	HSW	1964
Mission Bay:	**70% Utilized**		
	% Utilization	Building	Completed
Most Utilized	83%	Byers	2005
Least Utilized	50% 65%	Smith CVRI Genentech	2010 2002
Average	72%	Cancer Center	2008

Remodeling old PH research space will not accommodate growth.

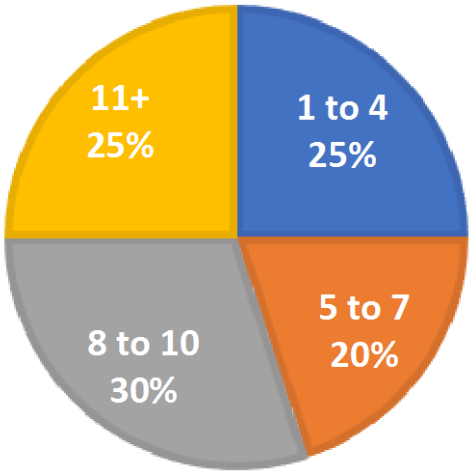
Overview of Current PH Research Enterprise – Investigators and Programs

Current PH Research Enterprise
PH Investigators

- Number of PH PIs[a]: 427 PIs (40% of UCSF PIs)
- Academic research benchmarks suggest even faculty rank distribution.
- 55% Senior Faculty: Full Professors are overrepresented at PH
- 23% Junior Faculty: 1/3 fewer Assistant Professors at PH than MB
- PH Group Size: 25% small, 50% medium, 25% large research groups

(a) PI: all PI's of Sponsored Research Projects.

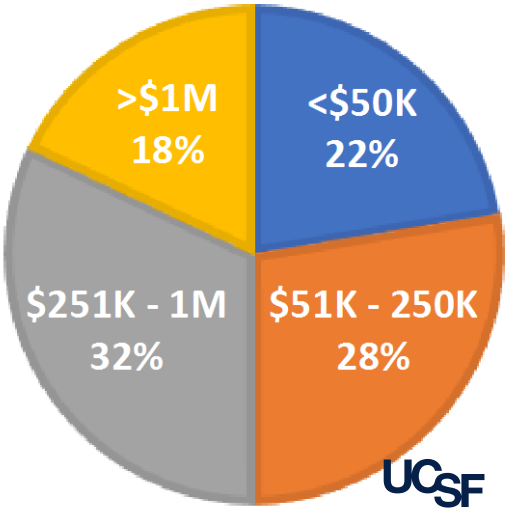
Researchers per PH F



Current PH Research Enterprise
PH Investigators – Robust Funding

- Funding: $309 MM in annual research funding (direct & indirect, 2016)
- PH ICR/ASF is 14% lower than MB
  - PH ICR/ASF: $153
  - MB ICR/ASF: $177
- Modern space design affords a 15% efficiency
- Suggests that PH ICR/ASF is on par with MB

Direct Costs per PH P



Current PH Research Enterprise
Types of Research and Research Space

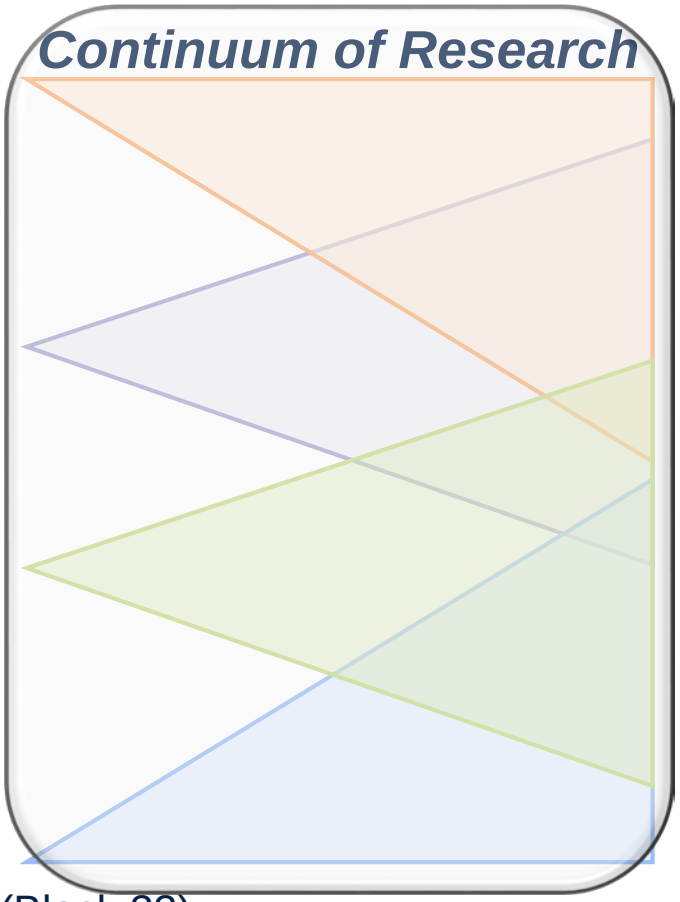
Types of Research

(*2018 Research Survey data).

1. Basic (40%)
2. Translational (21%)
3. Clinical (27%)
4. Population (12%)

Many PIs moving to MB (Block 33).

Staying at PH: Tobacco Center, SOD, some SON.



Types of Research Space

	ASF/Researcher
1. Bench/Wet	200
Hybrid	150
2. Computational	100
Hybrid	150
3. Patient Facing	225
4. Hospital & Clinics	
5. Community	

Current PH Research Enterprise
Basic Science Program

History of Strong PH Research Programs

Longstanding Programs	Research that 'stayed' at PH	'Post-MB' PH Programs
Cancer	Cell Biology (SOD)	Craniofacial
Diabetes	Research in Clinical Depts	Dev & Stem Cell Biology
Liver Science	(OB/Gyn, Orthopaedics, etc.)	Human Genetics
Lung Science		Immunology
		Microbial Pathogenesis

Present: Diverse mix of outstanding investigators

- High-impact fundamental & translational discoveries
- Many #1 programs and investigators
- Strong Centers and Programs (P30, T32 etc.)
- New initiatives that synergistically advance UCSF mission at PH (i.e. Aging)

Current PH Research Enterprise
Basic Science Program

Challenges:

- **Insufficient space** quality and quantity - no room to grow
- **Gridlock** to remodeling
- **Difficulty recruiting** faculty & trainees – '2nd tier campus'
- **Fragmented programs** – difficult to colocate collaborators
- **Shortage of core resources**

"Despite its international preeminence and extraordinary success by all objective measures including the highest levels of indirect costs per square foot at Parnassus, the center is bursting at the seams…"

- Matthias Hebrok, Diabetes Center

UCSF

Current PH Research Enterprise
- Clinical Research programs involving patient contact

- 239 faculty[a]
- 45% are female
- 190 are PIs on PH-based sponsored projects that involve patient-facing research.
- 226 clinical research coordinators.
- Diverse, successful & growing programs in multiple clinical departments across schools.
- A large portion of UCSF's research funding ($117.1MM) annually in research funding.

(a) 79% of faculty are "PI" with Sponsored Research Projects.

Current PH Research Enterprise

- Clinical Research programs involving patient contact

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- A large portion of UCSF's research funding ($117.1MM annually in research funding).

- Organ diseases (heart, lung, liver, kidney, brain, bowel)
- Transplant medicine & surgery
- Heme malignancies, immuno-oncology, neuro-oncology
- Rheumatology & orthopaedics
- Symptom science
- Diabetes & endocrine diseases
- Dental & oral diseases
- Health disparities
- Hospital medicine, palliative care
- Imaging & devices

Current PH Research Enterprise
Clinical Science Programs - Challenges

1. History of **poor advocacy** to generate research resources from campus leadership.

2. Lack of **properly designed space** for research involving patient cohorts, clinical trials and mechanism-oriented clinical research in human subjects

3. Lack of **designated research space** in patient care areas of the hospitals and clinics.

4. Suboptimal **interactions and collaborations** with UCSF Health.

How much research space is needed to properly support current and future basic, clinical, and translational research at PH?

How much research space is needed at PH?

Factor Considered	Values Used	Explanation
Current PH Research ASF	550,000 ASF	• Research ASF in 2030 based on Campus Planning analysis
Current PH PIs	427 PIs	• PIs of sponsored research projects at PH.

-

How much research space is needed at PH?

Factor Considered	Values Used	Explanation	
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Growth over 20 Years	1-2%	• **1% Growth:** 521 PIs	• **2% Growth:** 634 PIs

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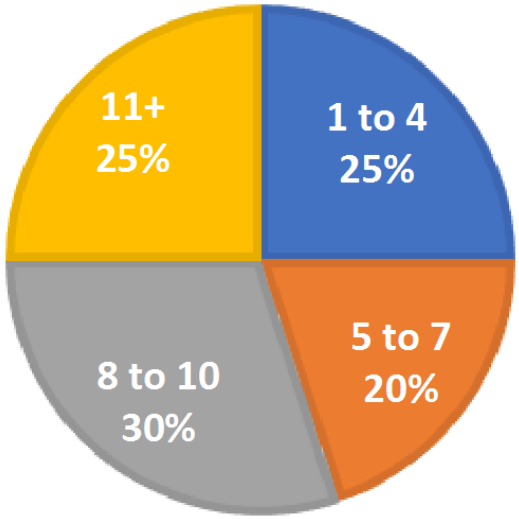
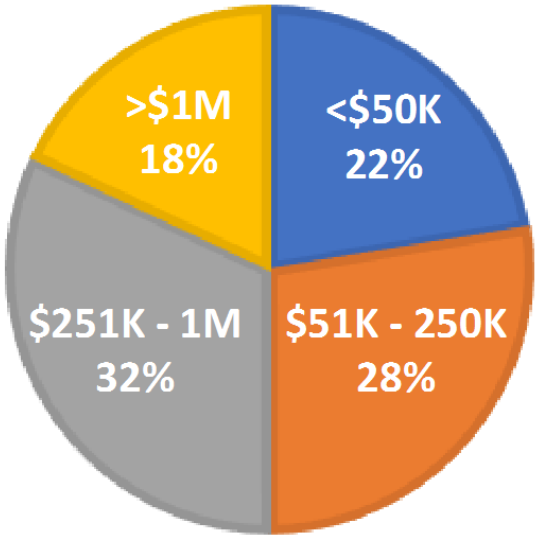


Researchers per PH PI



Direct Costs per PH PI

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Type of Research	All Types *New: Clinical*	• Addresses the need for all types of research at PH. • Addresses unmet need for clinical research space	
ASF/Investigator	Core-centric Standards	• Wet: 170 ASF • Computational: 100 ASF	• Hybrid: 135 ASF • Clinical: 190 ASF

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Core Space	20% Cores 15% Animals	• 20% of new ASF of non-computational space for Cores • 15% of new ASF of wet research space for Animal Space • Percentages derived from industry standards

How much research space is needed at PH?

Growth in PIs	Group Size: 9 (PI+8)
1%	722,106 ASF
2%	878,724 ASF

Modest growth projections yield a research space calculation of 722,000 - 875,000 ASF.

Realizing the transformative potential of PH requires that we right size the research for growth and success.

Why should PH accommodate 875K of research space?

1. A vibrant UCSF campus of the future requires **transformative new space for research and discovery.**

2. To realize the impact of new hospital and to support the flourishing PH clinical research enterprise, **clinical research** space is urgently needed.

3. PH can achieve the UCSF vision for **Precision Medicine** with an integrated network of outstanding investigators across the **continuum of research**.

4. To realize the potential of **world-class PH-based research programs**, such as ImmunoX and others, space for growth is needed.

5. To **pioneer new research areas**, such as aging, metabolomics, microbiome, and others, space for growth is needed.

6. To **attract and retain junior faculty** to balance 55% senior faculty, space is urgently needed.

Recommendation 1

How much research space does PH need?

Recommendation 1

Expand and transform the PH research campus to meet the urgent needs of current and future research programs.

TWO PHASE APPROACH

Phase 1 (Immediate, near term):

• **Construct** cores and a new research building with 150,000 ASF for research to accommodate growth of existing programs and development of new programs.

• **Construct** a clinical research building with 75,000 ASF as a Center for Innovative Medicine.

• **Renovate** the main research buildings (HSIR East and West, Medical Sciences) to modern gold-standard research space.

Phase 2 (Medium term):

• **Build** 100,000 ASF of additional research space to meet the ongoing needs of strong and emerging research programs.

Future Research Space at UCSF-PH: Phase 1

Completed	Building	Current	2019-2030
1917	UC Hall	26,000	
1941	Langley Porter (LPPI)	26,000	
1954	MSB	117,000	117,000
1955	Millberry Union	9,000	9,000
1955	Moffitt Hospital	14,000	14,000
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2005	PSB	8,000	8,000
2010	Dolby	41,000	41,000
2020	Clinical Sciences		75,000
Immediate Future	"Parnassus Hall" Research Building		150,000
Immediate Future	Center for Innovative Medicine		75,000
	Total	**558,000**	**775,000**

Propose 775,000 ASF for Research at PH In Phase 1

Renovate HSIR East and West and MSB

Construct Parnassus Hall and the Center for Innovative Medicine

UCSF

Future Research Space at UCSF-PH: Phase 2

Completed	Building	Current	2019-2030
1917	UC Hall	26,000	
1941	Langley Porter (LPPI)	26,000	
1954	MSB	117,000	117,000
1955	Millberry Union	9,000	9,000
1955	Moffitt Hospital	14,000	14,000
1956	Proctor Foundation	4,000	
1964	HSIR East	130,000	130,000
1964	HSIR West	109,000	109,000
1964	LPPI Butler Building	1,000	
1966	Surge	5,000	
1972	ACC Building	10,000	10,000
1972	School of Nursing	19,000	19,000
1979	School of Dentistry	11,000	11,000
1982	Long Hospital	3,000	3,000
1986	Koret Vision Research	21,000	
1991	Kalmanovitz Library	4,000	4,000
2005	PSB	8,000	8,000
2010	Dolby	41,000	41,000
2020	Clinical Sciences		75,000
Immediate Future	"Parnassus Hall" Research Building		150,000
Immediate Future	Center for Innovative Medicine		75,000
"Phase 2"	Additional Research Space		100,000
	Total	**558,000**	**875,000**

Propose 875,000 ASF for Research at PH In Phase 2

Renovate HSIR East and West and MSB

Construct Parnassus Hall and the Center for Innovative Medicine

Construct Additional Research Space in Phase 2 To Provide Needed Space for Growth of Research Programs

UCSF

Constructing the new Parnassus Heights research space infrastructure

Critical considerations

1. Speed is paramount to rejuvenate PH research space.
   - capture current momentum of world-class programs
   - prevent talent flight
   - compete for best recruits (faculty and students)

2. Urgency in resolving the unmet need for clinical research space and infrastructure.

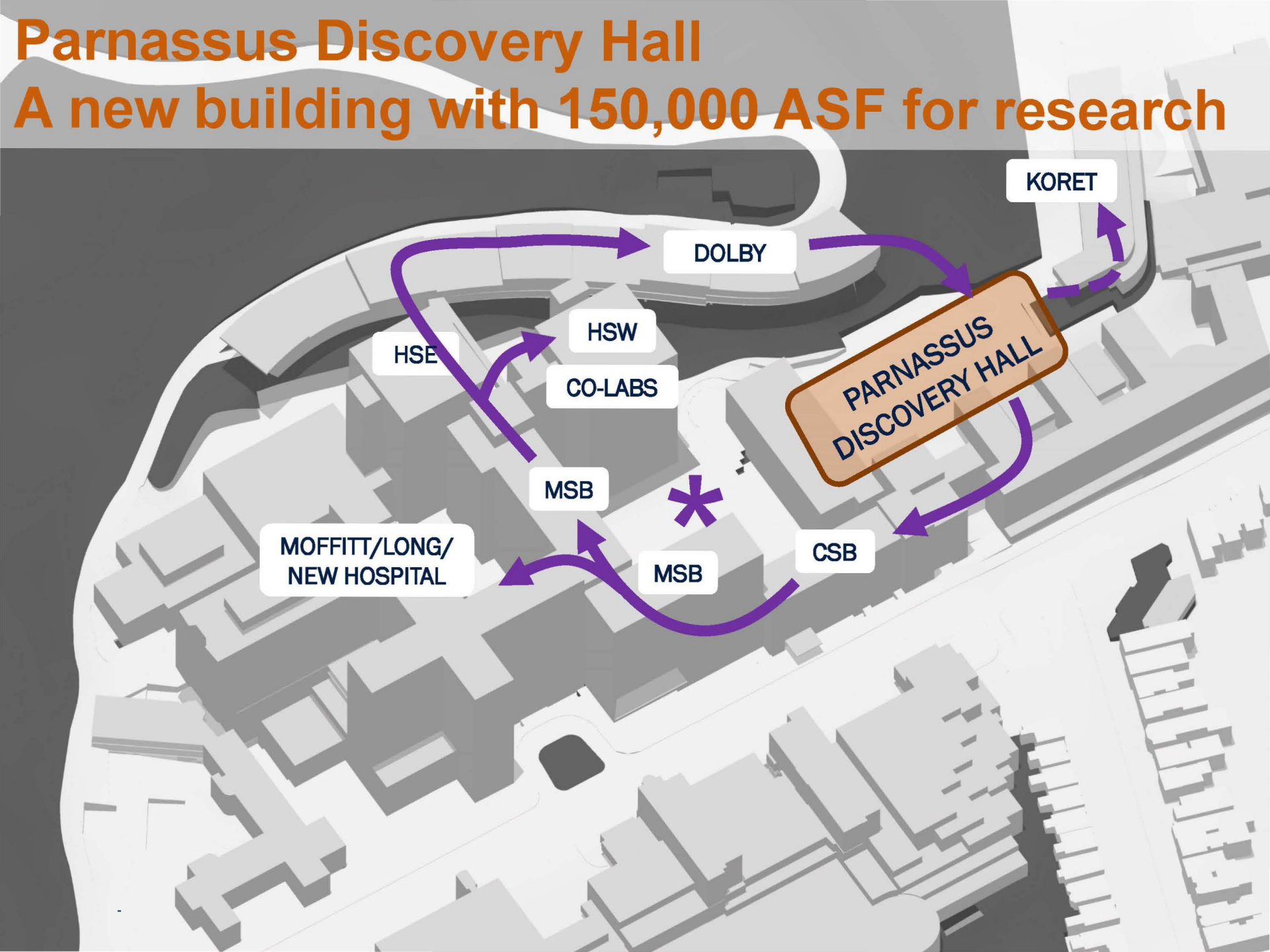
3. Mindful of unique space needs of each type of researcher.

4. Inclusive and transparent mechanism to solicit input from the research community on space design and adjacencies.

Parnassus Discovery Hall
A new building with 150,000 ASF for research

- A **large, modern, and inspiring** new research building to be a **centerpiece** for the rejuvenated Parnassus Heights
- **Speed** of implementation is a crucial design factor
- **Centrally located** near Saunders Court
- Focus on basic and translational science – **wet lab space** with modern space for cores and animal research
- **Near term flexibility** to facilitate renovation of existing research buildings.
- **Physically connected** to other PH research buildings (i.e. concourses to Dolby).

Parnassus Discovery Hall
A new building with 150,000 ASF for research



Parnassus Discovery Hall
A new building with 150,000 ASF for research

Programmatically connected

- Innovation thrives with fluid boundaries and self-assembled collaborative networks at UCSF
- Create space that encourages this prized aspect of our community
- Focus on interdisciplinary programs nucleated by faculty from multiple departments
- Grow existing world-class research programs
- Create space for emerging programs

Center for Innovative Medicine (75,000 ASF)

Research space for patient-facing clinical research

- A home for **patient-facing clinical research** at PH (cohort studies, clinical trials, mechanism-oriented clinical research).
- **Located on Parnassus** (adjacent to Helen Diller Hospital).
- Accommodating 12 investigator-led **clinical research units (CRUs)**

  - customized to needs of investigator groups
  - desks for coordinators, program managers, data managers
  - study rooms (visits, procedures)
  - storage (supplies, records).

- Space for **shared needs** – greeting, waiting, phlebotomy, training, compliance, seminars, communication, recruitment.

UCSF Center for Innovative Medicine
A home for clinical research (75,000 ASF)

Center For Innovative Medicine

Cohort Studies, Clinical Research, & Clinical Trials

12 Investigator Led CRUs

Investigator-led units of groups (coalitions) of 5-10 investigators. Modeled on the Multidisciplinary Clinical Research Unit and the Airway Clinical Research Center.

Complex Clinical Trials Unit

Shared Resources for Training, Compliance, Recruitment, Other

UCSF Center for Innovative Medicine
A home for clinical research (75,000 ASF)

Center For Innovative Medicine

Cohort Studies, Clinical Research, & Clinical Trials

12 Investigator Led CRUs

Investigator-led units of groups (coalitions) of 5-10 investigators. Modeled on the Multidisciplinary Clinical Research Unit and the Airway Clinical Research Center.

Complex Clinical Trials Unit

Shared Resources for Training, Compliance, Recruitment, Other

"..actual clinical research activities (such as participant recruitment, interviews, etc.) take place in clinical areas, typically occupying a room that could otherwise be used for clinical work. And often that clinical work (not inappropriately) takes precedence, cutting short research participant interaction".

Greg Marcus, M.D.,
Director of Clinical Research
UCSF Cardiology

UCSF Center for Innovative Medicine
A home for clinical research (75,000 ASF)

Center For Innovative Medicine

Cohort Studies, Clinical Research, & Clinical Trials

12 Investigator Led CRUs

Investigator-led units of groups (coalitions) of 5-10 investigators. Modeled on the Multidisciplinary Clinical Research Unit and the Airway Clinical Research Center.

Complex Clinical Trials Unit

Shared Resources for Training, Compliance, Recruitment, Other

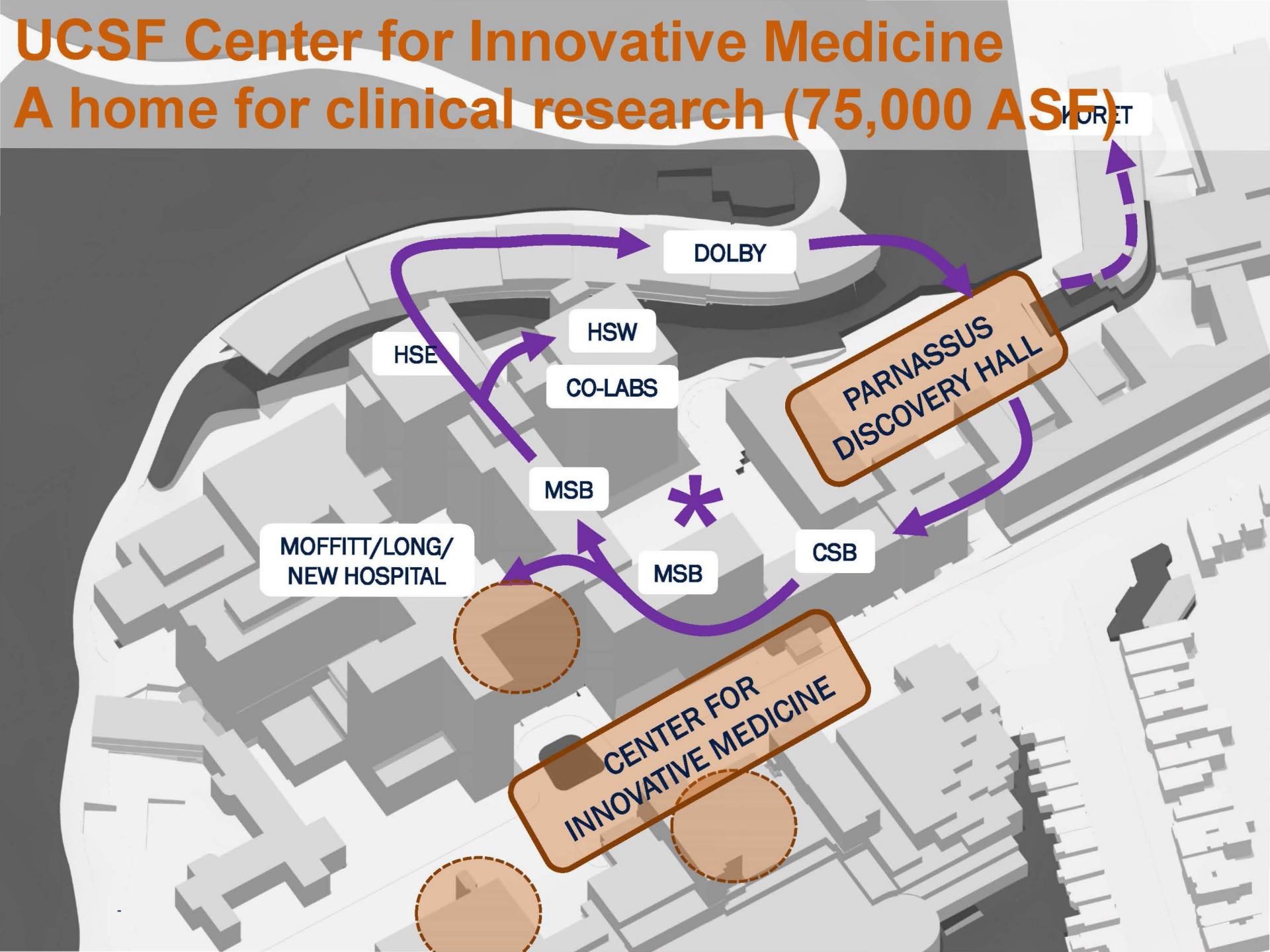
Other proposed clinical research infrastructure for PH

(i) Designated research areas in the new hospital (some shared with education ("*Designated academic areas*")

(ii) Overnight stay clinical research unit (OSCRU)

(iii) Right sized Investigational Drug Pharmacy (IDP)

UCSF Center for Innovative Medicine
A home for clinical research (75,000 ASF)



Center for Innovative Medicine
75,000 ASF for patient facing research

1. **Provides currently missing clinical research infrastructure**

1. **Fosters clinical research**

    - showcases UCSF research; encourages patient participation
    - attracts trainees to careers in clinical research
    - builds community among CRCs.

3. Allows **links** between CRUs and basic & translational programs:

    - fosters disease biology research & multidisciplinary research
    - strengthens grant applications (PO1s, P30s, CTSI).

4. Enables Helen Diller Medical Center to position for **innovation.**

Recommendation 1

Expand and transform the PH research campus to meet the urgent needs of current and future research programs.

TWO PHASE APPROACH

Phase 1 (Immediate, near term):

- **Construct** cores and a new research building with 150,000 ASF for research to accommodate growth of existing programs and development of new programs.

- **Construct** a clinical research building with 75,000 ASF as a Center for Innovative Medicine.

- **Renovate** the main research buildings (HSIR East and West, Medical Sciences) to modern gold-standard research space.

Phase 2 (Medium term):

- **Build** 100,000 ASF of additional research space to meet the ongoing needs of strong and emerging research programs.

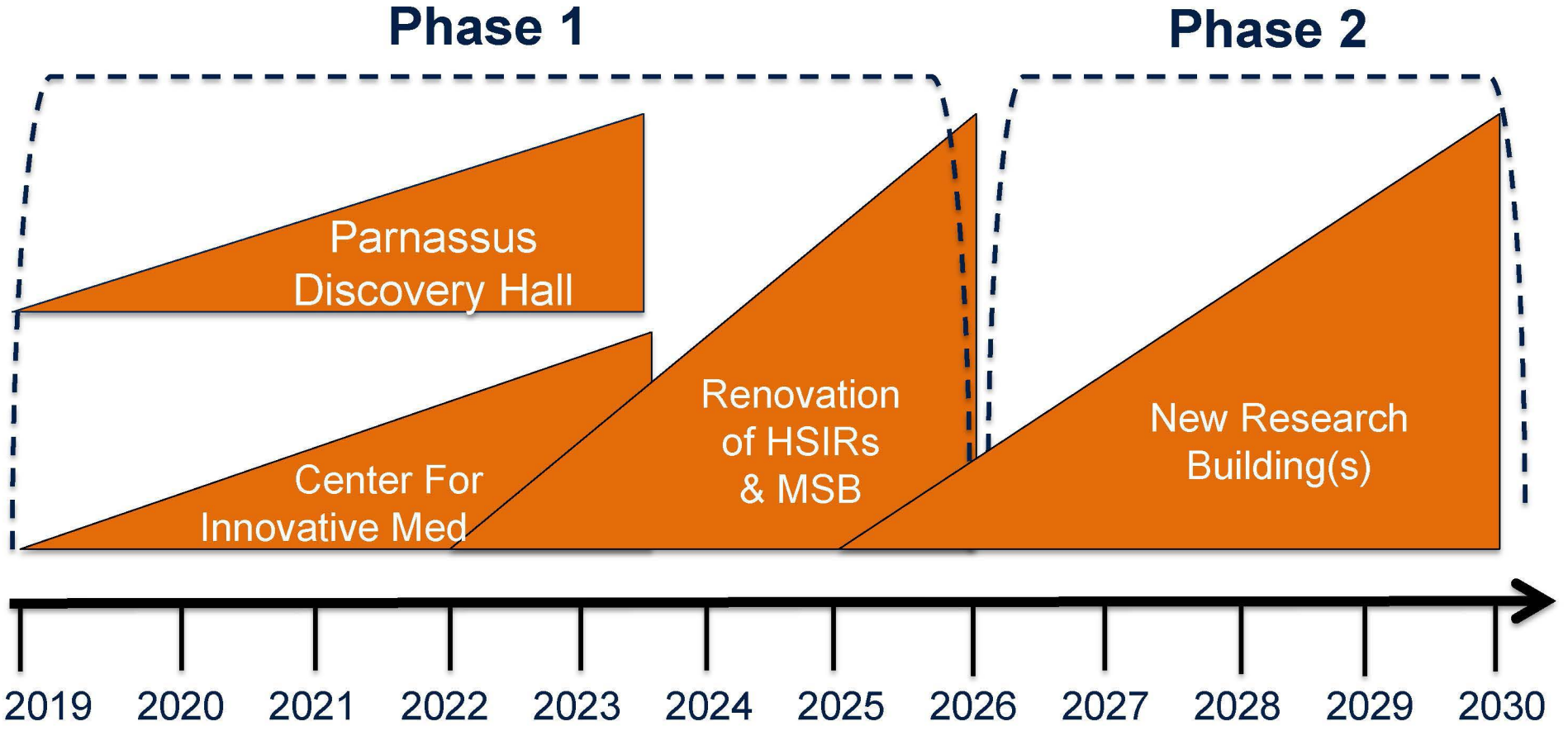
Phase 2: (Medium term)
100,000 ASF of additional research space

1. Allow for growth of the PH research enterprise (basic, translational, clinical, population).

2. Provide flexibility for research space that meets future research needs, with new programs across the research spectrum and in emerging disciplines, i.e. AI.

3. New space should be centrally located, connected to other research functions, and foster programmatic research interactions

Quickly Realizing the new UCSF-PH Research Campus



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Recommendation 2

What kind of research space does PH need?

Recommendation 2

Create inspiring research space with adjacencies and design elements that spur connectivity, community, innovation, and celebration.

(i) **Connectivity:** Center research space activities around Saunders Court.

(ii) **Community:** Create physical and digital connectivity, thoughtful adjacencies, and inviting, right-sized, formal and informal interaction spaces to overcome disciplinary and geographic boundaries.

(iii) **Innovation:** Co-locate programmatic research groups with critical mass in high quality space that is designed and allocated using inclusive and transparent mechanisms.

(iv) **Celebration:** Attract and inspire researchers and partners by celebrating UCSF science with art, architecture, and natural beauty.

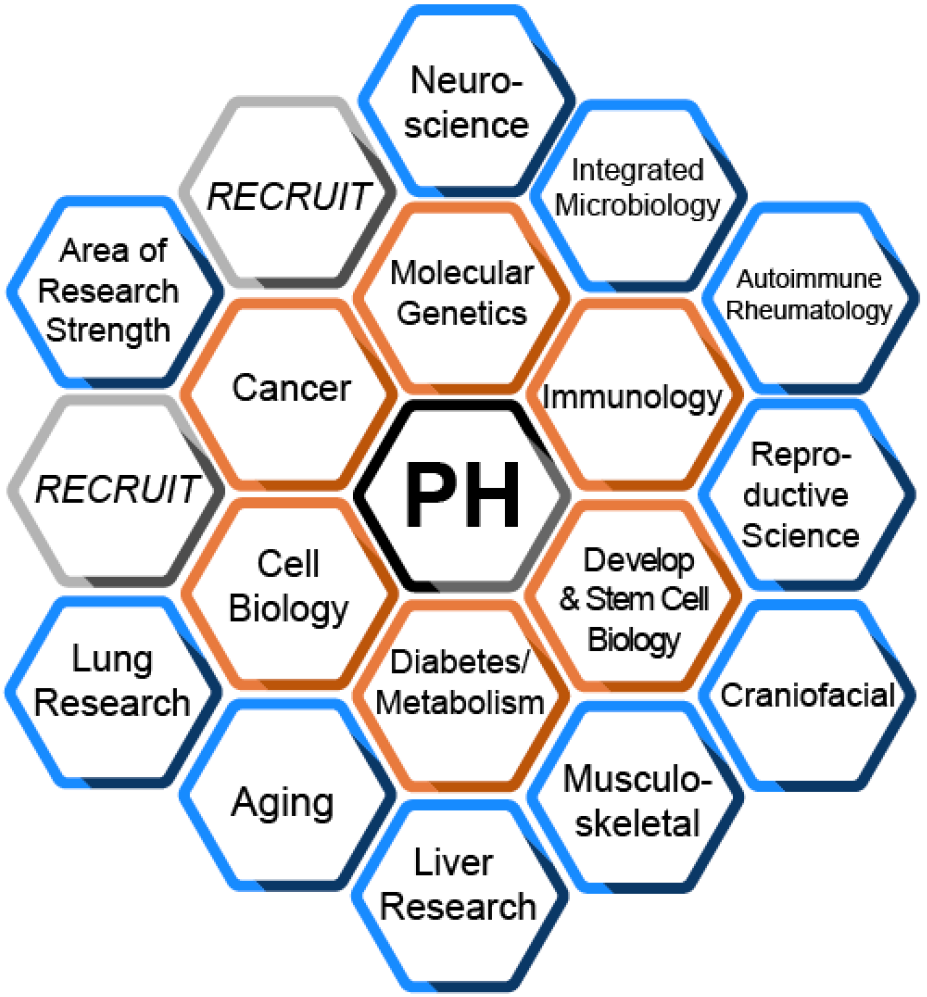
Integration of the PH Research Enterprise Basic Science Programs

Challenge: What are the research space needs of each critical mass of researchers?

One size does not fit all.

Disciplines: research areas with the most PH investigators that integrate all PH researchers

Topics: research areas with a critical mass of PH investigators



*Research Survey for PH basic scientists with 50%+ effort: "Please list 2 you identify with most and would like to be collocated with." Survey data supported by funding, Centers, ORUs, and conversations.

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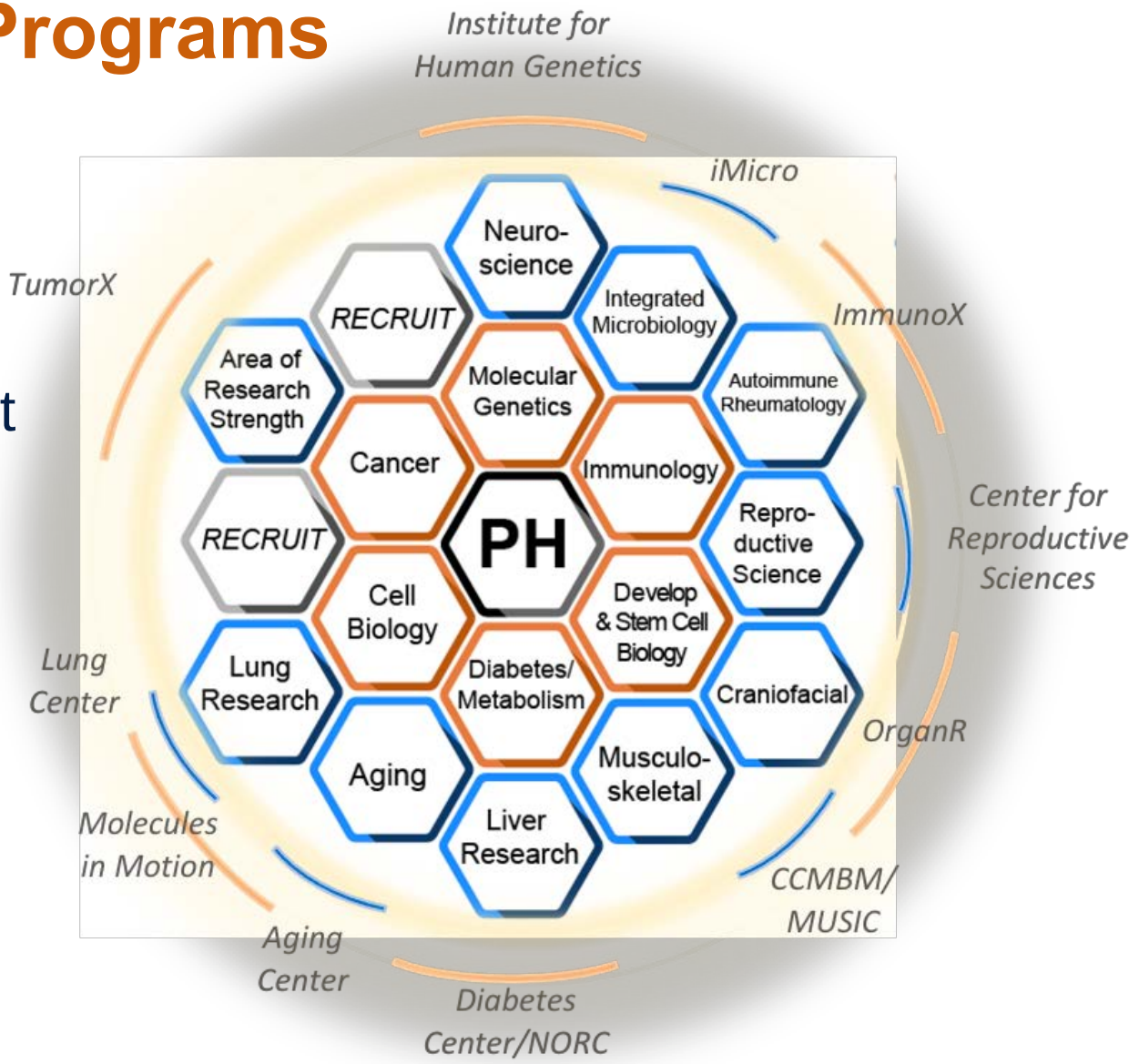
Integration of the PH Research Enterprise Basic Science Programs

- Programs, Centers, ORUs, and Cores support PH research.
- The same model applies to other types of research.



*For illustration purposes, many other Programs, Centers, ORUs, and Cores are not shown here.

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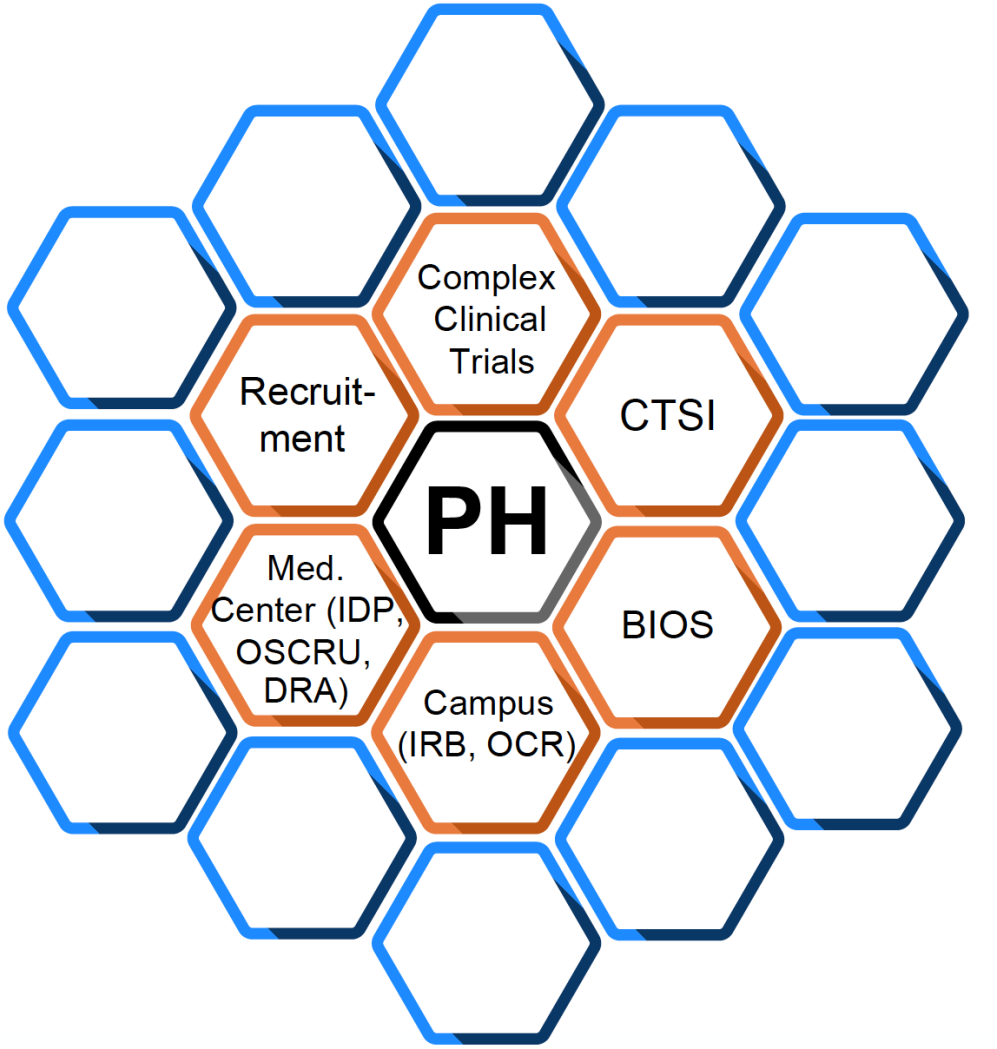
Integration of the PH Research Enterprise Clinical Research Programs



Investigator led clinical research units in the Center for Innovative Medicine

Centralized Services For Clinical Research

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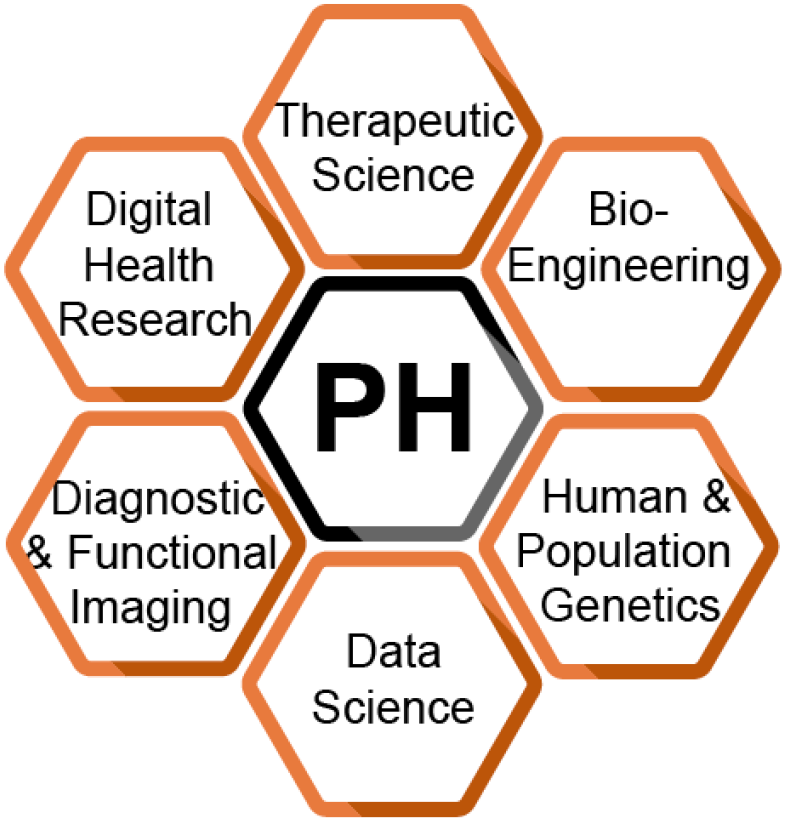
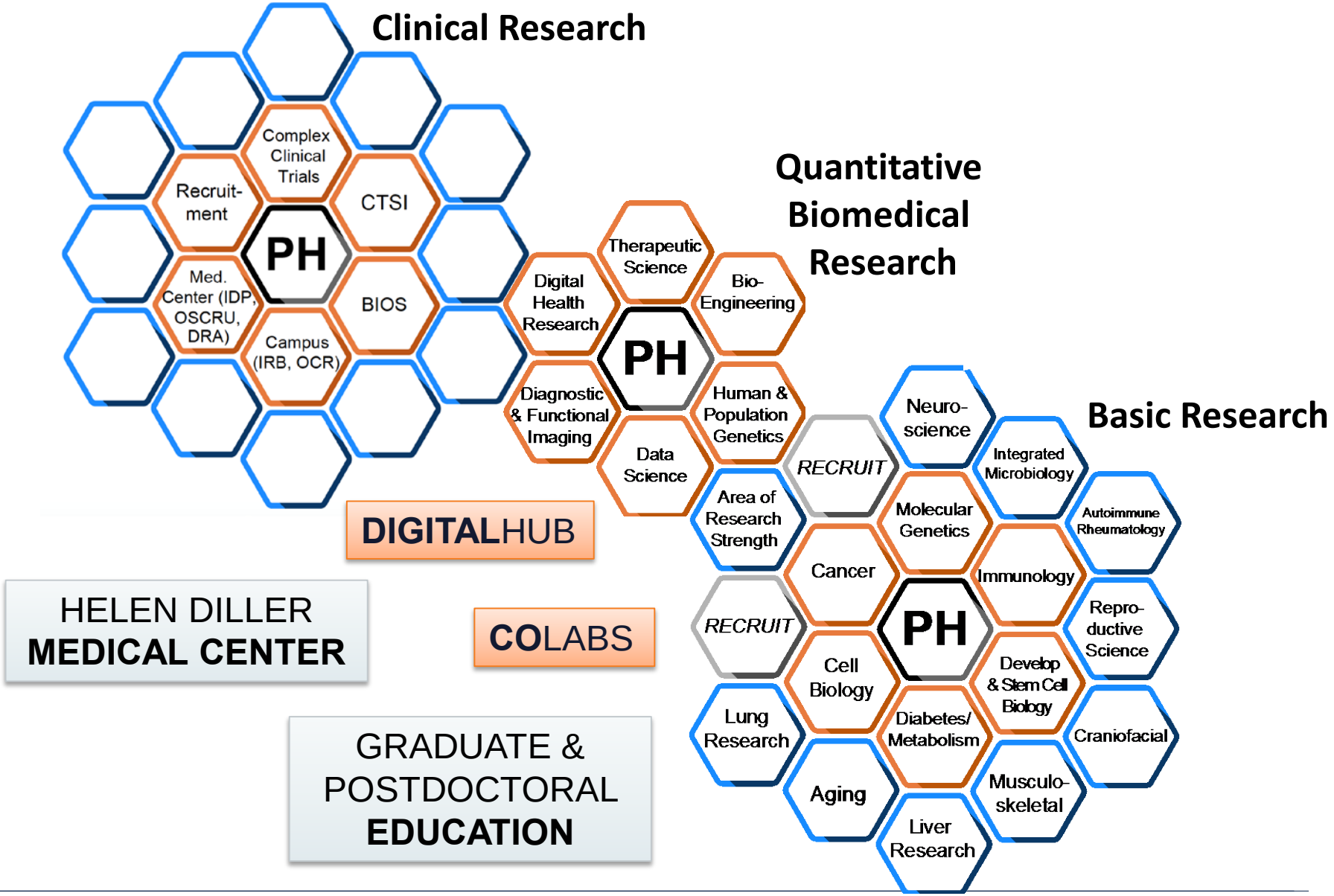
Integration of the PH Research Enterprise Quantitative Biomedical Research

- Some groups are currently below critical mass.
- Disperse investigators (many schools, departments, disciplines, and buildings).
- Strategic investment will augment PH fundamental and clinical impact.
- Aligned with Precision Medicine Initiative
- Additional outreach still needed.



Integration of the PH Research Enterprise



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Summary and Conclusions

UCSF PH Research

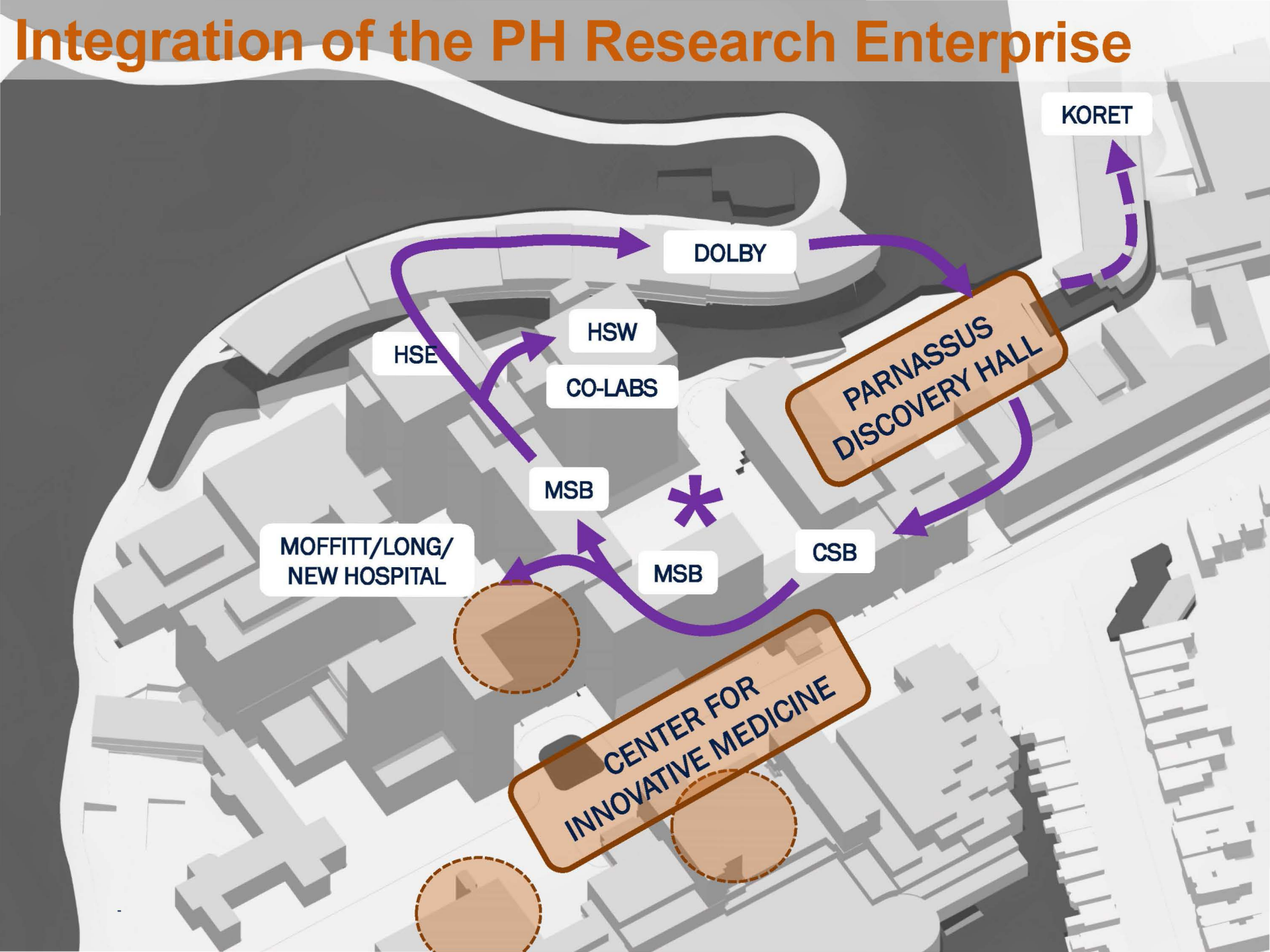
A world class and thriving enterprise

Multi-faceted strength across research disciplines, including basic, clinical, translational and computational.

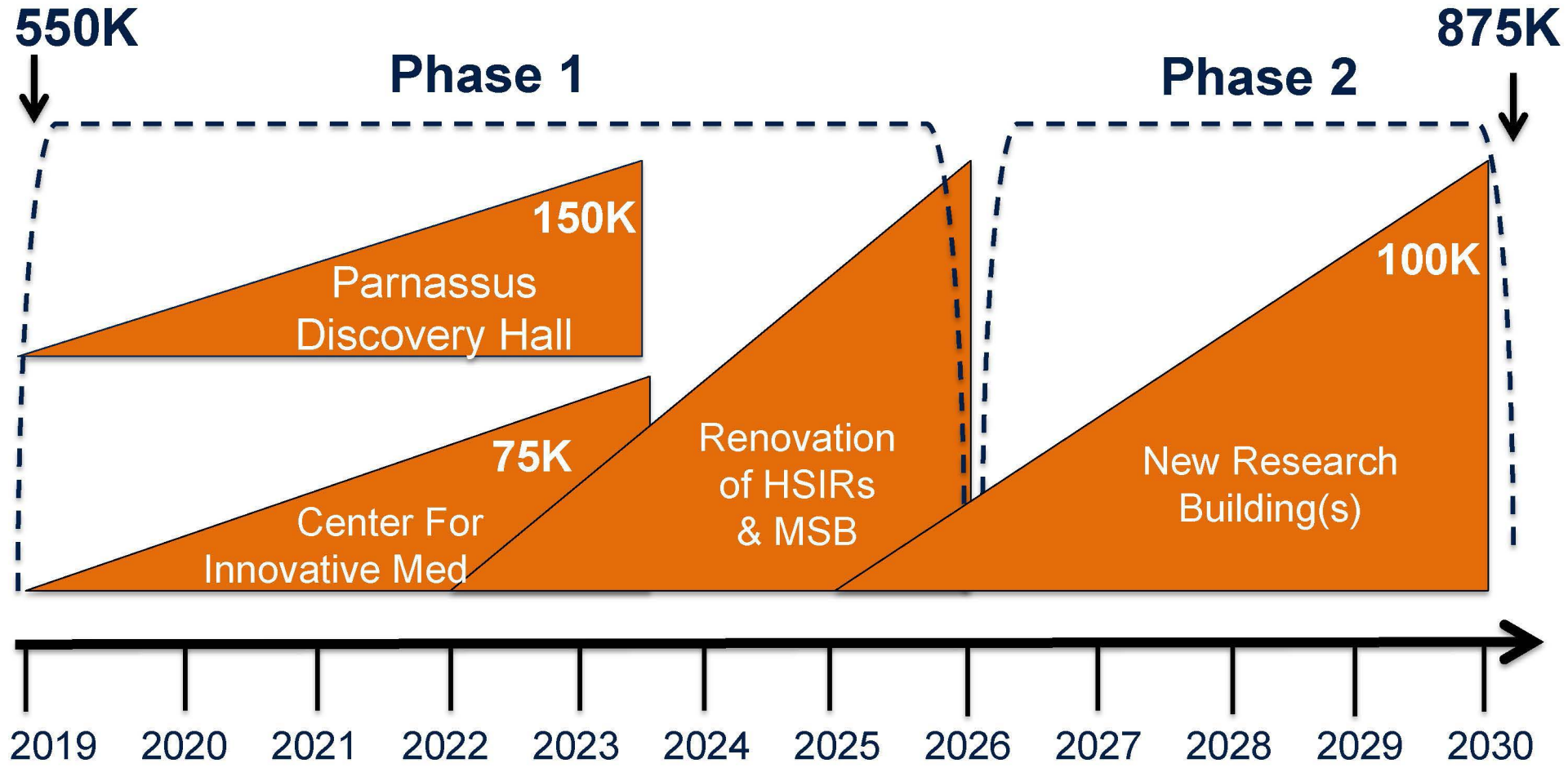
The new Helen Diller Medical Center and PMP process sparks a unique opportunity to create **transformative new space for research and discovery** that will:

- Realize the potential of outstanding PH research programs
- Pioneer clinical research infrastructure and innovation
- Cultivate exciting new research programs
- Advance a vision for impactful integrated research
- Attract and retain talented faculty and trainees

Integration of the PH Research Enterprise



Quickly Realizing the new UCSF-PH Research Campus



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Appendix

Current PH Research Enterprise
Basic Science Programs

	Basic Science Research Programs	Representatives
1.	Cancer	Jay Debnath, Andrei Goga, Jeroen Roose, Valerie Weaver
2.	Cell Biology	Bassem Al-Sady, Rushika Perera, Noelle L'Etoile, Fred Chang, Sophie Dumont, Diane Barber
3.	Developmental & Stem Cell Biology	Licia Selleri, Holger Willenbring, Sarah Knox
4.	Diabetes/Metabolism	Matthias Hebrok, Christian Vaisse
5.	Immunology	Matthew Krummel, Jeroen Roose, Jason Cyster, Mark Ansel, Mark Anderson
6.	Molecular Genetics	Neil Risch, Ophir Klein, Nadav Ahituv, Kathy Giacomini
7.	Aging	Saul Villeda, Andrew Brack
8.	Autoimmune/Rheumatology	Mary Nakamura, Lindsey Criswell
9.	Craniofacial	Ophir Klein
10.	Integrated Microbiology	Joanne Engel, Anita Sil
11.	Liver	Jacquelyn Maher, Holger Willenbring
12.	Lung	Mark Looney, John Fahy
13.	Musculoskeletal	Edward Hsiao, Rich Schneider, Jeffrey Lotz
14.	Neuroscience	Arnold Kriegstein, Arturo Alvarez-Buylla, Daniel Lim
15.	Reproductive Sciences	Marco Conti

Current PH Research Enterprise Clinical Science Programs

UCSF PH-Based Clinical Research Groups Engaged in Patient-Facing Clinical Research (Cohort Studies, Mechanism-Oriented Research in Human Subjects, Clinical Trials)				
Group	**Research Areas**	**Investigators[a]**	**Funding** *(ICR+TDC, 2016-17)*	**Approx# of CRCs[b]**
Oncology	(i) Heme Malignancies (ii) Immuno-Oncology	P Sayre, L Fong, P Munster, N Shah, J Rubenstein, T Martin, C Andreadis, C Smith, E Bergsland, A Logan, W Ai, G Mannis, L Kaplan, R Olin, L Damon, J Wolf, S Wong	$19.6MM	25
Surgery and Surgical Subspecialty	(i) Liver Transplant (ii) Kidney Transplant (iii) Pancreas & Pancreatic Islet Transplant (iv) HIV Transplantation (v) Treg immunology (vi) Thyroid disease & cancer (vii) Thoracic (lung cancer) (viii) Lung Transplant (ix) Vascular (aneurysms, peripheral artery disease) (x) Urology (prostate cancer) (xi) Cardiac Surgery (xii) Otolaryngology (head & neck cancer, polyps, sinusitis) (xiii) Hernias (xiv) Geriatric surgery	JA Sosa, H Harris, J Kukreja, M Conte, S Feng, P Stock, F Vincenti, C Freise S Kang, J Roberts, A Posselt, Q Tang, H Willenbring, M Sarwal, G Roll, S Syed, E Finlayson, C Lebares, D Jablons, G Wieselthaler, J Kratz, C Eichler, L Reilly, J Hiramoto, P Carroll, A Tward, S Pletcher, A Goldberg	$13.8MM	15
Lung	(i) Airway Diseases (asthma, COPD, CF) (ii) Interstitial Lung Diseases & Sarcoidosis (iii) Acute lung injury (iv) Lung Transplant	J Fahy, P Woodruff, M Matthay, H Collard, C Calfee, P Wolters, L Koth, J Golden, S Lazarus, S Christenson, E Gordon, N Bhakta, M Peters, B Ley, J Singer, J Gotts, *K Liu*	$12.0MM	15
Symptom Science	(i) Chemotherapy-induced peripheral neuropathy (CIPN), tinnitus, deafness (ii) Lymphedema in breast cancer survivors (iii) Bioethics (iv) Exercise & weight loss	C Miaskowski, J Levine, *S Chung*, M-O Kim, M Schumacher, G Abrams, K Topp, A Olshen, K Kober, B Smoot, B Koenig, C Dawson-Rose, Y Fukuoka, G Dowling, J Johnson, C Stephens, S Weiss, A Alkon, C Leung, D David, M Pelter	$8.3MM	16*
Neurological Surgery (Speech)	(i) Sensors/implants (ii) Deep brain stimulation	E Chang, S Nagarajan	$7.1MM	4
Center for Cerebrovascular Research	(i) Stroke trials (ii) Intracranial aneurysms AVMs, & atherosclerosis (iii) Pulsatile tinnitus (iv) Medical device trials	H Kim, N Ko, W Smith, K Meisel, A Kim, C Halabi, D Saloner, M Amans, S Hetts, D Cooke, A Abla, C Hess, X Hu (anesthesia, neurology, radiology, neurosurgery, nursing)	$6.0MM	10

[a]Names italicized for those whose funding is handled by a different department, thus not included in group funding total.

[b]Asterisk for CRCs counts pulled solely from HR database of active employees in CRC job family at PH

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Current PH Research Enterprise Clinical Science Programs

UCSF PH-Based Clinical Research Groups Engaged in Patient-Facing Clinical Research (Cohort Studies, Mechanism-Oriented Research in Human Subjects, Clinical Trials)				
Group	**Research Areas**	**Investigators[a]**	**Funding** *(ICR+TDC, 2016-17)*	**Approx# of CRCs[b]**
Health Disparities / Internal Medicine	(i) Cancer control and prevention (ii) Tobacco control (iii) Health disparities	L Karliner, A Huang, P Ling, T Nguyen, C Kaplan, R Gonzales, J Walsh-Cassidy, V Yank, M Feldman	$5.9MM	14*
Cardiology	(i) Arrhythmias (ii) Heart Failure (iii) Cardiac Imaging (iv) General & Interventional Cardiology (v) Adult congenital heart disease (vi) Health eHeart Study; (vii) Eureka platform	J Olgin, G Marcus, T DeMarco, M Aras, L Klein, R Abraham, M Albert, F Delling, B Lee, R Lee, V Mahadevan, J Moss, R Redberg, N Schiller, M Scheinman, V Selby, E Stock, E Weiss, E Gerstenfeld, G Fung, N Parikh	$5.7MM	20
Nephrology	(i) Chronic kidney disease (ii) Kidney transplant (iii) Acute kidney injury (iv) Hypertension (v) Polycystic kidney disease	K Liu, K Johansen, D Tuot, M Lunn, M Park, C Hsu, R Hsu, E Ku, R Dubin, C Peralta, M Estrella, A Webber, S Gluck, S Kung, *F Vincenti*	$5.6MM	8
Rheumatology / Autoimmune Disease	(i) Rheumatoid arthritis (ii) Lupus (iii) Vasculitis (iv) Scleroderma (v) Ankylosing spondylitis	L Criswell, M Dall'Era, P Katz, J Graf, M Nakamura, C Ye, F Boin, C Lanata, J Ashouri, L Gensler, R Nayak, G Schmajuk, J Yazdany, S Chung	$4.9MM	12
GI	(i) Hepatitis (ii) Inflammatory bowel disease (iii) Steatohepatitis (iv) Acute liver injury	J Maher, M Khalil, J Baron, B Hameed, U Mahadevan, J Lai, M Peters, J Price, D Bissell, N El-Nachef, D Brandman, M Sarkar, F Yao, N Mehta, M Arain	$4.6MM	20*
Diabetes	(i) Diabetes management (ii) Obesity (iii) Pancreas & pancreas islet transplantation	U Masharani, S Koliwad, M Anderson, *P Stock*	$4.2MM	3*
Neurological Surgery (Brain Tumor Center - Medical and Surgical Neuro-Oncology)	(i) Tumors (brain, spine, & PNS; metastases) (ii) Immuno-oncology (iii) Neurofibromatosis & meningiomas (iv) Novel medical and surgical therapies	N Butowski, J Clarke, J Taylor, N Oberheim-Bush, S Chang, M Berger, M Aghi, M McDermot, S Jumper, P Larson, *C Christine*	$3.9MM	21

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Current PH Research Enterprise
Clinical Science Programs

UCSF PH-Based Clinical Research Groups Engaged in Patient-Facing Clinical Research (Cohort Studies, Mechanism-Oriented Research in Human Subjects, Clinical Trials)				
Group	**Research Areas**	**Investigators[a]**	**Funding** *(ICR+TDC, 2016-17)*	**Approx# of CRCs[b]**
Anesthesia	(i) Critical care (e.g.: ARDS, sepsis) (ii) Organ transplantation (iii) Perioperative medicine and outcomes (iv) Neuromuscular blockade (v) Pain	M Gropper, J Leung, J Hellman, J Sall, J Ramsay, P Bickler, J Lee, A Prakash, J Feiner, C Lee, C Niemann, M Bokoch, K Kolodzie	$2.8MM	9*
Dentistry / ENT / Craniofacial Research	(i) Dental caries, composites, & implants (ii) Dental quality (iii) HIV related oral mucosal disease (iv) Sjogren's syndrome	S Ho, C Shiboski, E Kalenderian, T Lang, P Leake, J Houde, S Kapila, D Fried	$2.6MM	2
Geriatrics	(i) Dementia (ii) Disability (iii) Quality of Life	C Ritchie, M Steinman, K Covinsky, B Williams, J Newman, S Rogers, C Ahalt, M Greene, T Allison	$2.5MM	8
Infectious Disease	(i) Human papilloma virus (HPV)	J Palefsky, P Chin-Hong	$2.4MM	11
Dermatology	(i) Pemphigus vulgaris (ii) Scleroderma (iii) Inflammatory skin diseases	M Rosenblum, A Haemel, H Naik	$1.6MM	0*
Endrocrinology	(i) Metabolic bone disease	E Hsiao, M Rao	$1.5MM	6
Palliative Care	(i) Pain (ii) Advance care planning (iii) Ethics	S Pantilat, W Anderson, M Rabow, E Dzeng	$960K	0*
Hospital Medicine	(i) Quality improvement (ii) Implementation science (iii) Digital health (iv) Clinical informatics	M Fang, A Auerbach, K Kangelaris, J Harrison, S Shah, P Prasad, N Najafi, J Adler-Milstein	$491K	0*
Neurology	(i) Parkinson's disease (ii) Neuromuscular disease (iii) ALS studies (iv) Neuroprotection	M Aminoff, C Christine, *P Larson*, C Lomen-Hoerth	$266K	8*
Orthopaedics	(i) Spine disorders (ii) Intervertebral Disc Degeneration (iii) Bone Cancer	R O'Donnell, S Berven, V Deviren, S Burch, B Tay, L Metz, R Wustrack	$264K	9

[a]Names italicized for those whose funding is handled by a different department, thus not included in group funding total.

[b]Asterisk for CRCs counts pulled solely from HR database of active employees in CRC job family at PH

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Guiding Principles

1. World-class biomedical research campus - a magnet science community.

2. Blend of research activities - basic, clinical, translational - not dominated by any research category or program and with each research activity populated by a critical mass of faculty.

3. High quality shared research resources for both bench and clinical sciences.

4. Integration with the UCSF-PH clinical enterprise.

5. Inspiring interaction and research space intentionally designed to provide:

- high quality research space, co-location of collaborating researchers, and high quality shared space for community, collaboration and communication.

6. Secure space allocation that accommodates dynamic needs and opportunities, programmatically and scientifically.

UCSF
University of California
San Francisco

Central Research Labs (CRL)

PLAN PROPOSAL

CRL Subgroup Report to the
Parnassus Master Planning Steering Committee

April 27, 2018



2017 CHANCELLOR'S ANNUAL ADDRESS

State of the University

"Excellence"

"Now is the time to start"

"Impassioned engagement of the Parnassus Heights-based faculty"

"Incredibly exciting ideas"

"World-class modern facilities"

"Big and **bold**"



CRL SUBGROUP COMMITTEE

Mandate

- Design a **new model** for central lab resources
  - Capitalizes on **critical personnel** and **cutting-edge methods & technologies**
  - Drives **collaboration** across disciplines
- Produce high level plans for **contiguous space** housing all CRL components
  - Integrates core activities into one centralized place, *e.g.* sample processing, high-dimensional imaging, cell separation/sorting, genomic analysis
- Maximize **impact & engagement**
- Launch within a **2-year timeline**

CRL SUBGROUP COMMITTEE

Membership and Process



NADAV AHITUV, PHD
Bioengineering & Therapeutics



DIANE KAY
Space & Capital Planning



PATTI MITCHELL
Capital Programs



JIMMIE YE, PHD
Epidemiology & Biostatistics



VINCENT CHAN, PHD
Pathology



MAX KRUMMEL, PHD
Pathology



ELIZABETH SINCLAIR, PHD
Research Resource Program



KARIN WONG
Space Strategy



ERIC CHOW, PHD
Biochemistry & Biophysics



TIPPI MACKENZIE, MD
Surgery



MATTHEW SPITZER, PHD
Microbiology and Immunology



HUGH COTTER, AIA
Oculus Architects, Inc.



LINDSEY CRISWELL, MD, MPH
Medicine



ALEX MARSON, MD, PHD
Microbiology and Immunology



SAUL VILLEDA, PHD
Anatomy



DAVID ERLE, MD
Medicine



MICHAEL MCMANUS, PHD
Diabetes Center



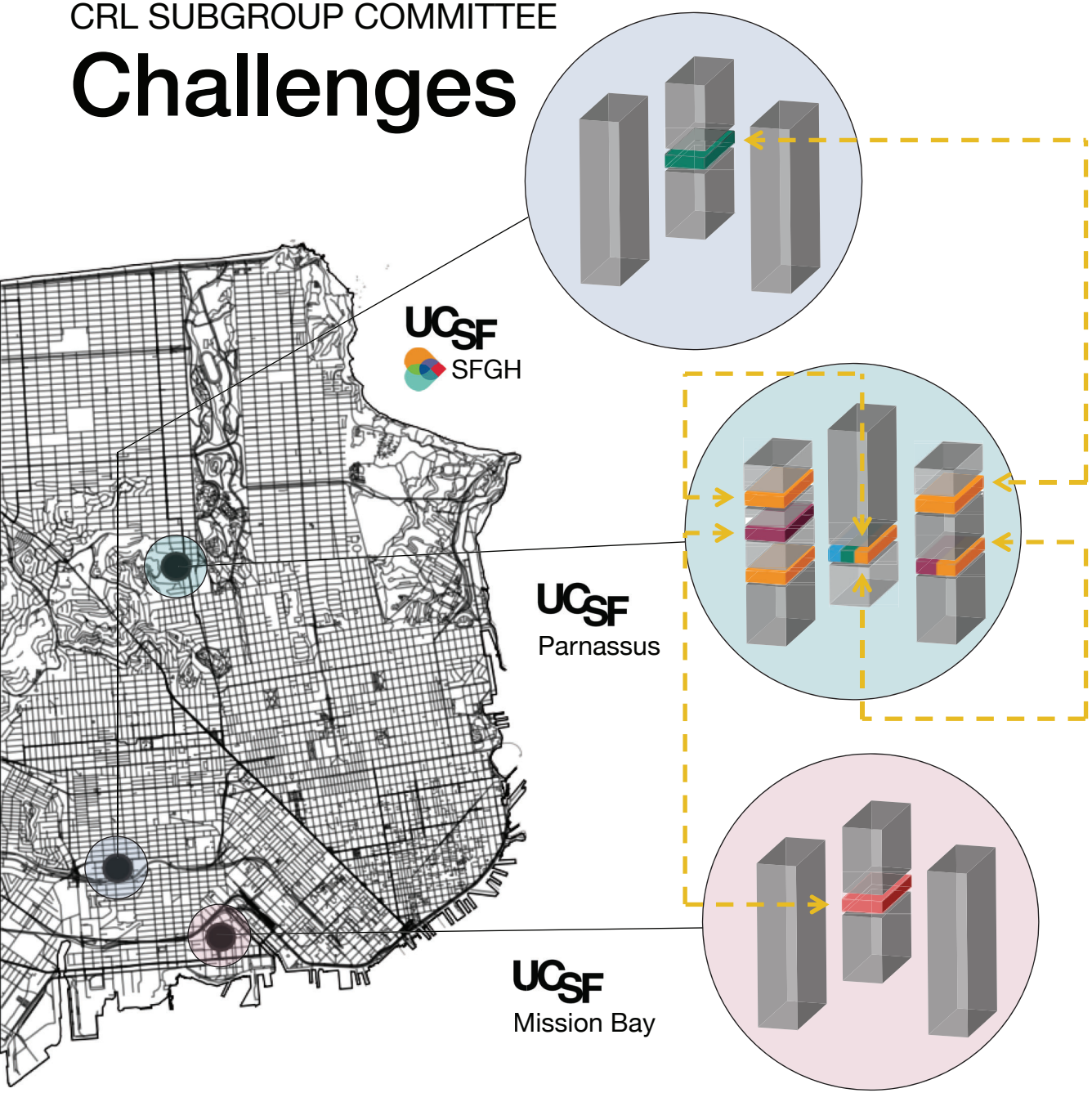
KATHERINE YANG, PHARMD, MPH
Clinical Pharmacy

SINCE JANUARY 2018:

- 5 committee meetings
- 7 task forces
- Website
- Email announcements
- Existing facility inventory
- Site visits

CRL SUBGROUP COMMITTEE

Challenges



- **Fragmented** facilities
  - Difficult to find and use cores
  - Limits collaboration and synergies
  - Inefficient use of space and equipment
- **Lagging investments** in transformative methods & technologies
  - Data sciences
  - Genomics
- **Unreliable** long-term financial support
  - Inefficiencies
  - Inadequate institutional support for cores (9% versus 27% nationally)
- **Retention** of world-class staff

CRL SUBGROUP COMMITTEE

Goals & Opportunities

- ## Rejuvenating Parnassus
  Complete promptly a **highly-visible model for developing big and bold initiatives** at Parnassus

- ## Building on Parnassus' strength
  Emphasize **Parnassus' unique strengths** by exploring the biological basis of disease in transformative new ways and by complementing resources available elsewhere

- ## Fostering collaboration
  Enhance a sense of community by moving beyond the traditional "core" model and facilitating the **communization of resources, expertise, and data**

- ## Creating excellence, responsiveness, and sustainability
  Recruit and retain **excellent people who are engaged and nimble** in recognizing emerging opportunities, and who can promote the sharing of ideas and tools developed in individual labs

- ## Supporting education and training

CRL SUBGROUP COMMITTEE

Vision



UCSF SFGH

UCSF Parnassus

UCSF Mission Bay

UCSF Parnassus

CRL SUBGROUP COMMITTEE

Design Concept

COLABS

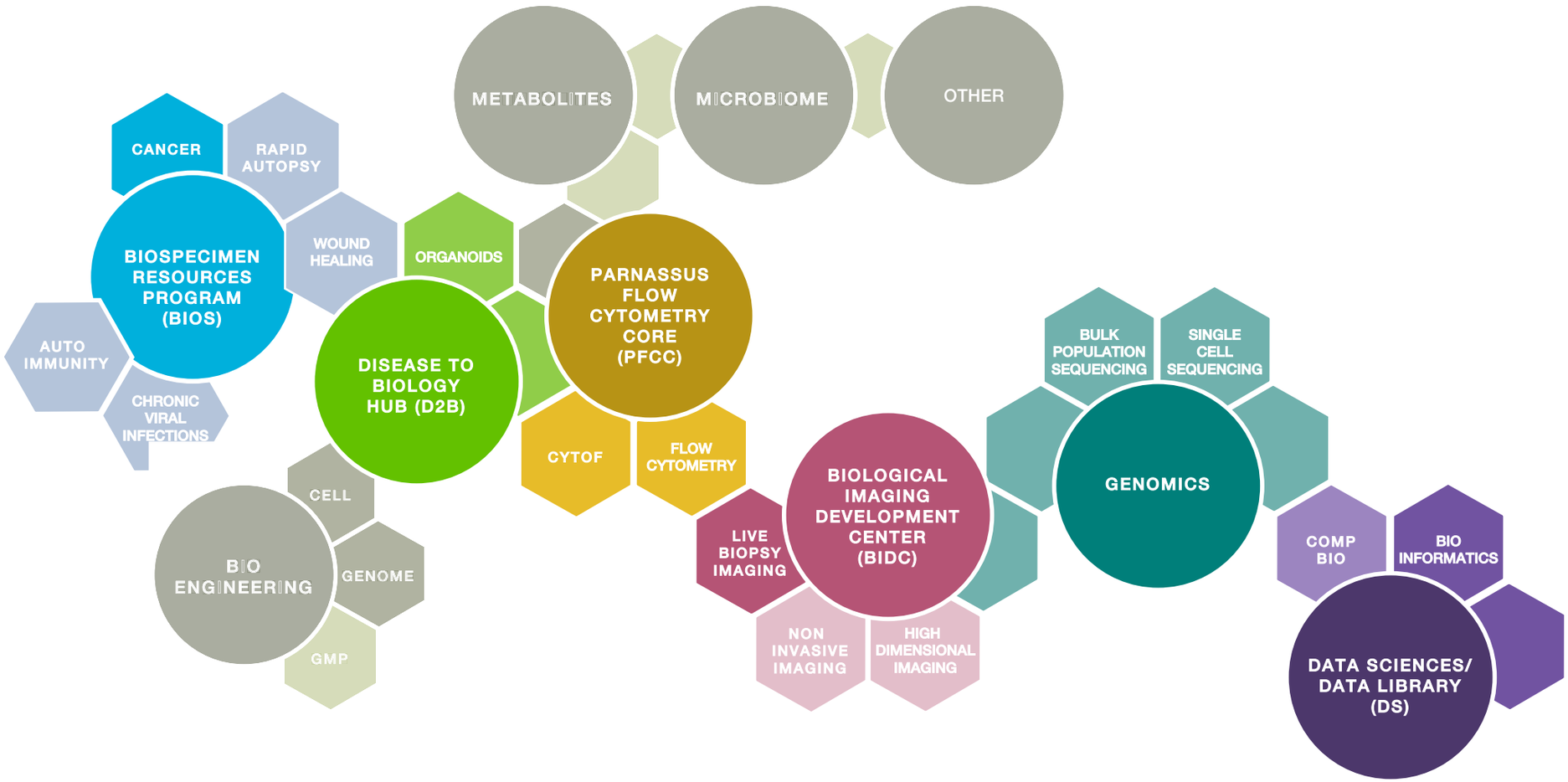
AT PARNASSUS

The “C” is a multi-faceted representation of CoLabs: as a logomark; as an interconnected space of shared labs; as an open “ring of collaboration” that will mirror the eventual rejuvenation and space concept at Parnassus.



CRL SUBGROUP COMMITTEE

CoLabs at Parnassus



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Benefits to Parnassus and UCSF

Dramatically lower barriers for interdisciplinary collaborations

- Allows access to sophisticated approaches essential for cutting-edge science
- Especially important for early stage investigators and clinical-scientists

Drive more efficient use of costly sharable resources

- Reduce costs and need for space in other Parnassus projects that will follow
- Data sharing ensures maximizes benefits of patient-based research

Reduce glaring inequities between Parnassus and MB

- Improve Parnassus morale and build excitement about the future of Parnassus
- Decrease need to travel to MB for important services

Enable a new financial model

- Attract a broader range of funders
- Leverage large project funding to benefit the whole community

Provide a visible center for researchers at Parnassus

- Build a sense of community
- Provide new facilities and personnel for training and innovation

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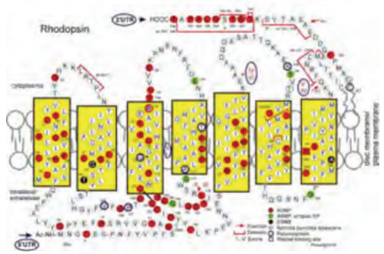
Single CoLab Use Case





Doug Gould, PhD and **Scott Oakes, MD** want to use gene editing to cure inherited forms of blindness. They are looking for mouse models for assessing the efficacy of editing a relevant target gene in the retina. Doug and Scott consult with Michael McManus who provides advice about suitable tools. They can develop the required transgene constructs in their own labs or travel to the MB Cell and Genome Engineering Core to work with them. For generation of transgenic mice from ES cells, Parnassus investigators can use either the Gladstone core or an off-campus service provider. Mice are then shipped to Doug and Scott, who genotype them and deliver some mice to the LARC Rederivation Core for preservation. Therapeutic CRISPR AAVs can be produced with help from the UCSF ViraCore.





BIOLOGICAL IMAGING DEVELOPMENT CENTER

GENOMICS

DATA SCIENCES/ DATA LIBRARY

SINGLE COLAB PROJECT

Step 1. Doug and Scott work with the Genomics **CoLab** director to design the experiment, offering new technologies that raise impact and often save both time and money.

Step 2. The Genomics **CoLab** performs ES gene targeting, microinjects ES cells, helps genotype animals and offers a phenotyping service via UCD liaison.

Step 3. The Genomics **CoLab** biobanks locally or with a UCD liaison.

Step 4. The Genomics **CoLab** produces the CRISPR AAV construct and coordinates with the ViraCore to produce therapeutic AAV.

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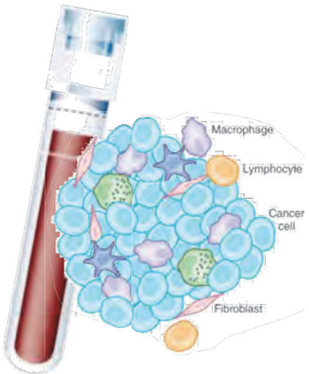
CoLabs Projects





Jocelyn Chapman, MD is keen to understand the immune diversity of gynecological tumors that she is obtaining in the clinic. Like many clinician-scientists, she does not have her own lab with the capacity to undertake this work. Instead, she is able to contribute tumor and blood specimens and a clinical research coordinator FTE to CoLabs.

BIOSPECIMEN RESOURCES PROGRAM

DISEASE TO BIOLOGY HUB

PARNASSUS FLOW CYTOMETRY CORE

BIOLOGICAL IMAGING DEVELOPMENT CENTER

GENOMICS

DATA SCIENCES/ DATA LIBRARY

COLABS PROJECT

Step 1. Jocelyn works with the **CoLabs** director to define pilot project of 12 ovarian samples in the pipeline. **BIOS** works with Jocelyn to identify, consent, and acquire tissue & blood from patients.

Step 2. **BIOS** transfers tissue & blood to **D2B** technician. **D2B** technician takes a tissue slice for H&E/IF and dissociates the rest; the technician also isolates PBMCs from blood.

Step 3. **D2B** technician works with **PFCC** personnel to reserve FACS, sort tumor/immune cells for multi-omic analyses, and runs several stain panels to understand the immune composition.

Step 4. **BIDC** personnel receives tissue slices from **D2B** technician and uses multiplexed IF imaging techniques and quantification methods to understand spatial interplay of tumor/immune cells.

Step 5. **Genomics** personnel receives sorted tumor/immune cells from **D2B** technician and isolates RNA & DNA for transcriptomic & genomic sequencing of tumor/immune compartments.

Step 6. **Bioinformaticians** receive, curate, and store all data (including clinical) in the **UCSF Data Library**, and work with Jocelyn to develop analytical tools to mine the ovarian tumor dataset. Data is “freed” to all UCSF investigators after set determined time.

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Impact on Researchers

Improve services for existing users of Parnassus cores

- **PFCC (Flow Cytometry)** 140 PIs
- **BIDC (Imaging)** 51 PIs, 19 departments
- **CTSI CRS Sample Processing Core** 59 PIs
- **IHG Core Single Cell RNA-seq** ~50 PIs
- **Parnassus Center for Advanced Technology** ~15 PIs
- **Immunoprofiler Flow/Sequencing and Allied Projects** ~25 PIs

Provide on-site access to key services now only available elsewhere

- **Nikon Imaging Center in Genentech Hall** 191 PIs, ~15% at Parnassus
- **Center for Advanced Technology in Genentech Hall** 150 PIs, ~15% at Parnassus
- **Transgenic Core at Gladstone** ~35 UCSF PIs, >50% at Parnassus
- **Functional Genomics Core in Rock Hall** 55 PIs, 49% at Parnassus
- **Clinical Immunology Lab at ZSFG** 27 PIs, all would benefit from access to PFCC

Unlock access to transformative technologies for existing and new users

- **Data sciences** for storage and analysis of large datasets (including genomics)
- New **imaging** and **single cell analysis** methods
- **Advanced gene editing** (CRISPR and beyond)
- **Massively parallel functional assays**

New User Access

New users can enter the CoLabs in one of several ways:

- **Direct access:**
  Access by interacting directly with the CoLabs Director. The new user will typically be the PI and the project will largely be managed by personnel determined by the Director.
- **Sponsored access:**
  Access through collaboration with an existing user (Sponsor). The project will largely be managed by personnel “linked” to the Sponsor’s existing project.
- **Recharge/subscription access:**
  Each CoLab will retain its traditional “core” capacities, *e.g.* daily users who use a single-piece of equipment

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CoLabs OrgChart

COLABS AT PARNASSUS

COLABS DIRECTOR

D2B
COLABS AT PARNASSUS

D2B STEERING COMMITTEE

D2B DIRECTOR

PFCC
COLABS AT PARNASSUS

PFCC STEERING COMMITTEE

PFCC DIRECTOR

BIDC
COLABS AT PARNASSUS

BIDC STEERING COMMITTEE

BIDC DIRECTOR

GENOMICS
COLABS AT PARNASSUS

GENOMICS STEERING COMMITTEE

GENOMICS DIRECTOR

DS
COLABS AT PARNASSUS

DS STEERING COMMITTEE

DS DIRECTOR

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D2B OrgChart

D2B: CENTRAL LABS



D2B STEERING COMMITTEE

D2B DIRECTOR

TISSUE PROCESSING LAB

- Franz Villaroel, PhD — Imaging-Specific Embed #1
- Clinician/Scientist TBD — Imaging-Specific Embed #2
- Arjun Rao, PhD — Data Science-Specific Embed
- Clinician/Scientist TBD — Flow-Specific Embed
- Alexis Combes, PhD — Embedded Scientist
- Kevin Barry, PhD — Embedded Scientist
- Amar Patel, MD — Embedded Clinician

Embedded Researchers

- Gabi Reeder — 100/20 Technician
- Karen Tolentino — 100/20 Technician
- Jasmine Sjarif — 100/20 Technician
- Evans Shao — 100/20 Technician
- Jessica Tsui — 100/20 Technician
- Joy Hsu — 100/20 Technician
- Arun Burra — 100/20 Technician

Technicians

ORGANOIDS LAB

- Michella Oghenekevwe — Organoids Lead
- Taymour Hammoudi, MD — Organoid-Specific Embed #1
- Clinician/Scientist TBD — Organoid-Specific Embed #2

Embedded Researchers

- Technician TBD — 100/20 Technician
- Technician TBD — 100/20 Technician

Technicians

EXPANSION PROJECTS

- Clinician/Scientist TBD — Mouse-Specific Embed
- Clinician/Scientist TBD — Embedded Scientist
- Clinician/Scientist TBD — Embedded Scientist
- Clinician/Scientist TBD — Embedded Scientist
- Clinician/Scientist TBD — Embedded Scientist

Embedded Researchers

- Technician TBD — Mouse Technician
- Technician TBD — 100/20 Technician
- Technician TBD — 100/20 Technician
- Technician TBD — 100/20 Technician
- Technician TBD — 100/20 Technician

Technicians

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Space Programming

01/ 02 wet labs - 31 knee holes



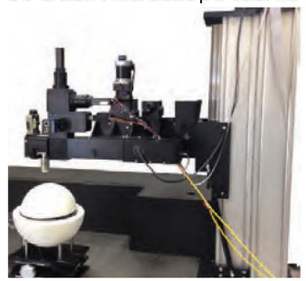
05/ 06 tissue culture rooms - 20 BSC



01 large shared microscope room



05 small microscope rooms



01 large flow cytometry room



01/ 02 equipment rooms



01/ 02 dry labs - 46 desks



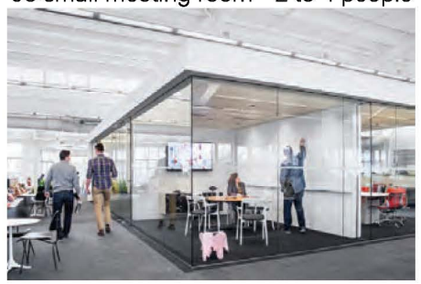
03 private offices - 3 desks



03 shared offices - 12 desks



06 small meeting room - 2 to 4 people



02 small conference rooms - 4 to 6 people



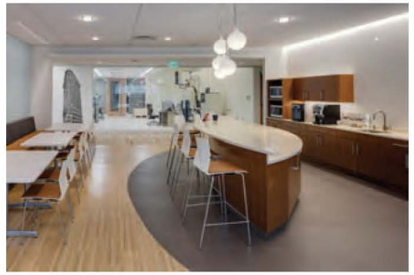
01 conference room - 12 to 16 people



01 seminar/ training room - 20 people



01/ 02 break rooms



Estimated program space needs:
19,251 SQFT

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Design Considerations

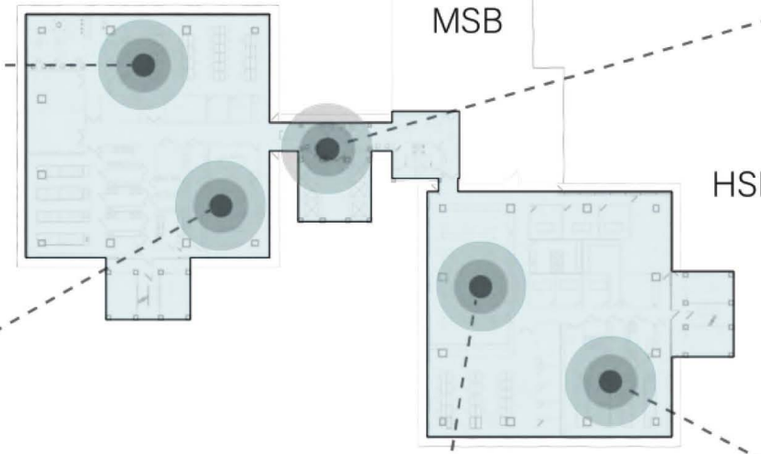
Collaborating



HSW

MSB

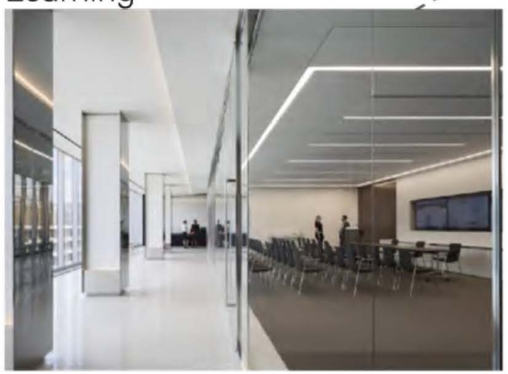
HSE



Socializing



Learning



Visual connection



Flexibility



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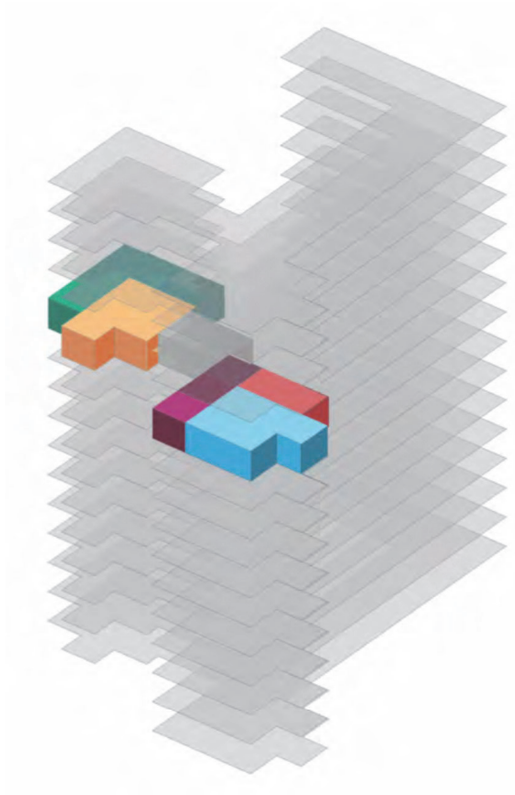
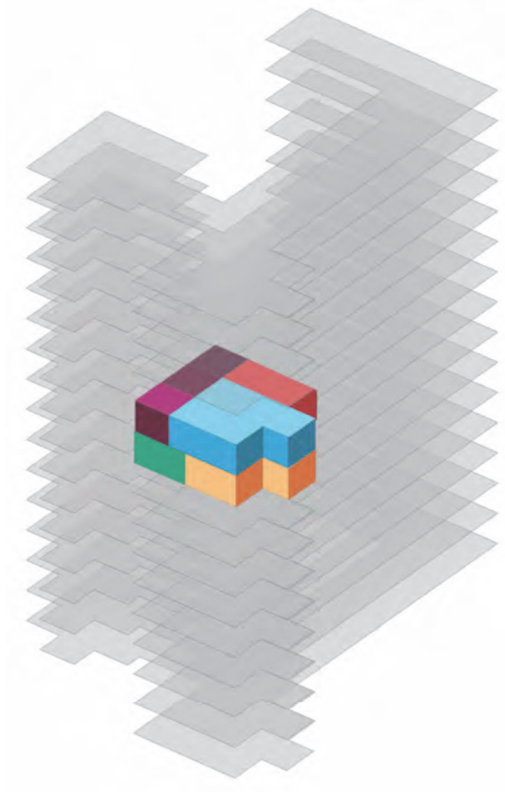
Space Options Considered

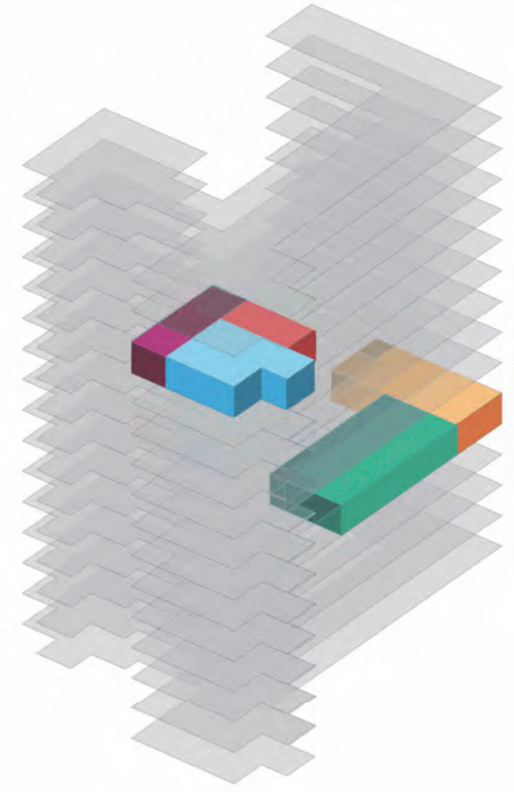
Adjacent



Stacked



Separated



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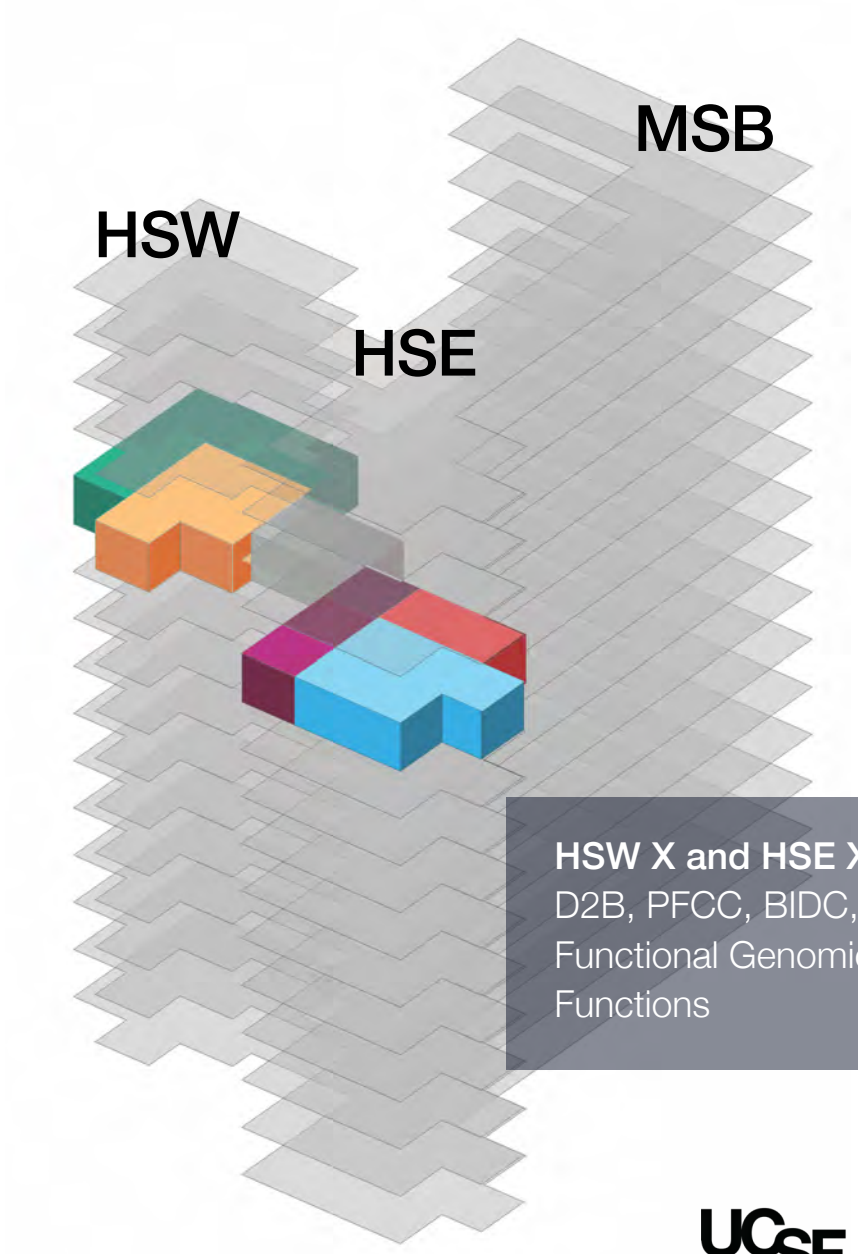
Space Options

Adjacent Floors

- **Pros**
  - Optimal for integration of all CoLabs
  - Maximizes chance “human collisions” designed to spark innovation and collaboration
  - Enables development of space between HSE & HSW for interaction area
  - Maximizes visibility of the CoLabs
- **Cons**
  - There are no HSIR levels with two floors (HSE & HSW) that are both in urgent need of renovation



HSW X and HSE X
D2B, PFCC, BIDC, Data Sciences, Functional Genomics, and Communal Functions

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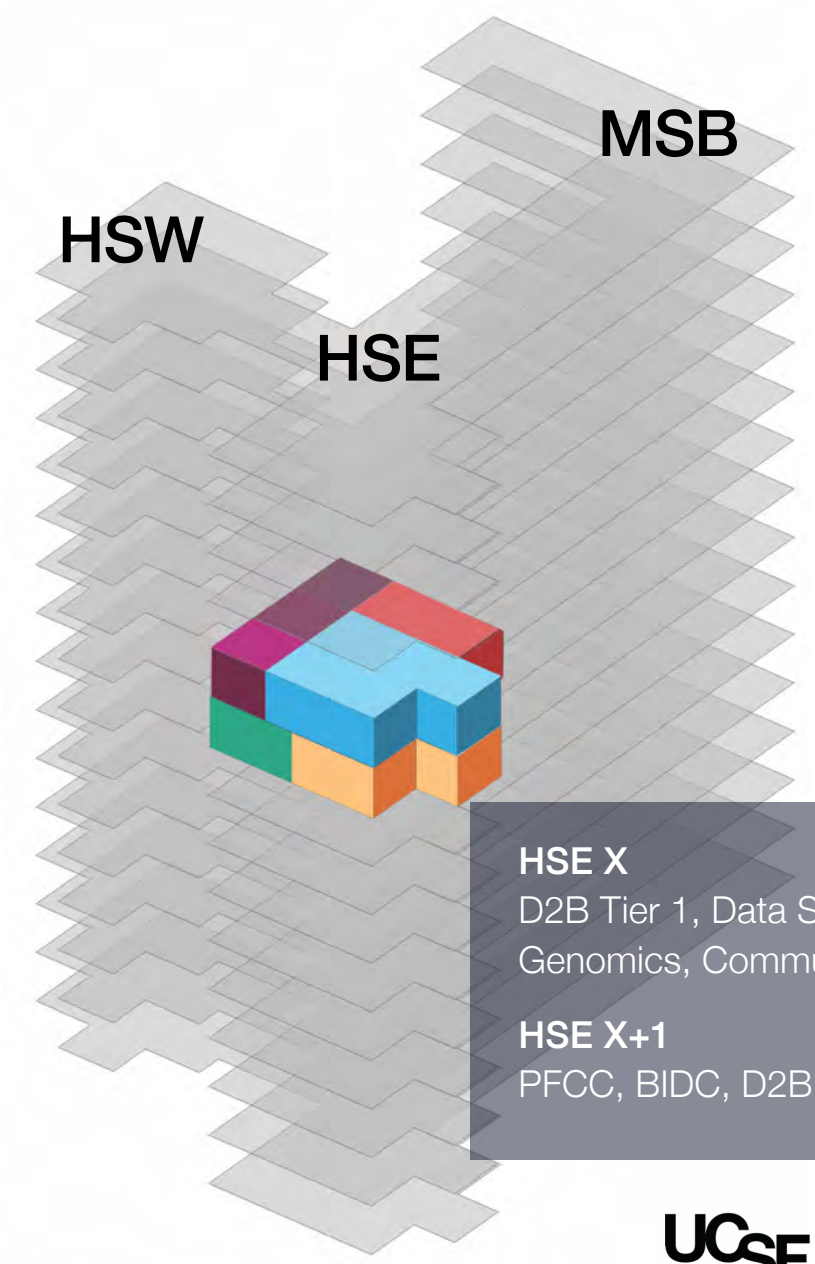
Space Options

Stacked Floors

- **Pros**
  - Sets of stacked HSIR floors are in need of renovation (HSE4/5/6, HSE11/12/13, HSW14/15/16)
  - Could be developed as functionally contiguous space with inclusion of an internal staircase and an atrium
- **Cons**
  - Does not promote interactions as well as a single-level design
  - Internal stairs/atrium sacrifices space
  - Does not leverage underutilized space between HSE & HSW



HSE X
D2B Tier 1, Data Sciences, Functional Genomics, Communal Functions

HSE X+1
PFCC, BIDC, D2B Tier 2 & 3

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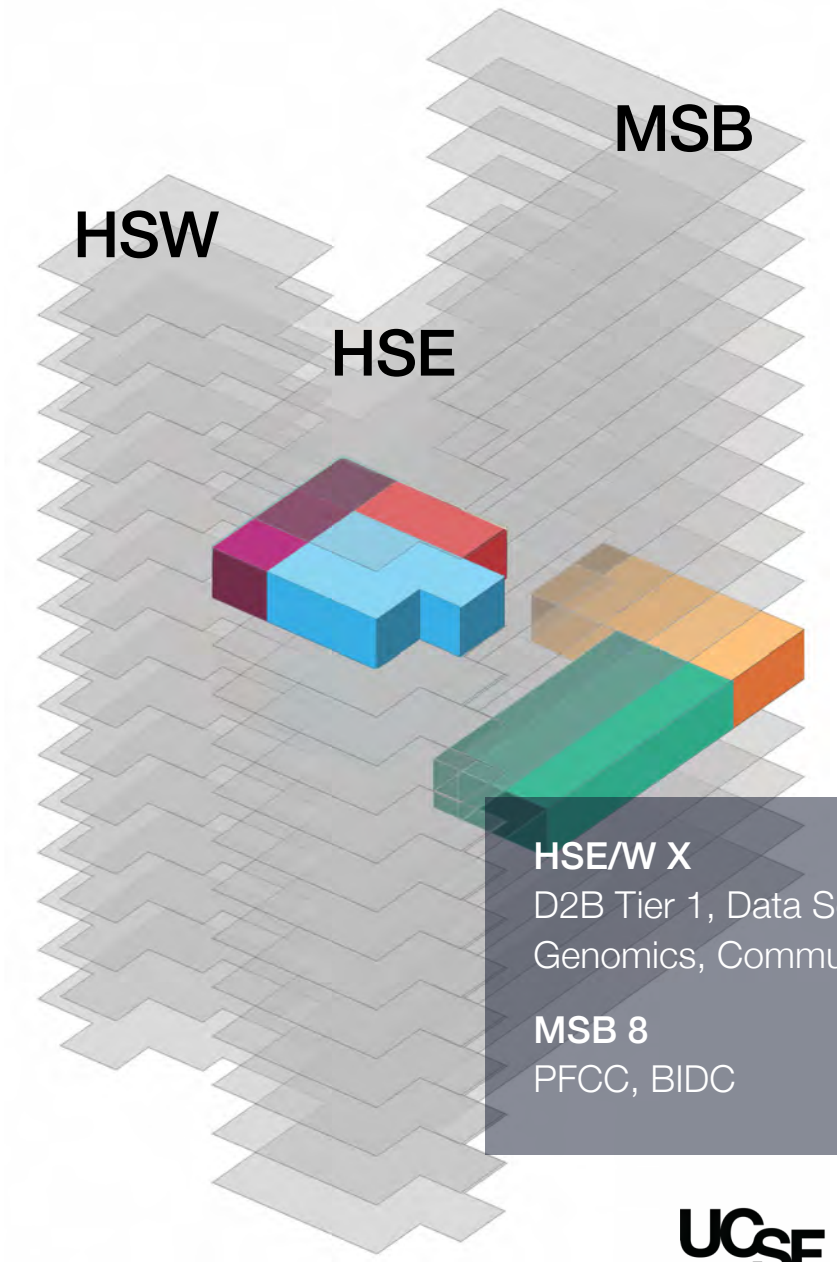
Space Options

Separated Floors

- **Pros**
  - Retains PFCC in existing space
  - Only need to relocate occupants of one floor
- **Cons**
  - Non-contiguous space
  - Discourages interactions
  - Less ability to adapt to new demands for space
  - Requires some duplication of space program elements
  - Requires development of additional space outside of the main CoLabs HSIR floor to accommodate expansion of PFCC and a new BIDC facility



HSE/W X
D2B Tier 1, Data Sciences, Functional Genomics, Communal Functions

MSB 8
PFCC, BIDC

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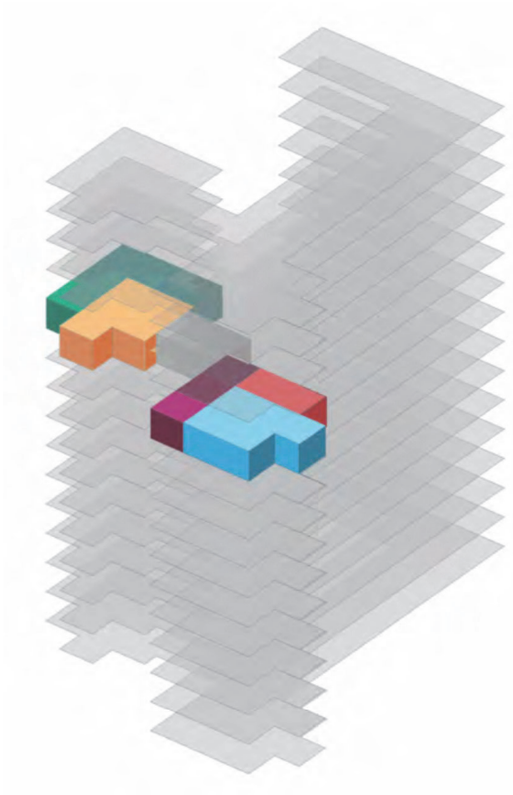
Space Options Recommendations

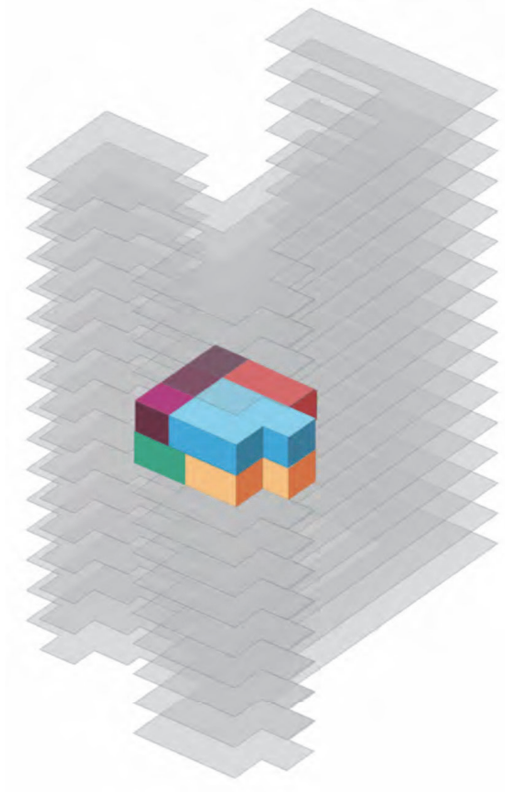
Adjacent

HIGHLY RECOMMENDED



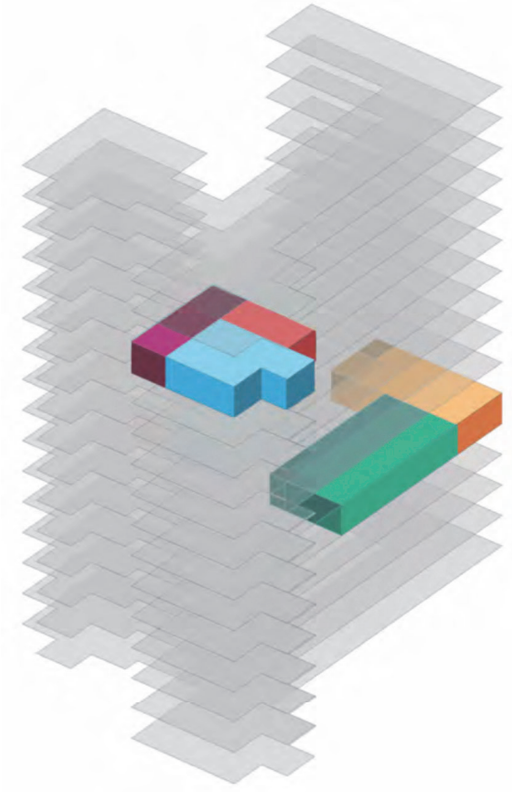
Stacked

VIABLE OPTION



Separated

NOT RECOMMENDED



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Adjacency issues

- **Should be centrally located**
  - Increased visibility
  - Better access for those in multiple buildings including the HS towers, MSB, and the Dolby Regeneration Medicine Building
  - Encourages more interactions
- **Uncertainties about future locations of other facilities is a challenge**
  - More information about Parnassus plans could help
  - Waiting for a complete Parnassus plan would introduce major delays
  - The CoLabs design should be flexible enough to allow repurposing of CoLabs space as needed

Financing

- ## Start-up costs
  - **CoLabs construction costs:**

    Working estimate is $30M for 2 tower floors
  - **CoLabs equipment costs:**

    Large majority of equipment already exists and can be relocated to CoLabs
  - **Displaced labs relocation costs:**

    Estimated relocation budget is between $400 asf and $2,000 asf

- ## Operating costs
  - **Funding sources:** Recharge, subscription, grants, 100/20 model, & campus support ($400K/year)
  - **Launch:** 2018-2019

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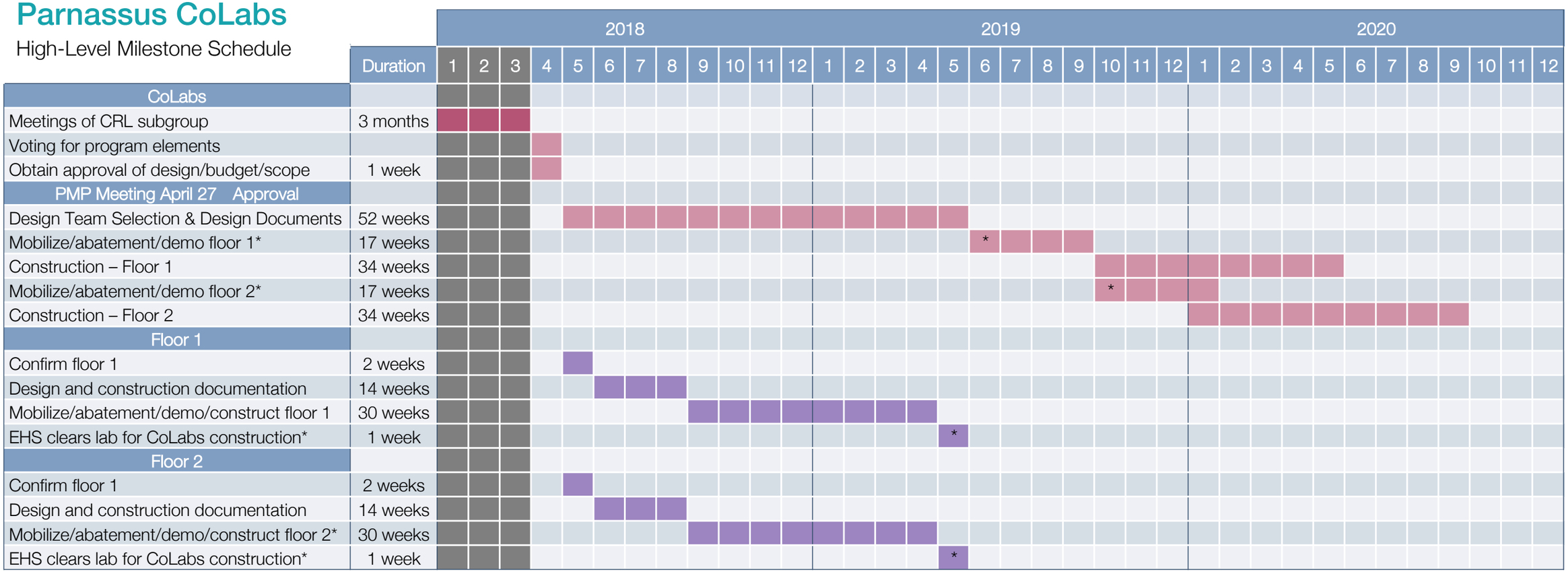
Timeline (subject to change)

Parnassus CoLabs

High-Level Milestone Schedule



	Duration
CoLabs	
Meetings of CRL subgroup	3 months
Voting for program elements	
Obtain approval of design/budget/scope	1 week
PMP Meeting April 27 Approval	
Design Team Selection & Design Documents	52 weeks
Mobilize/abatement/demo floor 1*	17 weeks
Construction – Floor 1	34 weeks
Mobilize/abatement/demo floor 2*	17 weeks
Construction – Floor 2	34 weeks
Floor 1	
Confirm floor 1	2 weeks
Design and construction documentation	14 weeks
Mobilize/abatement/demo/construct floor 1	30 weeks
EHS clears lab for CoLabs construction*	1 week
Floor 2	
Confirm floor 1	2 weeks
Design and construction documentation	14 weeks
Mobilize/abatement/demo/construct floor 2*	30 weeks
EHS clears lab for CoLabs construction*	1 week

* *Dependent events*

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CoLabs and the Future of Parnassus

The CoLabs project is important both as a resource and as a symbol

Many are deeply skeptical that Parnassus is the best place to do science and acutely aware of the lack of parity with Mission Bay

CoLabs can help by:

- Making Parnassus a better, more exciting place to do research
- Providing a highly visible early example of how UCSF is reinvesting in Parnassus

The success of the CoLabs will require a real commitment

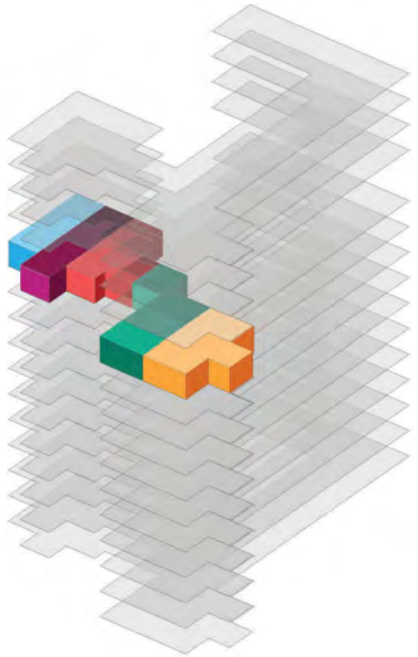
There are competing demands for space, funds, and attention

Finding a suitable CoLabs site will be hard

Detailed CoLabs planning must continue over the coming months

An ongoing investment will be required

Summary



Key principles

- Be “big and bold”
- Start now, maintain a sense of urgency, communicate clearly
- Continue to engage the faculty since many want to help solve problems and identify opportunities
- Make the CoLabs a transformational resource for Parnassus

Major recommendations

- Focus on site selection since this is currently the rate-limiting step
- We strongly recommend a centrally located, contiguous space (~20,000 sq. ft. or two tower floors)
- Develop a system for working with displaced groups to find good relocation solutions for them
- Funds will be required for ongoing CoLabs operations as well as CoLabs construction (including relocation)
- Many CoLabs activities should begin before the new space is completed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CRL Task Force Members

Disease-to-Biology (D2B)
Saurabh Asthana
Vincent Chan (lead)
Hugh Cotter, Oculus Architects
Diane Kay
Max Krummel (lead)
Tippi Mackenzie
Patti Mitchell
Jeff Mulish
Jeroen Roose
Elizabeth Sinclair
Matt Spitzer
Scott Vandenberg

Biological Imaging Development Center (BIDC)
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Diane Kay
Max Krummel
Diana Laird
Delaine Larsen
Mark Looney
Patti Mitchell
Matt Spitzer
Val Weaver
Torsten Wittmen
Katherine Yang (lead)

Flow Cytometry
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Diane Kay
Max Krummel
Mike Lee
Cliff Lowell
Patti Mitchell
Matt Spitzer (lead)
Qizhi Tang

Transgenic
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Hugh Cotter, Oculus
Diane Kay
Averil Ma
Alex Marson
Mike McManus (lead)
Patti Mitchell
Elizabeth Sinclair

Physical Environment
Eric Chow (lead)
Hugh Cotter, Oculus
Diane Kay
Patti Mitchell
Elizabeth Sinclair
Matt Spitzer

Genomics
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Andrea Barczak
Eric Chow
Hugh Cotter, Oculus
Lindsey Criswell
David Erle
Chun (Jimmie) Ye
Diane Kay
Alberto Marquez
Alex Marson (lead)
Michael McManus
Patti Mitchell
Yin Shen
Elizabeth Sinclair
Ryan Wagner
Pui Yan Kwok

Data Sciences/Data Library (Bioinformatics)
Hugh Cotter, Oculus
Lindsey Criswell (lead)
Walter Eckalbar
Diane Kay
Patti Mitchell
Elizabeth Sinclair
Matt Spitzer
Chun (Jimmie) Ye (lead)

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Current locations of related facilities (partial)

Disease to Biology/Sample Processing	HSE 3 multiple rooms (Immunoprofiler) MSB 1234 (CTSI Clinical Specimen Processing Lab) Fong, Spitzer, Ye labs at PH ZSFG Building 100 (Core Immunology Lab)
Flow Cytometry	MSB 8 (854a/b, 854, 860) MSB 14 (1456) HSE 3 (301D, 302E) HSW 5 (542) HSW 12 (1209)
Imaging	MSB 11 (1105, 1109/S1109A, 1114, 1121, 1123) HSW 5 (536, 539) MB Genentech Hall (Nikon Imaging Center)
Data Sciences/Data Library	HSE 304 Ye lab at PH MB Rock Hall (Functional Genomics Core Bioinformatics)
Functional Genomics (including Transgenic Animals)	HSW 9 (IHG) and HSW 10 (Diabetes Center/PCAT) Marson, McManus, and Ye labs at PH MB Genentech Hall (Center for Advanced Technologies, Cell & Genome Engineering Core) MB Rock Hall (Functional Genomics Core) Gladstone (Transgenic Core) Ahituv and Erle labs at MB

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Preliminary Space Program

Group	Perm Staff	Priv. Office	Shared Office #	Shared Office P	Work Desks	Anal. Stats	Wet Lab Stats.	BSC	GSF	Notes
Disease to Biology - D2B										
Tier 1 (Immuno/ Bios/ Organoids)	13	0	0	0	11	0	9	7	1531	
Tier 2- CIL	6	0	1	4	0	0	0	3	520	
Tier 3- CTSI- Specimen Collection	6	0	0	0	4	0	0	2	455	
PFCC Flow Cytometry	10	1	0	0	6	0	2	0	3511	
BIDC	5	0	1	5	0	6	4	0	2426	
Data Sciences/Data Library	6	0	0	0	0	8	0	0	216	
Genomics	9	0	0	0	6	0	16	4	1541	
General Admin/ Shared Support	5	2	1	3	0	0	0	0	3610	Allows for private offices for ImmunoX/ CRL director, RRP director, shared office for Strategic Alliance, D2B and Bios managers (total approx. 330 GSF); shared spaces such as Huddle rooms (6); small Conference (2); Large Conf. (1), Seminar/ Training room; Kitchen/ Break; IDF's; Recycling, Electrical Rms.
Shared Lab Support	0	0	0	0	0	0	0	0	450	Shared functions such as gas bottle storage, shared fume hoods, chemical storage rooms.
Sub-total	60	3	3	12	27	14	31	16	14260	
Circulation @ 35%									4991	May vary from 15% to 35% in lab suites, but calculated at 35% at this time due to design aesthetic and desire to have open spaces which may increase required SF for various program elements and access to them.
ESTIMATED TOTAL GSF									19251	

Notes

1. This program has been developed based on meetings/calls with each of the individual groups and meetings/calls with full sub-committee members.
2. General Admin / Shared Support includes (3) Management Offices (Private offices for CRL Lab Manager, RRP Manager and shared office for Strategic Alliance, D2B and BIOS); (6) Focus/Huddle Rooms; (2) Small Conference Rooms; (1) Large Seminar Room; (1/2) Break Room; (2) IDF; (2) Electrical Rooms; (2) Emergency Supply Rooms
3. Shared Lab Support includes shared (2) Gas Bottle Storage; (2) Chemical Storage Rooms; (2) Fume Hoods.
4. Hoteling stations not added at this stage; multiple "embedded researcher" stations provided.
5. BSL 2* Tissue Culture may not be provided.
6. Wet Lab stations are wet lab knee holes and do not include desks adjacent. Some shared desks will be added.
7. All information here should be considered as preliminary and should be fully verified.

COLABS AT PARNASSUS

Annual operational support request (first draft)

CoLabs Directors Support	$ 180,000
Technology Development Projects	70,000
General Lab Maintenance	50,000
Operational Support	100,000
Total Annual cost	$ 400,000

Courtesy of Elizabeth Sinclair

University of California
San Francisco

CoLabs initiative



December 2017 Charge from the PH Master Plan Steering Committee

- Design a new model for central lab resources
  - Capitalizes on critical personnel and cutting-edge methods & technologies
  - Drives collaboration across disciplines
- Produce high level plans for contiguous space housing all CRL components
  - Integrates core activities into one centralized place, *i.e.* sample processing, high-dimensional imaging, multi-“omic” analyses, and others
- Maximize impact & engagement
- Launch within a 2-year timeline

CRL SUBGROUP COMMITTEE

Membership and Process



NADAV AHITUV, PHD
Bioengineering & Therapeutics



DIANE KAY
Space & Capital Planning



PATTI MITCHELL
Capital Programs



JIMMIE YE, PHD
Epidemiology & Biostatistics



VINCENT CHAN, PHD
Pathology



MAX KRUMMEL, PHD
Pathology



ELIZABETH SINCLAIR, PHD
Research Resource Program



KARIN WONG
Space Strategy



ERIC CHOW, PHD
Biochemistry & Biophysics



TIPPI MACKENZIE, MD
Surgery



MATTHEW SPITZER, PHD
Otolaryngology—
Head and Neck Surgery



HUGH COTTER, AIA
Oculus Architects, Inc.



LINDSEY CRISWELL, MD, MPH
Medicine



ALEX MARSON, MD, PHD
Microbiology and Immunology



SAUL VILLEDA, PHD
Anatomy



DAVID ERLE, MD
Medicine



MICHAEL MCMANUS, PHD
Diabetes Center



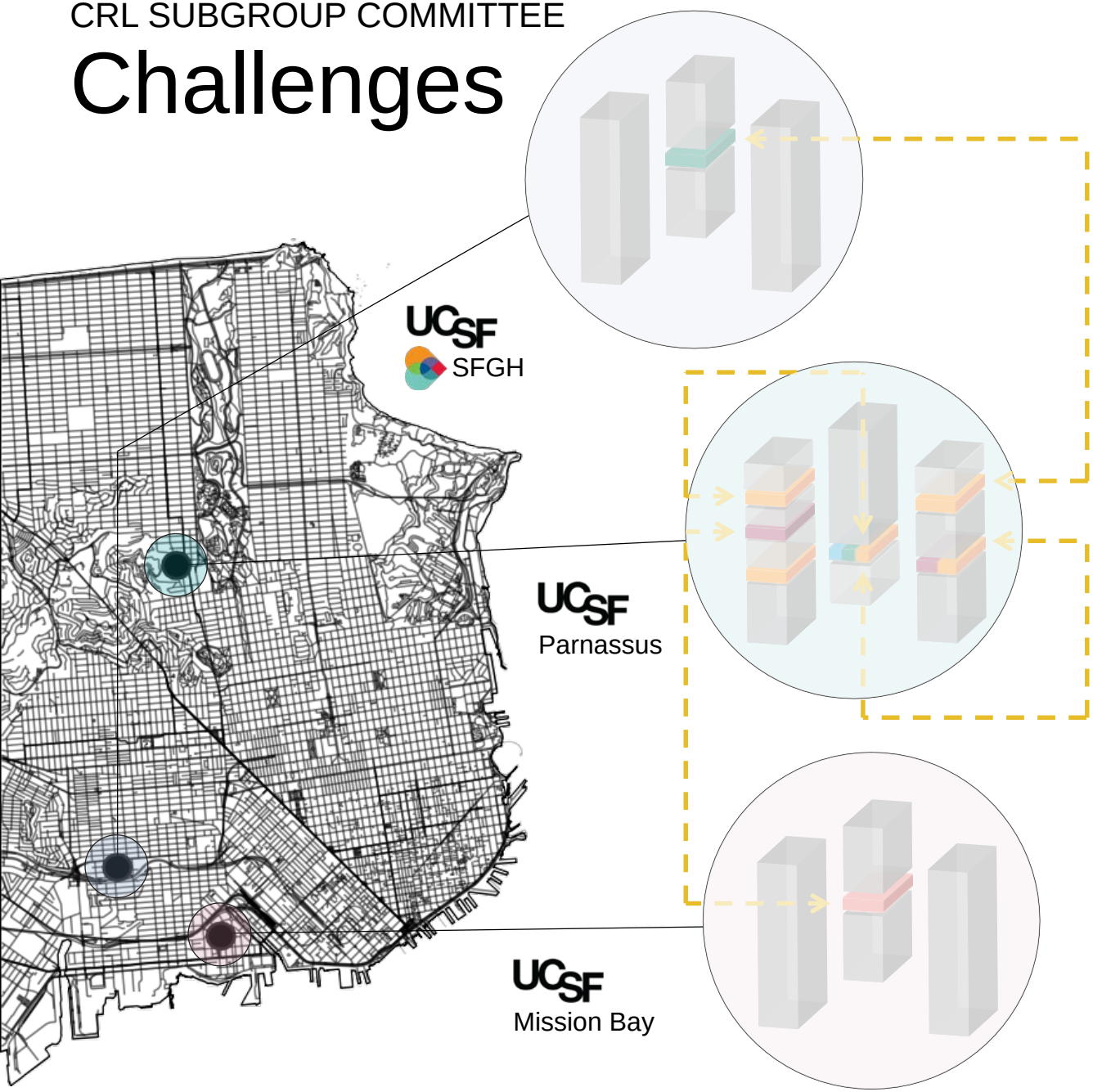
KATHERINE YANG, PHARMD, MPH
Clinical Pharmacy

JANUARY-APRIL 2018:

- 5 committee meetings
- 7 task forces
- Website, email announcements
- Existing facility inventory
- Site visits
- Endorsement by PH Master Plan Steering Committee

CRL SUBGROUP COMMITTEE

Challenges



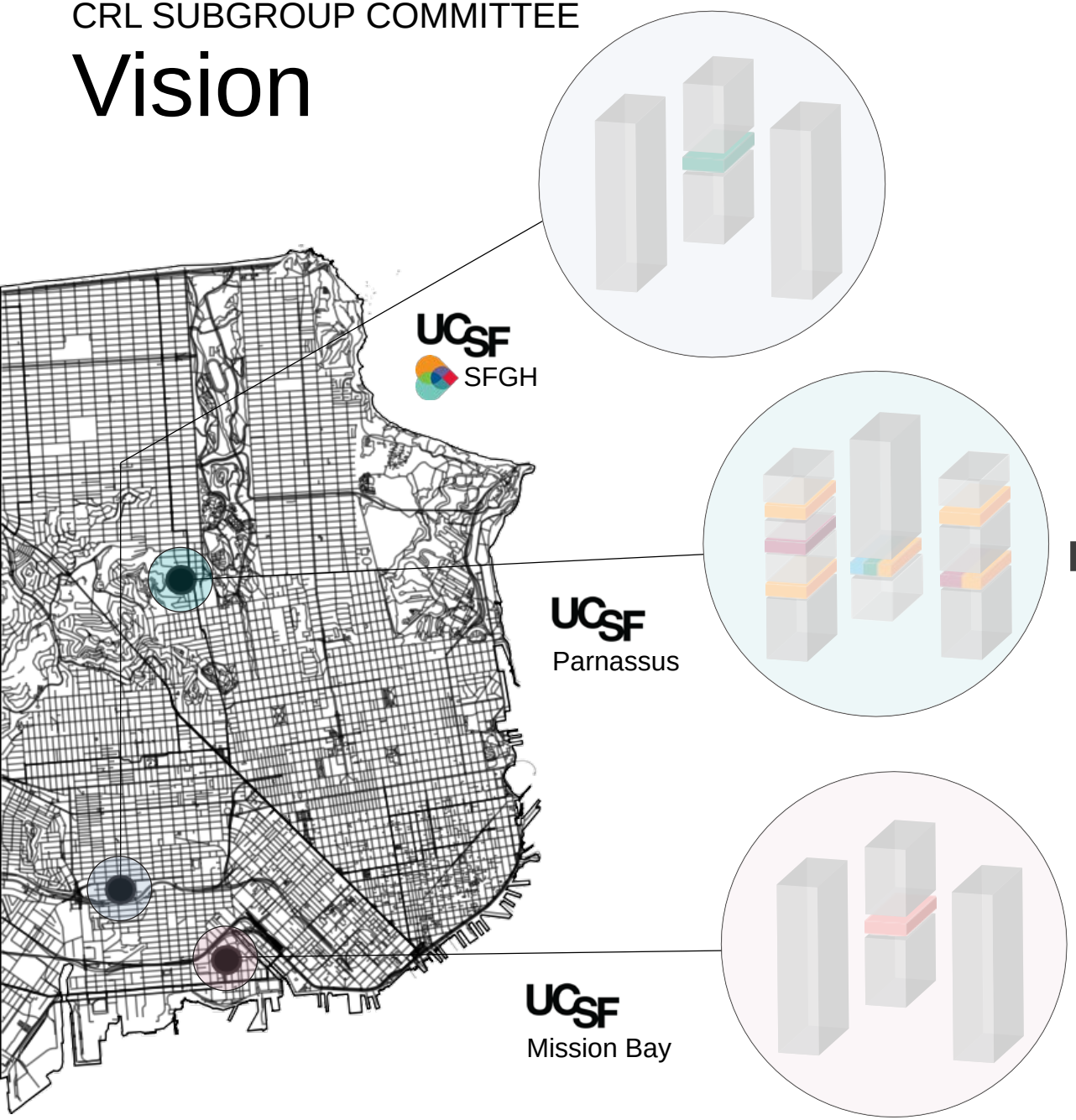
- Fragmented facilities
  - Difficult to find and use cores
  - Limits collaboration and synergies
  - Inefficient use of space and equipment
- Lagging investments in transformative methods & technologies
  - Data sciences
  - Genomics
- Unreliable long-term financial support
  - Inefficiencies
  - Inadequate institutional support for cores (9% versus 27% nationally)
- Retention of world-class staff

Goals & Opportunities

- ## Rejuvenating Parnassus
  Complete promptly a highly-visible model for developing big and bold initiatives at Parnassus
- ## Building on Parnassus' strength
  Emphasize Parnassus' unique strengths by exploring the biological basis of disease in transformative new ways and by complementing resources available elsewhere
- ## Fostering collaboration
  Enhance a sense of community by moving beyond the traditional "core" model and facilitating the communization of resources, expertise, and data
- ## Creating excellence, responsiveness, and sustainability
  Recruit and retain excellent people who are engaged and nimble in recognizing emerging opportunities, and who can promote the sharing of ideas and tools developed in individual labs
- ## Supporting education and training
  New concept of embedded researchers

CRL SUBGROUP COMMITTEE

Vision





UCSF
Parnassus

CRL SUBGROUP COMMITTEE

Design Concept

COLABS

AT PARNASSUS

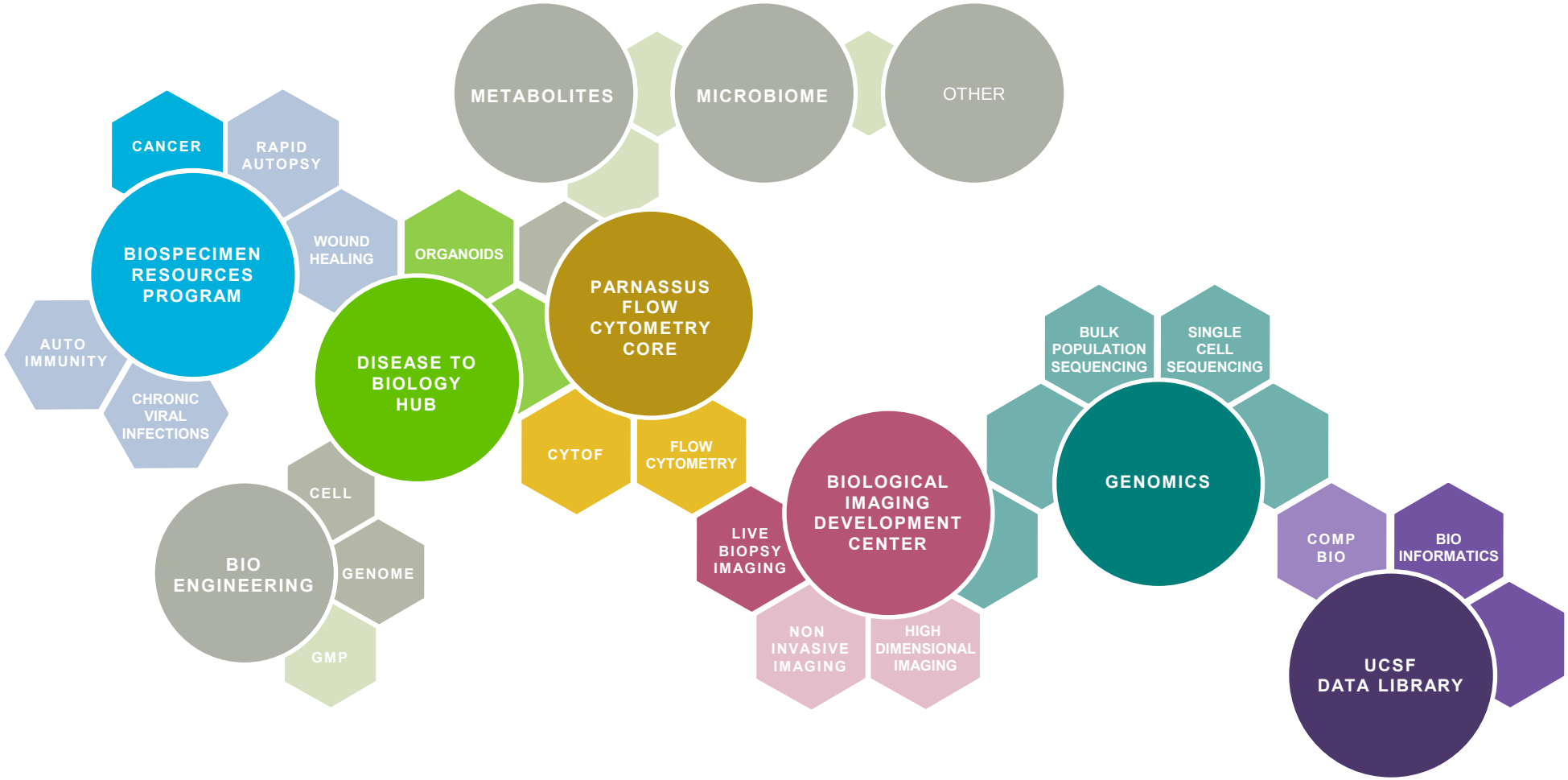


UCSF

Parnassus

The “C” is a multi-faceted representation of CoLabs: as a logomark; as an interconnected space of shared labs; as an open “ring of collaboration” that will mirror the eventual rejuvenation and space concept at Parnassus.

CoLabs at Parnassus



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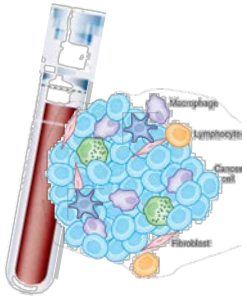
CoLabs CoProjects

CoProject Example

Pipeline Makes New Science Happen:

CLINIC TO LAB AND BACK





Jocelyn Chapman, MD is keen to understand the immune diversity of gynecological tumors that she is obtaining in the clinic. Like many clinician scientists, she does not have her own lab with the capacity to undertake this work. Instead, she is able to contribute tumor and blood specimens and a clinical research coordinator FTE to CoLabs.

BIOSPECIMEN RESOURCES PROGRAM

DISEASE TO BIOLOGY COLAB

FLOW CYTOMETRY COLAB

BIOLOGICAL IMAGING DEVELOPMENT COLAB

GENOMICS COLAB

DATA SCIENCES COLAB

COLABS PROJECT

Step 1. Jocelyn works with ImmunoX to define pilot project of 12 ovarian samples in the pipeline. BIOS works with Jocelyn to identify, consent, and acquire tissue & blood from patients.

Step 2. BIOS transfers tissue & blood to D2B technician. D2B technician takes a tissue slice for H&E/IF and dissociates the rest; the technician also isolates PBMCs from blood.

Step 3. D2B technician works with PFCC personnel to reserve FACS, sort tumor/immune cells for multi-omic analyses, and runs several stain panels to understand the immune composition.

Step 4. BIDC personnel receives tissue slices from D2B technician and uses multiplexed IF imaging techniques and quantification methods to understand spatial interplay of tumor/immune cells.

Step 5. Genomics personnel receives sorted tumor/immune cells from D2B technician and isolates RNA & DNA for transcriptomic & genomic sequencing of tumor/immune compartments.

Step 6. Bioinformaticians receive, curate, and store all data (including clinical) in the UCSF Data Library, and work with Jocelyn to develop analytical tools to mine the ovarian tumor dataset. Data is “freed” to all UCSF investigators after set determined time.

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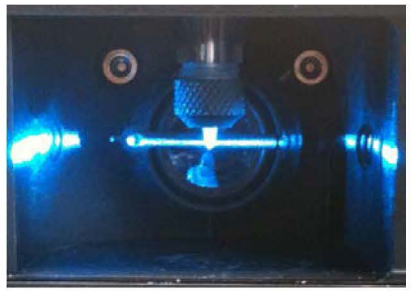
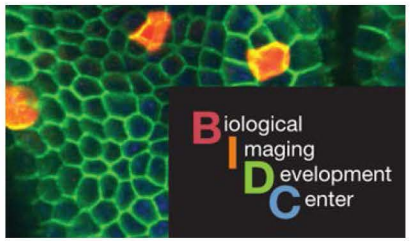
COLABS AT PARNASSUS

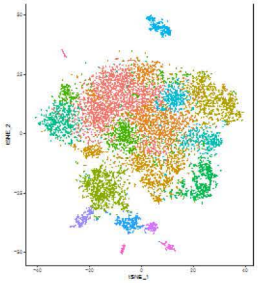
Established Entities to Be Incorporated Into CoLabs



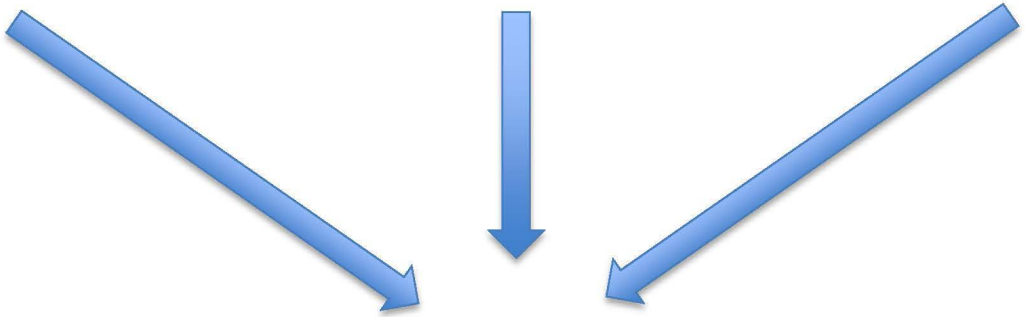
Parnassus Flow Cytometry Core
>100 PI's, ~$1.6M/year (recharge)



Biological Imaging Development Center
>50 PI's, ~$750K/year (subscription)



Functional Genomics Core Facility
>50 PI's, ~$1.1M/year (recharge, grants)



UCSF immunoprofiler CONSORTIUM

ImmunoProfiler
~25 PI's, ~$15M (industry)

COLABS

Selected services

UCSF Institute for Human Genetics

IHG Genomics Core

UCSF University of California San Francisco

COLABS AT PARNASSUS

Net Impact on Researchers

Improve services for existing users of Parnassus cores

- PFCC (Flow Cytometry) >100 PIs
- BIDC (Imaging) 51 PIs, 19 departments
- CTSI CRS Sample Processing Core 59 PIs
- IHG Core Single Cell RNA-seq ~50 PIs
- Parnassus Center for Advanced Technology ~15 PIs
- Immunoprofiler Flow/Sequencing and Allied Projects ~25 PIs

Provide on-site access to key services now only available elsewhere

- Nikon Imaging Center in Genentech Hall 191 PIs, ~15% at Parnassus
- Center for Advanced Technology in Genentech Hall 150 PIs, ~15% at Parnassus
- Transgenic Core at Gladstone ~35 UCSF PIs, >50% at Parnassus
- Functional Genomics Core in Rock Hall 55 PIs, 49% at Parnassus
- Clinical Immunology Lab at ZSFG

Unlock access to powerful emerging technologies for existing and new users

- Data sciences for storage and analysis of large datasets (including genomics)
- New imaging and single cell analysis methods
- Advanced gene editing (CRISPR and beyond)
- Massively parallel functional assays

Financing

- Start-up costs
  - Construction, new personnel and equipment
  - Funds identified through campus, philanthropy, EVCP strategic opportunities
- Operating costs
  - ~$10M annual operating budget
  - Recharge, subscription, & grants will cover most costs
  - Institutional support (~$850K/year) to support innovation and administration
    - EVCP strategic funds will cover institutional support for first 5 years

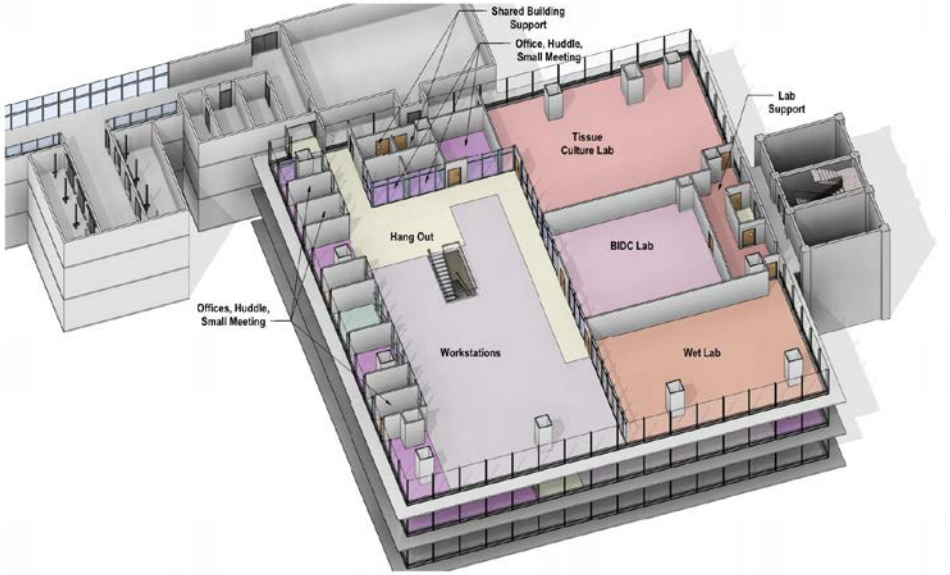
Current status

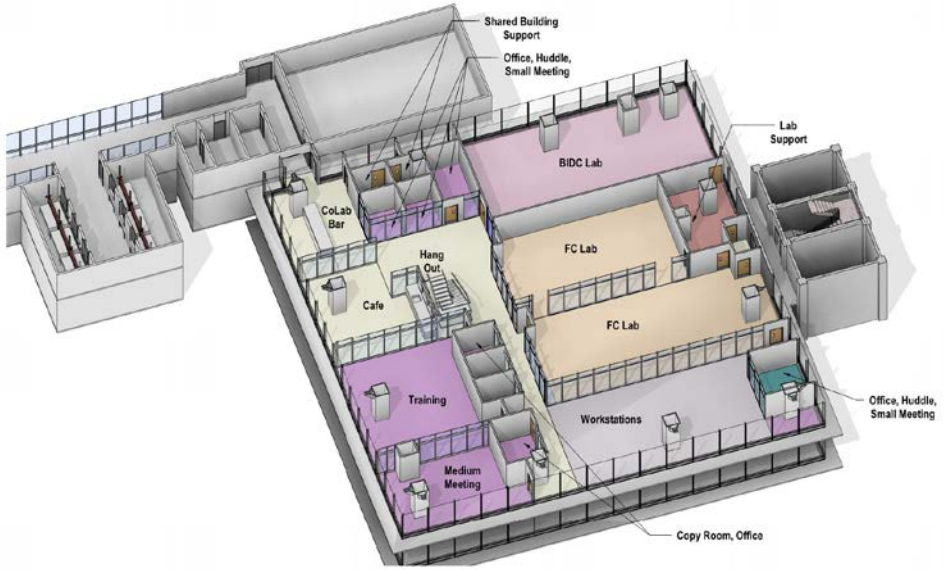
Phase 1 will open in temporary space on MSB-8 in 2019

- Start Data Science CoLab, support first CoProjects
- ~4500 sf (plus adjacent existing flow core space)

Space planning for phase 2

- Selected HDR as design firm
- 30+ participants in 3 workshops spanning 7 full days in November and December 2018
- Key goals
  - High impact/visibility, welcoming, promote collaboration, flexibility, efficiency
- Finalizing space program for 23K asf (2 tower floors)
- Includes wet lab, equipment rooms, tissue culture and other lab support, desktop research, teaching lab, conference/huddle, interaction space, admin, lactation room
- Anticipated head count: 79
- Design phase will follow *(images at right are test fits and not final designs)*





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COLABS AT PARNASSUS



University of California
San Francisco

Digital Hub
@ Parnassus Heights

November 27, 2018
Parnassus Master Plan Steering Committee

Julia Adler-Milstein, PhD
Aaron Neinstein, MD
Robert Wachter, MD

I am a: clinician at UCSF

I want to: inform a treatment decision for one of my patients by building an on-demand cohort of similar UC patients to compare.





I am a: clinician at UCSF

I want to: improve the way our current EHR supports medication reconciliation for my clinic's patient population.

UCSF

I am a: researcher at UCSF

I want to: build a decision support app that delivers real-time risk predictions to UCSF intensive care teams.





I am a: faculty member at Harvard doing cutting-edge robotics research

I want to: move to an institution where I can seamlessly collaborate with other digital health faculty and a health system that will allow me to test and refine my designs.

UCSF

I am a: well-established Silicon Valley technology company

I want to: work with an academic health center to co-develop a breakthrough technology that improves population health.





I am a: start-up tech company

I want to: pilot test my new solution that improves OR scheduling and throughput.

I am a: third year Orthopedics resident at UCSF

I want to: work with UCSF digital health faculty to refine and pilot a new clinical decision support algorithm.



UCSF's early successes in Digital Health

	UCSF Bakar Computational Health Sciences Institute	cdhi Center for Digital Health Innovation at UCSF	UCSF Health Informatics	CTSI at UCSF	UCSF Department of Medicine, Center for Clinical Informatics and Improvement Research	UCSF Clinical Innovation Center	UCSF Innovation Ventures	Enterprise Information & Analytics
Successes	Information Commons UC Data Warehouse	GE voalte SAMSUNG TIDEPOOL	Epic EHR Clinical Decision Support Telehealth	Eureka Learning Health System Projects De-ID'd Data	The Office of the National Coordinator for Health Information Technology AMIA AHRQ	Inside Out Accelerator	Catalyst Program Entrepren. Center	Clinical Data Request Process Ops & Clinical Dashboards
Expertise	• Bioinformatics • Omics • Data Science	• Data Science • Software Development • Clinical Informatics • Commercial Partnerships • Early-Stage Innovation	• Clinical Informatics • Clinical Analytics • Operations	• Clinical Research	• Health Informatics Research • Health Informatics Policy	• Implementation Science • Service Design	• Licensing • Intellectual Property • Partnerships	• Analytics • Dashboards

… and much more within Departments



Stefano Bini, MD

Department of Orthopedic Surgery

HealthLoop



Gabby Schmajuk, MD



Jinoos Yazdany, MD

Department of Medicine

Patient Reported Outcomes in Rheumatology



Xiao Hu, PhD

School of Nursing

SuperAlarm

UCSF

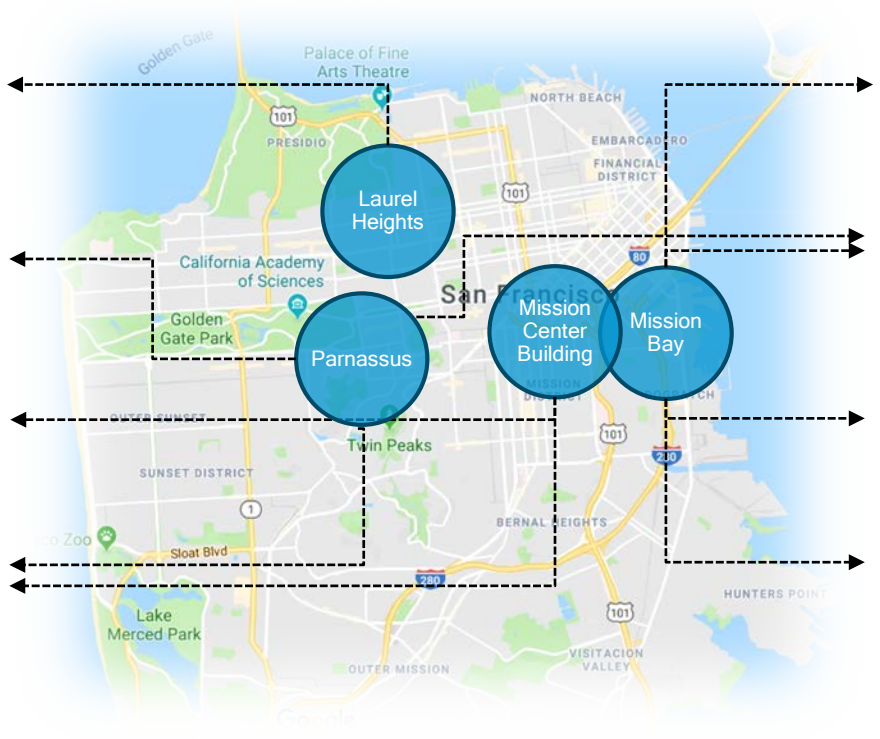
Our digital groups are geographically dispersed…

Center for Clinical Informatics & Improvement Research

Clinical Innovation Center

Enterprise Information & Analytics

Health Informatics & Clinical Systems



Bakar Computational Health Sciences Institute

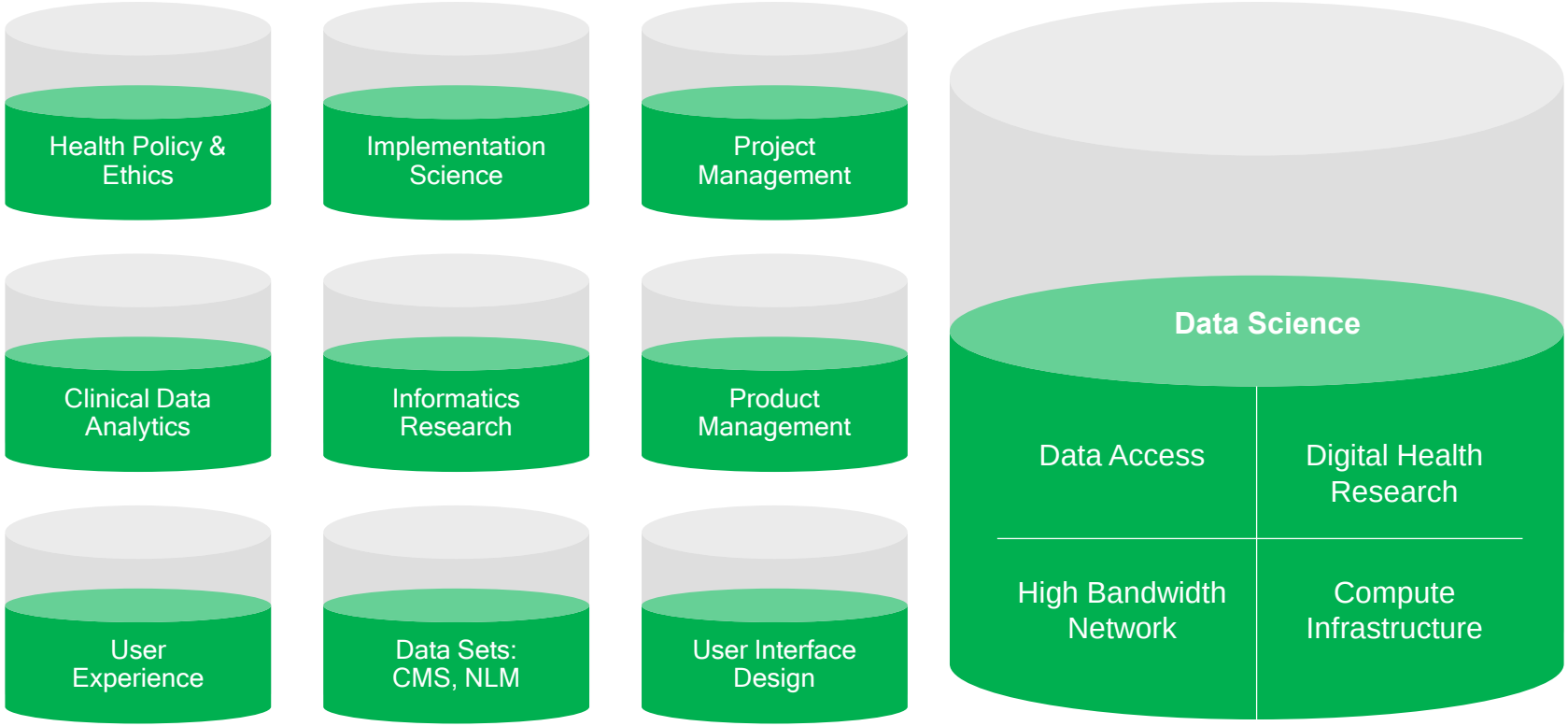
Center for Digital Health Innovation

Clinical & Translational Science Institute

Innovation Ventures

UCSF

… and we have key resource gaps



… as well as poorly coordinated resources, leading to frustrated UCSF faculty and external partners



User Experience

Design

Epic EHR

IRB

Privacy

Sandbox

APIs

Informatics

Info. Commons

Data Science

Data

Care Delivery

I want to do a digital health project at UCSF. Where do I go?

UCSF has an opportunity to be *the* premier university for digital…

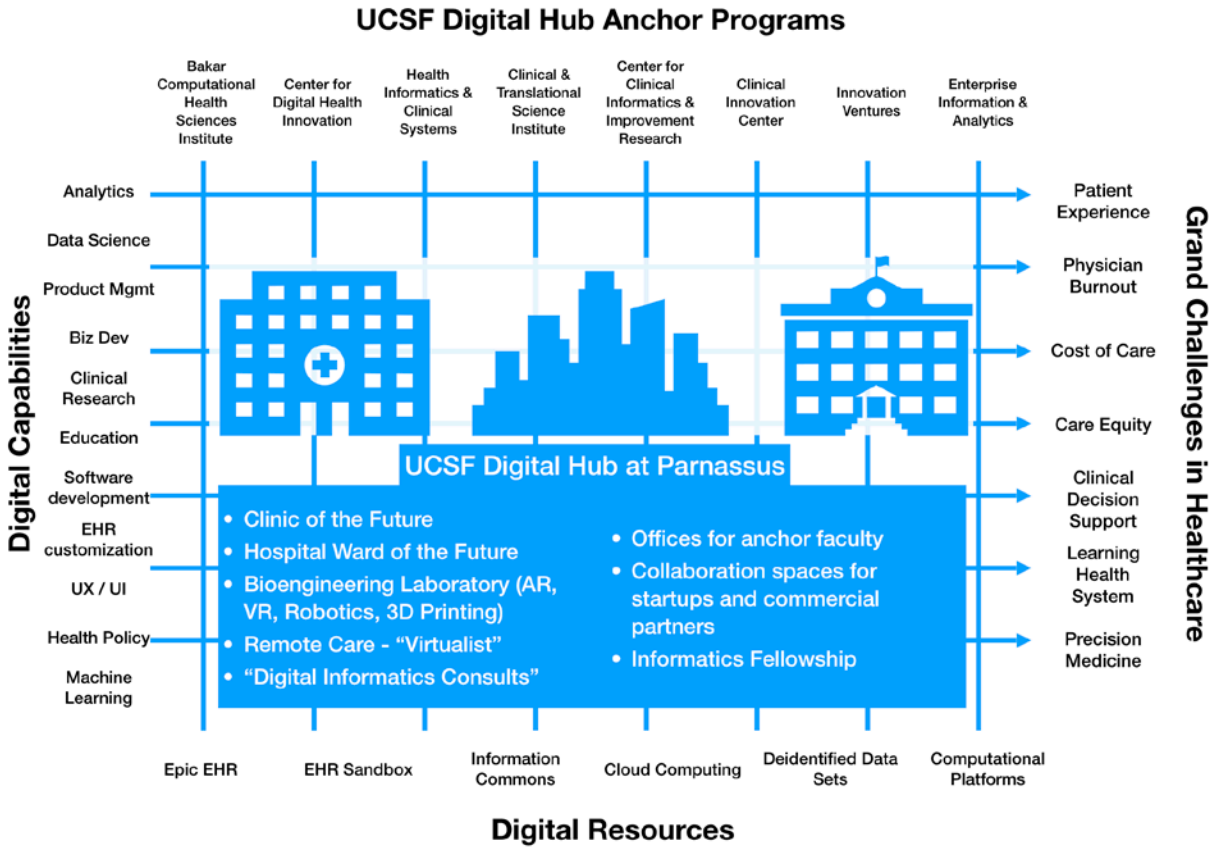


- … care
- … education
- … innovation
- … research
- … entrepreneurship
- … partnerships

Vision

To be the premier university in the world for digital, by…

streamlining Digital Health at UCSF to seamlessly support the needs of clinicians, researchers, trainees, and external partners…

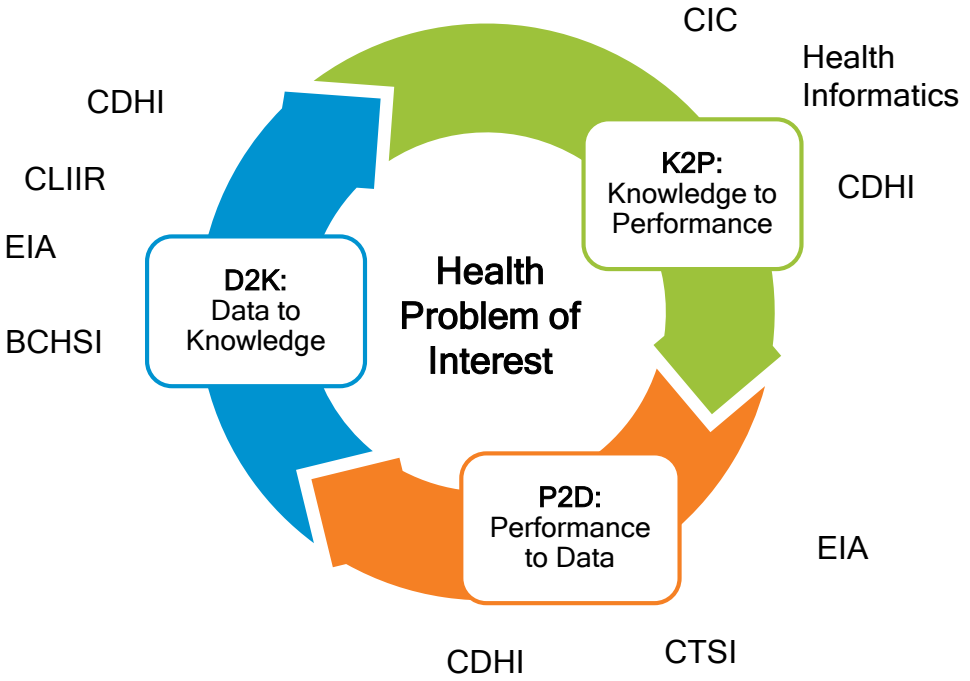


Note: BCHSI remains at Mission Bay, but will be core member of the Digital Hub and have a presence at Parnassus

Vision

… allowing current UCSF Digital Health assets to work together to deliver a true Learning Health System.

Learning Health Cycle



*With engagement of policy, ethics, patient engagement, disparities groups

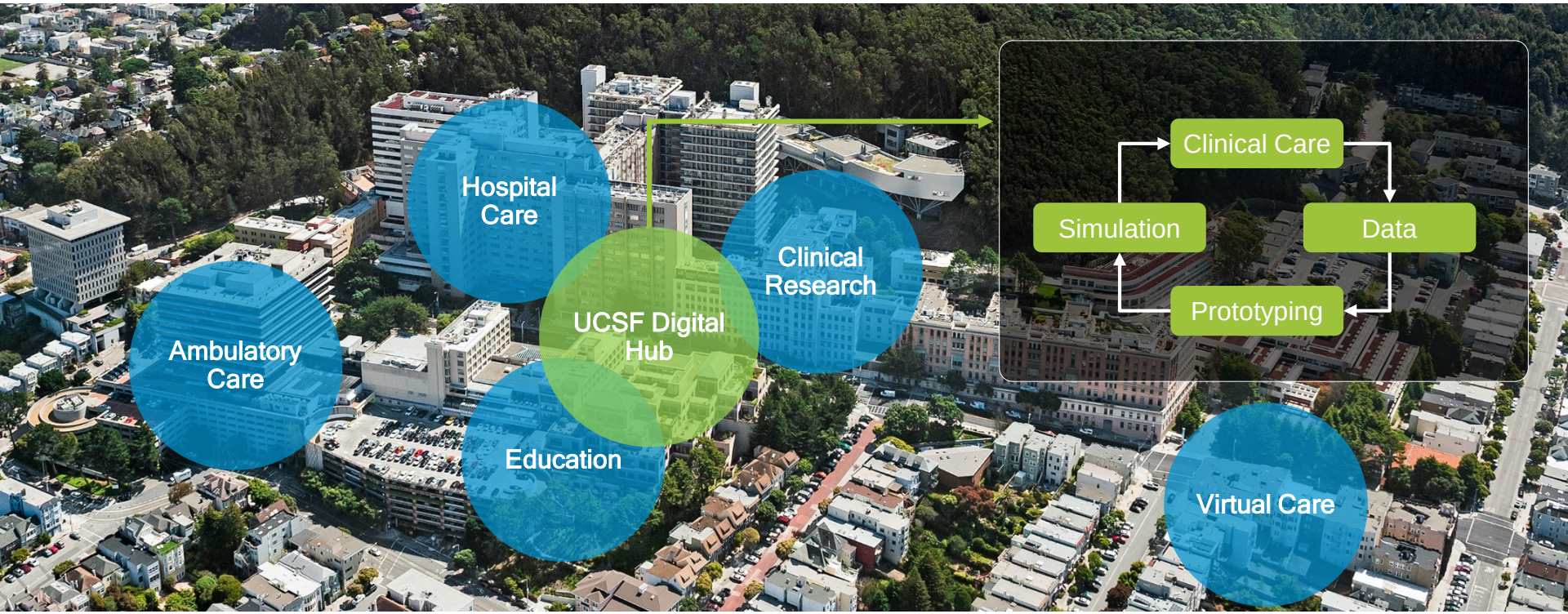
UCSF

UCSF Digital Hub: Four Core Areas



	Entrepreneurship & Innovation	Simulation & Testing	Collaboration & Resources	Education & Training
Examples	Accelerator for Internal Ideas Entrepreneurs in Residence Co locate with Industry Partners	Basic & Translational Digital Research Implem. Science: Ward of the Future	One Stop Shop for Consultations: IRB, Privacy, Legal, Risk, Security, Design, EHR Integration Product Management	Clinical Informatics Fellowship Program Public Facing Digital Health "Exploratorium"

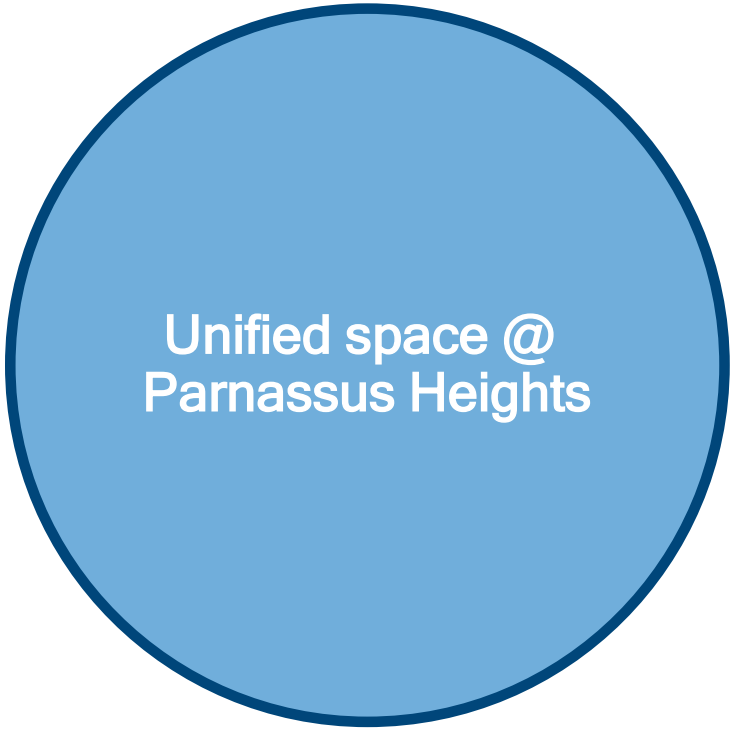
UCSF Digital Hub belongs at Parnassus Heights



UCSF Digital Hub – Governance



- Broad representation from community of digital entities and core users (e.g. clinical departments)
- Federated model: maintain autonomy of constituent units while emphasizing cross-cutting projects, communication (between silos and externally-facing), convening, education, collaboratory
- Decision Making & Authority
  - $1-2M/yr, staff to purpose, 3-5 staff to start
  - Focused on strategic planning, space mgmt., building & managing cross-cutting projects


Unified space @
Parnassus Heights


New federated program,
strategy and governance

Appendix

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San Francisco

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Working Group Membership


Julia Adler-Milstein


Aaron Neinstein


Steven Bin


Stefano Bini


Rachael Callcut


David Dobbs


Xiao Hu


Carolyn Jasik


Elsbeth Kalenderian


Marc Kohli


Michael Lesh


Chandler Mayfield

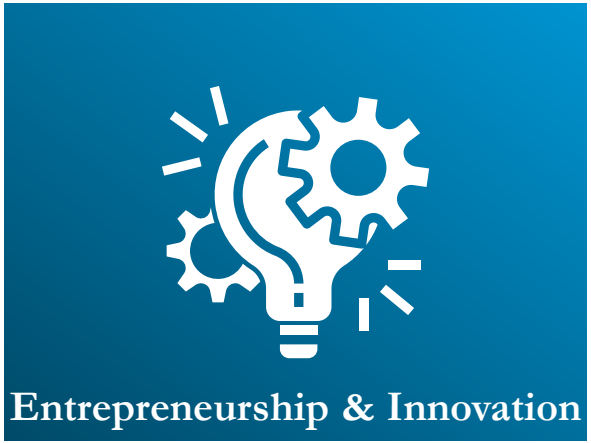

Rosa Rodriguez-Monguio


Cara Fladd


Sharon Priest

Full-Time Occupants – Current & Projected

Team	Current @ Parnassus Heights		FY20 @ Digital Hub		FY25 @ Digital Hub	
	Low	High	Low	High	Low	High
CDHI	12	17	25	50 (Increasing team size & shift staff from MB)	35	80
CLIIR	0	0	10	20		
CIC	8	10	8	10		
CTSI	0	0	5	15	5	25
Dept of Epi/Biostats						
BCHSI	0	0	1	2		
EI&A	0	0	5	15	8	20
Health Informatics	5	10	4	6		
Informatics Trainees	5	10	5	10	8	15
EIR / Incubator	0	0	2	3		
Clinical Dept people			10	15		
Totals	30	47	70	131		



- Collaborative Environment
  - Attract and recruit top talent
  - Strengthen synergies of existing UCSF people and assets
- One Stop Shop for Consultations: IRB, Privacy, Legal, Risk, Security, Design, UX, Product Management, EHR



- Basic Digital Research: Utilization of large data sets with ML & AI
- Translational Digital Research: Rapid design and prototyping
- Implementation Science: Laboratory Practice. Ward of the Future. Hospital at Home
- Post-Market Digital Surveillance



Collaboration & Resources

- Data Science Resources
- Accelerator for Internal Ideas
- Entrepreneurs-in-Residence
- Co-locate with Industry Partners
  - Co-Development
  - Validation



Education & Training

- Seminars and Events
- Education: Data Science, Informatics, Design, Entrepreneurship
- Clinical Informatics Fellowship Program
- Public-Facing Digital Health “Exploratorium”

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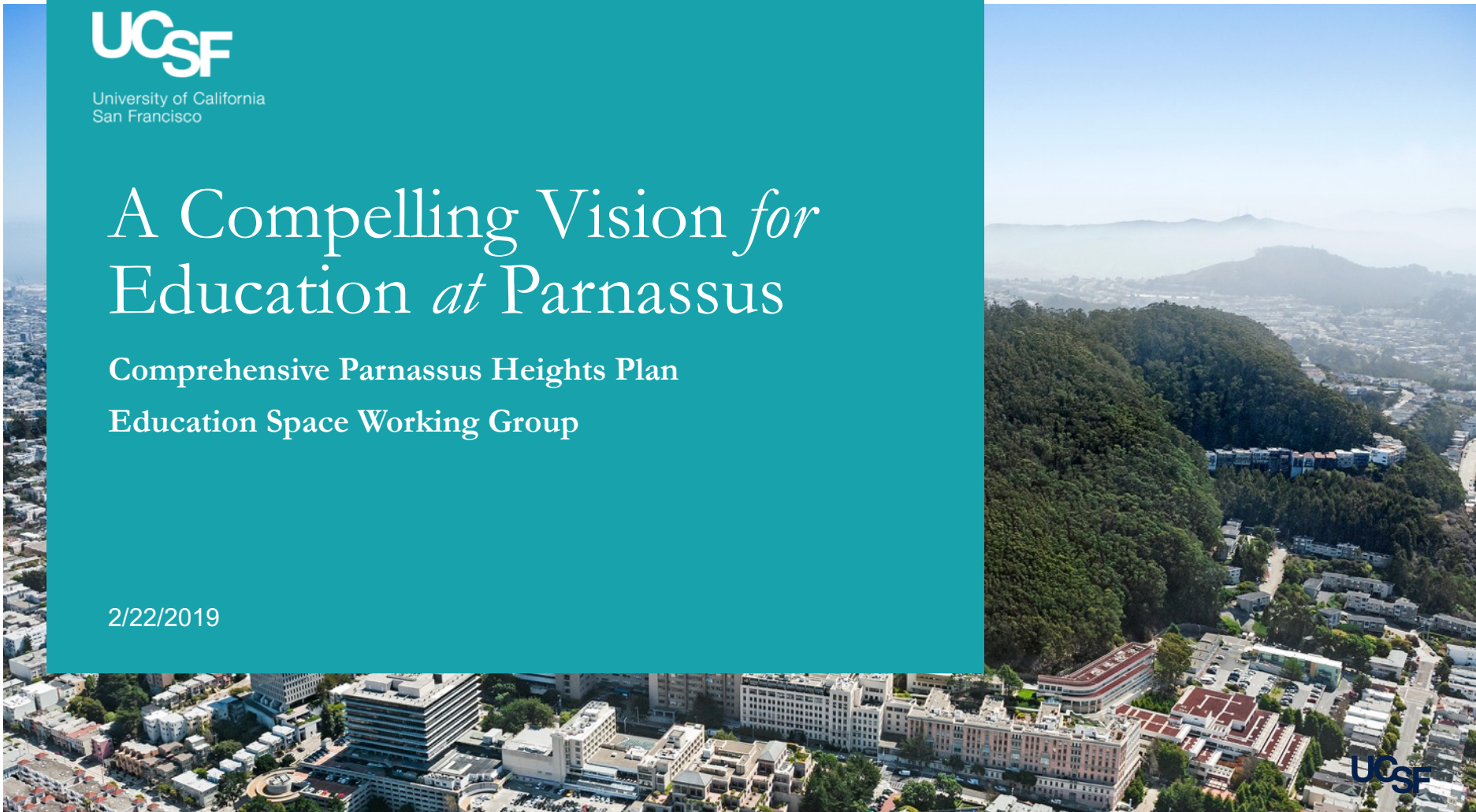
San Francisco

A Compelling Vision *for* Education *at* Parnassus

Comprehensive Parnassus Heights Plan

Education Space Working Group

2/22/2019




Education excellence is the catalyst for all UCSF missions.



We looked to the UCSF 2030 Education Space Values to frame our recommendations.

UCSF 2030 Education Space Values

Inquiry, innovation, and investigation

Interprofessional collaborative care





UCSF 2030 Education Space Values

Mentorship, connectivity, and networks of learning

Aligning education, research, and clinical care



UCSF 2030 Education Space Values

Continuous learning

Health and wellbeing

Diversity and inclusion

UCSF 2030 Education Space Values

Empowered and engaged patients and communities

PRIDE in our institution



Major Activities

The Education Space Working Group (ESWG):

- **Engaged with stakeholders in all education mission areas, including students.**
- **Adopted the *UCSF 2030 Education Space Values*.**
- **Developed *ESWG Education Space Guidelines* which should guide implementation of the recommendations.**
- **Issued a call for innovative education space proposals, which generated 14 responses, most targeting near-future needs.**
- **Worked with Perkins Eastman to evaluate the scope and utilization of current classrooms and recommend a revised portfolio.**

Working Group Roster

• **Chris Shaffer**	Library
• **Kim Baltzell**	Center for Global Health & School of Nursing
• **John Davis**	School of Medicine
• **Matt Epperson**	Student Academic Affairs
• **Marcus Ferrone**	School of Pharmacy
• **Amber Fitzsimmons**	School of Medicine & Graduate Division
• **Cara Fladd**	Space & Capital Planning
• **LaMisha Hill**	Office of Diversity and Outreach
• **Sara Hughes**	School of Dentistry
• **Kirby Lee**	School of Pharmacy
• **Chandler Mayfield**	School of Medicine
• **Lisa Magargal**	School of Medicine
• **Maureen Shannon**	School of Nursing
• **Kevin Souza**	School of Medicine
• **Hailey Taylor**	School of Dentistry
• **Michael Trevino**	School of Nursing
• **Sandrijn van Schaik**	Kanbar Center for Clinical Skills and Simulation & School of Medicine

Endorsements

We endorse a vision for education space in alignment with the Perkins Eastman "preferred alternative:"

- **A new education building east of the Library.**
- **Dorms and wellness on the west side.**
- **Clinical activities, including dentistry, on the east side.**
- **A research building west of Saunders Court.**
- **Streetscaping to reduce traffic on Parnassus Ave.**
- **Significant reduction in use of classrooms for meetings.**

Therefore, this report proposes spaces that support our education programs and human-centered design to support student life, well-being, and learning.

Endorsements

We endorse the recommendations of the Academic Senate Space Committee (Appendix E):

- **Academic Space for Clinicians Policy Task Force Report**
- **Educator and Education Space Policy Task Force Report**

Assumptions

This report assumes:

- **There will be no reduction in overall education space at Parnassus.**
- **Parnassus Avenue cannot be closed to traffic, but we imagine that it could and what a wonderful world it would be.**



Education Space Working Group Recommendations

UCSF

Space Recommendations

Create an innovative central **Education Core** to support active-learning and interprofessional pedagogies.

Expand **clinical simulation spaces** with comprehensive interprofessional skills and simulation capacities that can accommodate all school and UCSF Health needs.





Space Recommendations

Establish designated **academic areas for all in clinical buildings** in support of the education and research missions of UCSF.

Revise the portfolio of **classroom and class lab spaces to meet modern education** needs. Provide adequate spaces for campus meeting needs.

UCSF

Space Recommendations

Promote a vibrant community to academic support student life, well-being, and learning on our campus.

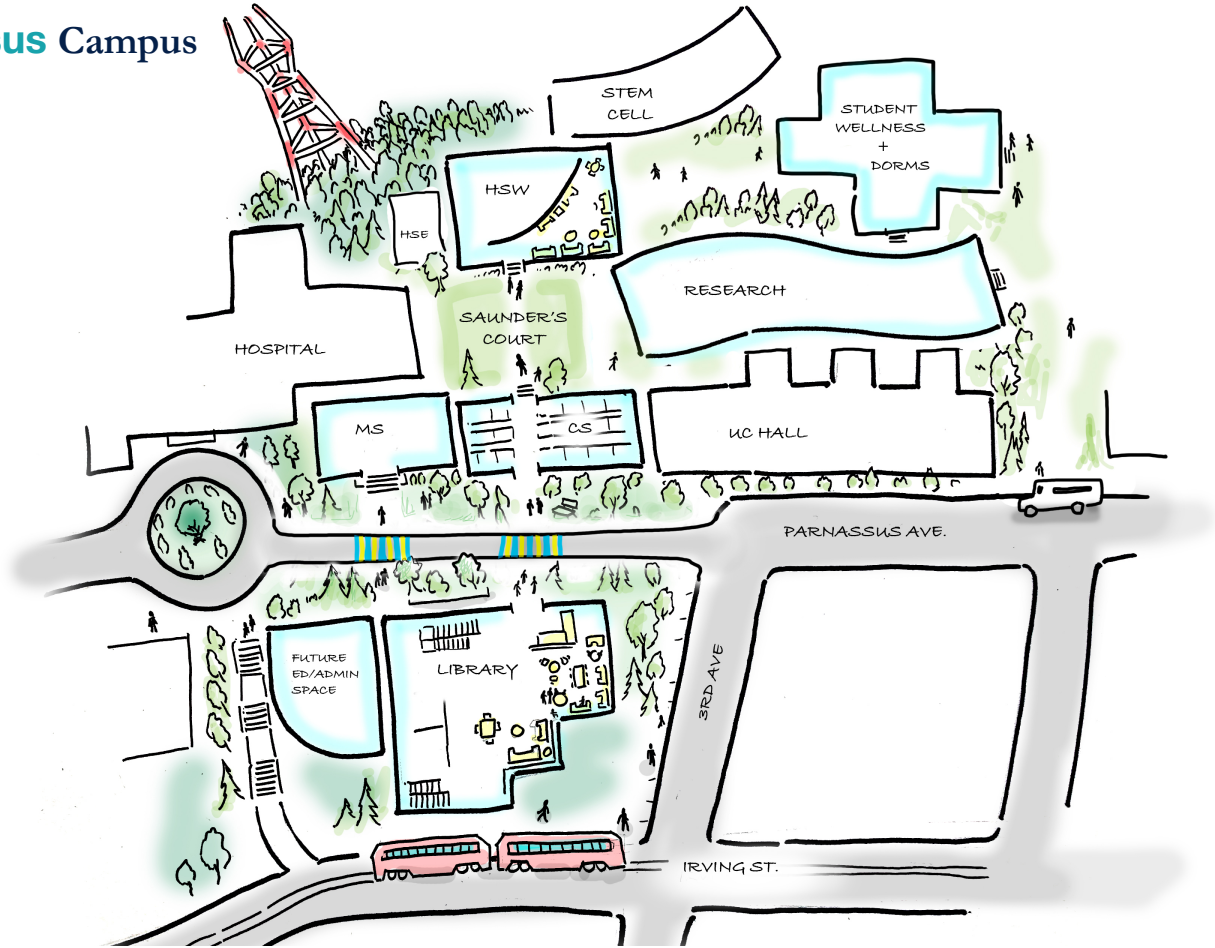




A Reimagined Teaching & Learning Experience

UCSF

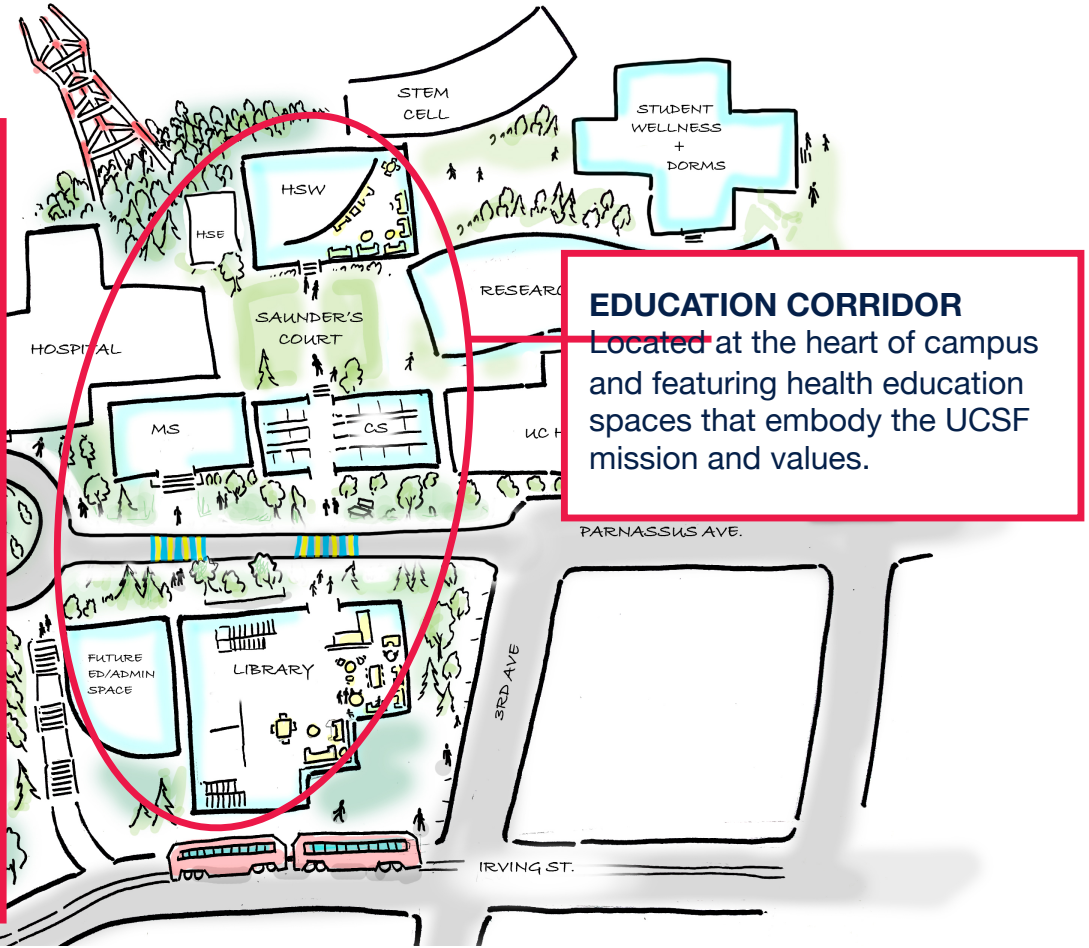
Future Parnassus Campus



Future Parnassus Campus

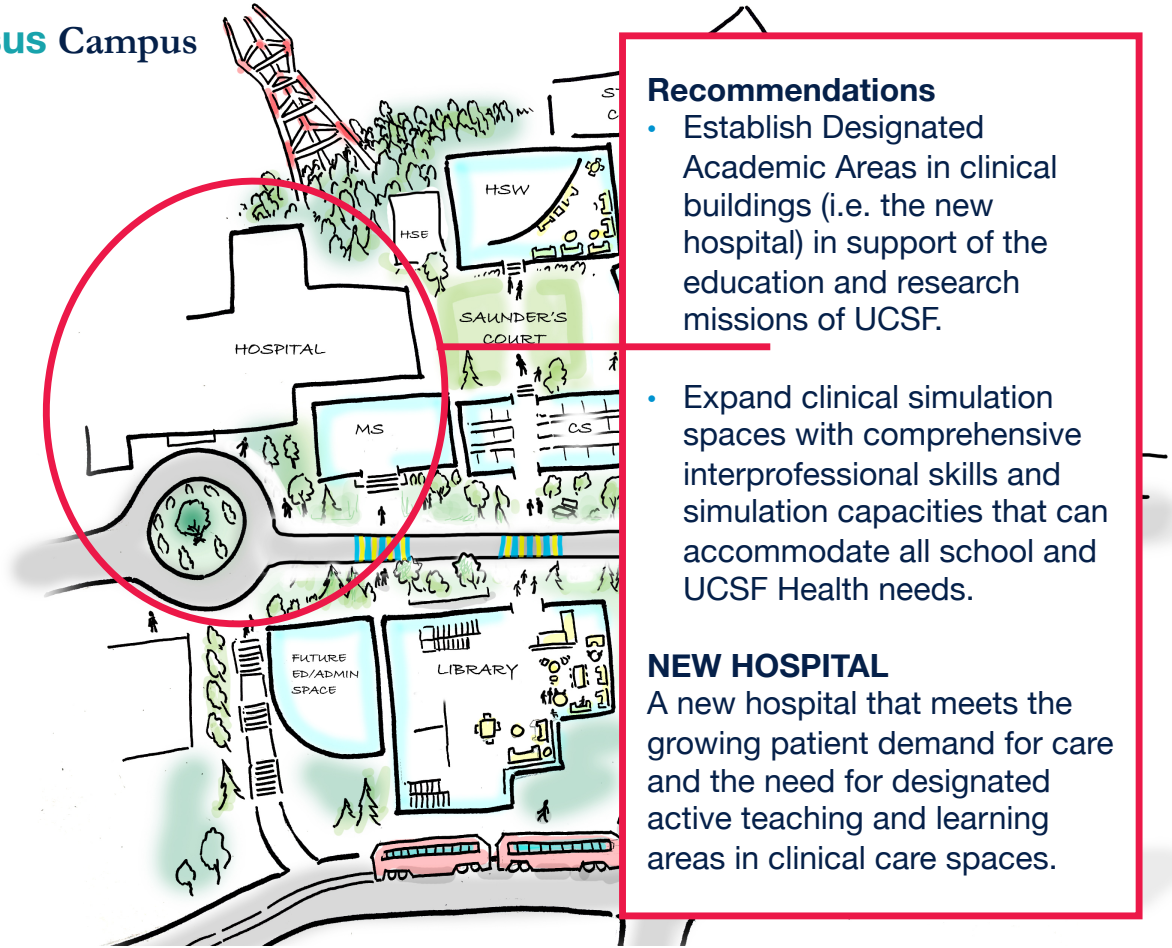
Recommendations

- Create an innovative central Education Core to support active-learning and interprofessional pedagogies.
- Revise the portfolio of classroom and class lab spaces to meet modern education requirements. Provide different spaces for campus meeting needs.
- Expand clinical simulation spaces with comprehensive interprofessional skills and simulation capacities that can accommodate all school and UCSF Health needs.



EDUCATION CORRIDOR
Located at the heart of campus and featuring health education spaces that embody the UCSF mission and values.

Future Parnassus Campus



Recommendations

- Establish Designated Academic Areas in clinical buildings (i.e. the new hospital) in support of the education and research missions of UCSF.
- Expand clinical simulation spaces with comprehensive interprofessional skills and simulation capacities that can accommodate all school and UCSF Health needs.

NEW HOSPITAL

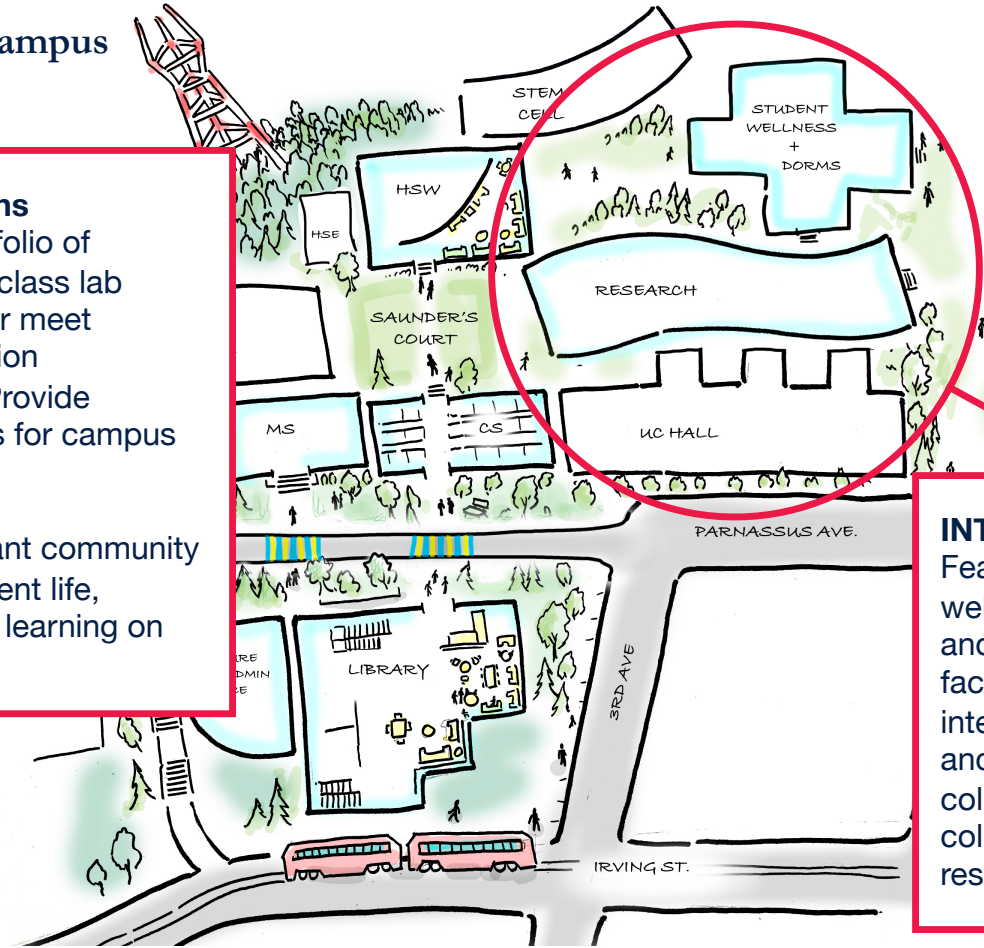
A new hospital that meets the growing patient demand for care and the need for designated active teaching and learning areas in clinical care spaces.

Future Parnassus Campus

Recommendations

- Revise the portfolio of classroom and class lab spaces to better meet
- modern education requirements. Provide different spaces for campus meeting needs.

- Promote a vibrant community to support student life, well-being, and learning on our campus.



INTERDISCIPLINARY SPACES
Featuring spaces that support wellbeing, student life, housing and research. These spaces facilitate interdisciplinary interactions between schools and programs, and collaborations between colleagues in clinical and research environments.


A place is only as good as the *people* in it.
Pittacus Lore

Educators & Learners at Parnassus



AUBREY
Graduate Student



MUTHAMMA
Research Faculty



BRIANNA
Clinical Student



SAMUEL
Clinical Faculty

Learner: Graduate Student



AUBREY
Pronouns: they/them/theirs
Status: First Year Biomed
Primary Campus: Parnassus
Time on Parnassus: 12 hours
Additional Info:
- Lives in student housing on Mission Bay Campus
- Volunteers at Carry the One Radio to be a part of a broader health and science community on campus

Pain Points

- **Spends the majority of time in lab** and misses student experience
- **Feels siloed** working with only graduate peers and program faculty
- **Hard time finding meeting rooms,** so regularly meets with mentor at Palios
- Has **consistent technology issues** in classrooms and meetings

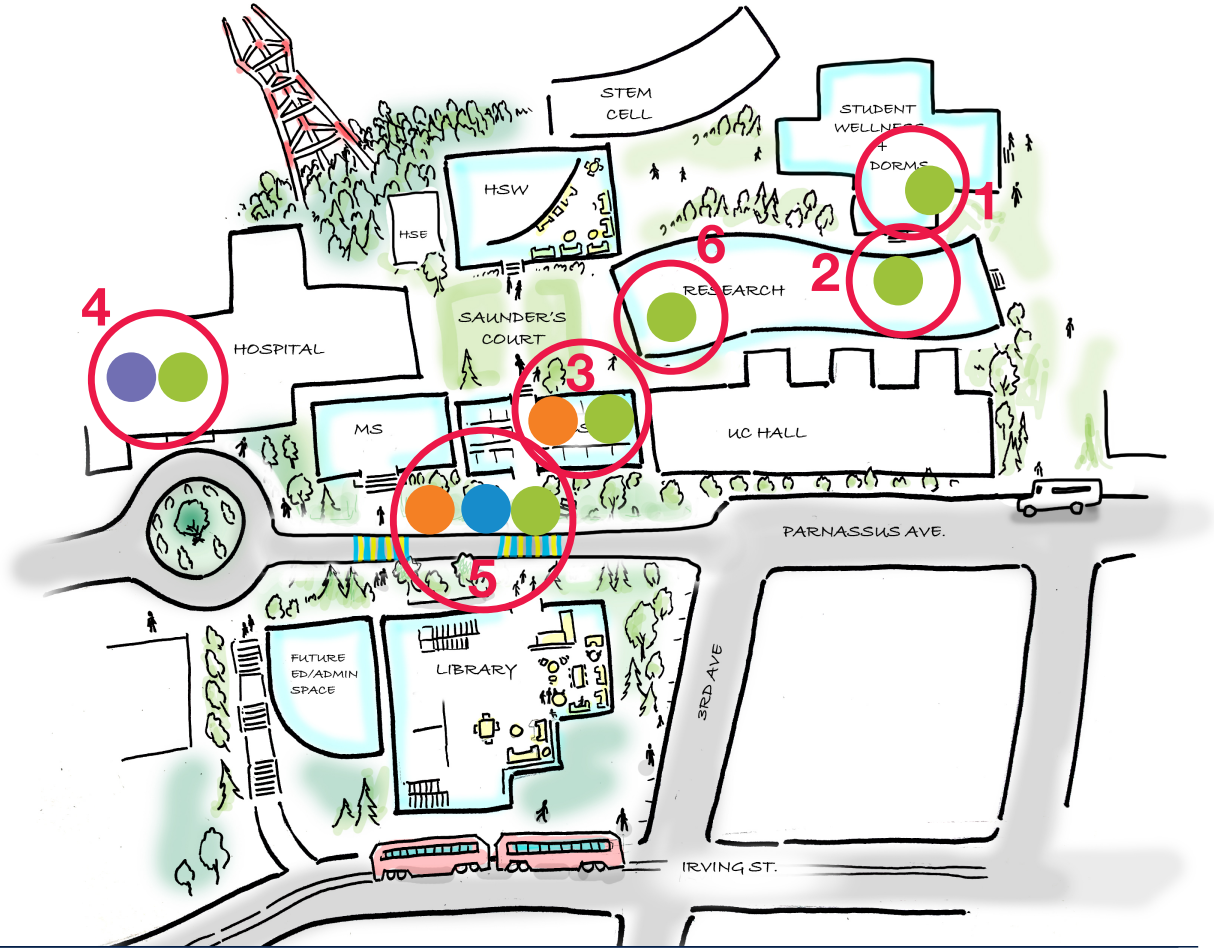
Needs

- Sense of **community**
- More **clinical problems to solve**
- More formal **interdisciplinary** learning and collaboration
- **Informal settings** to interact with faculty and peers
- **Bring classrooms up to date** with technology



AUBREY
Graduate Student
12 Hour Day

1) 6 am: Leaves dorm and goes to gym in Student Wellness Center.
Needs Met: Space to create community, health and well-being.
2) 7:05am: Works in lab with graduate and professional students.
Needs Met: Space for interdisciplinary learning and collaboration.
3) 9:10am: Meets with Brianna to discuss a new research project.
Needs Met: Space for Interprofessional collaboration.
4) 11:35am: Meets Samuel regarding collaboration on translational research.
Needs Met: Space for learning in hospitals.
5) 12:05pm: Checks in with Muthamma and Brianna on the quad and agrees to co-lead a multi-campus research elective.
Needs Met: Modern classrooms with advanced video-conferencing.
6) 1:30pm: Lab-based classes in research building. Meets with study group.
Needs Met: Modern lab-based teaching spaces and small group learning



Learner: Research Faculty



MUTHAMMA
Pronouns: she/her/hers
Status: Associate Professor
Primary Campus: Mission Bay
Time on Parnassus: 7.5 hours
Additional Info: Serves on two curriculum committees that regularly meet on Parnassus campus

Pain Points

- Always in search of **space to meet and take calls**
- Notices **outdated spaces that lack creativity** during every visit to Parnassus
- Sometimes **gets lost in buildings** when visiting Parnassus
- Consistently has **issues with Zoom** at Parnassus

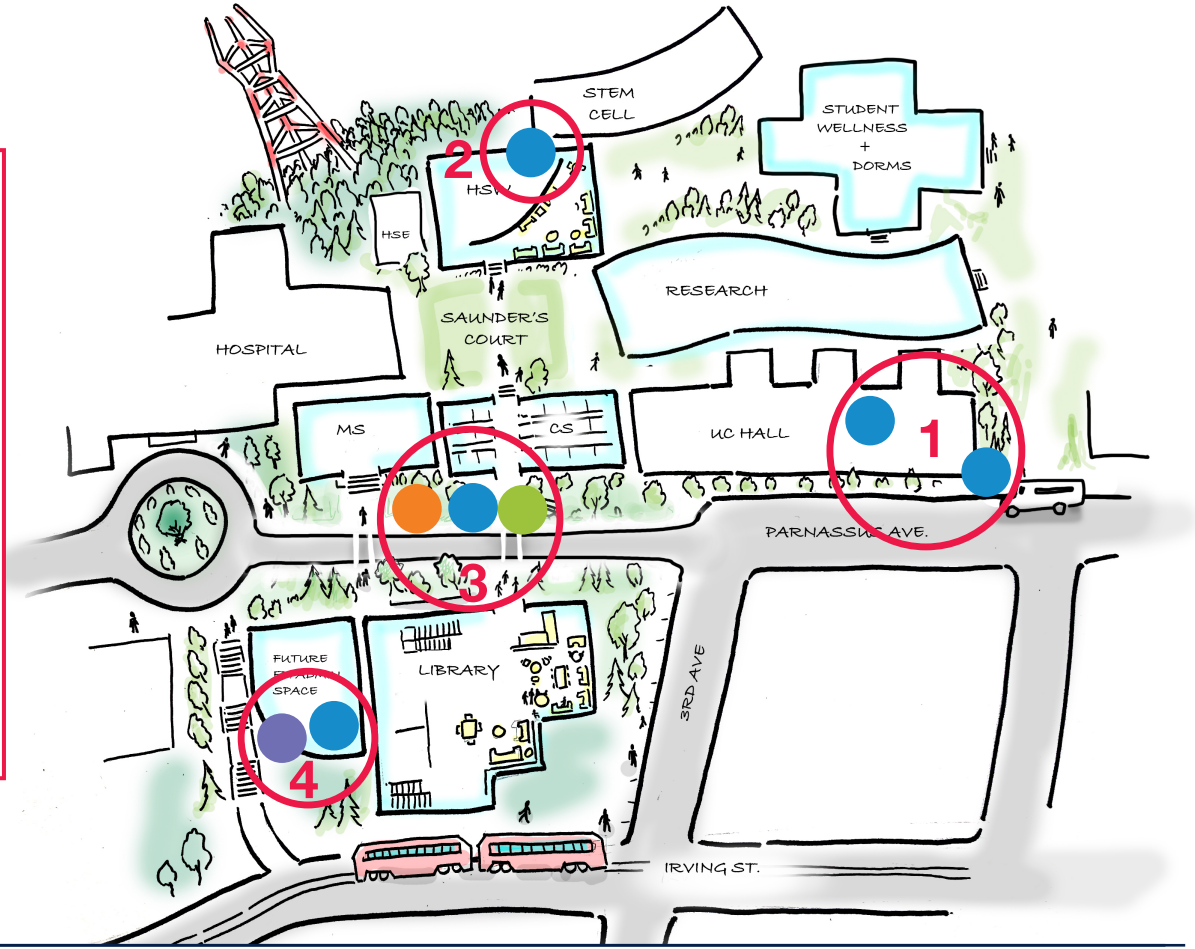
Needs

- **Update campus** to complement the Mission Bay campus
- More **flexible spaces to informally meet**
- More **art and color** to encourage creativity and inspiration
- Effective **signage**
- Modern classrooms with **advanced video conferencing**



MUTHAMMA
Research Faculty
7.5 Hour Day

1) 7am: Arrives at Parnassus via shuttle and heads to UC Hall for meeting.
Needs Met: Access to flexible meeting space.
2) 9am: Attend curriculum committee in HSW with remote access to Mission Bay.
Need Met: Advance technology for remote meetings.
3) 12:05pm: Checks in with Brianna and Aubrey on the quad and recruits them to co-lead a multi-campus research elective.
Needs Met: Modern classrooms with advanced video-conferencing.
4) 1pm: Visits the Faculty & Student Success Center to attend a diversity training. Meets up with Samuel afterwards to discuss a research project.
Need Met: Space for faculty training in a creative and inspiring space.



Learner: Clinical Student



BRIANNA
Pronouns: she/her/hers
Status: Second Year Pharmacy
Primary Campus: Parnassus
Time on Parnassus: 10 hours
Additional Info:

- Always in class. When not in class, studies alone and with peers in the Library
- Serves as officer on the Graduate and Professional Student Association

Pain Points

- Has difficulty finding **spaces to meet and work with groups**
- Hard time finding **outlets to charge** laptop and phone
- Wants more **comfortable and welcoming areas** on campus.
- Reluctantly takes **medication for anxiety**, particularly **during exams**

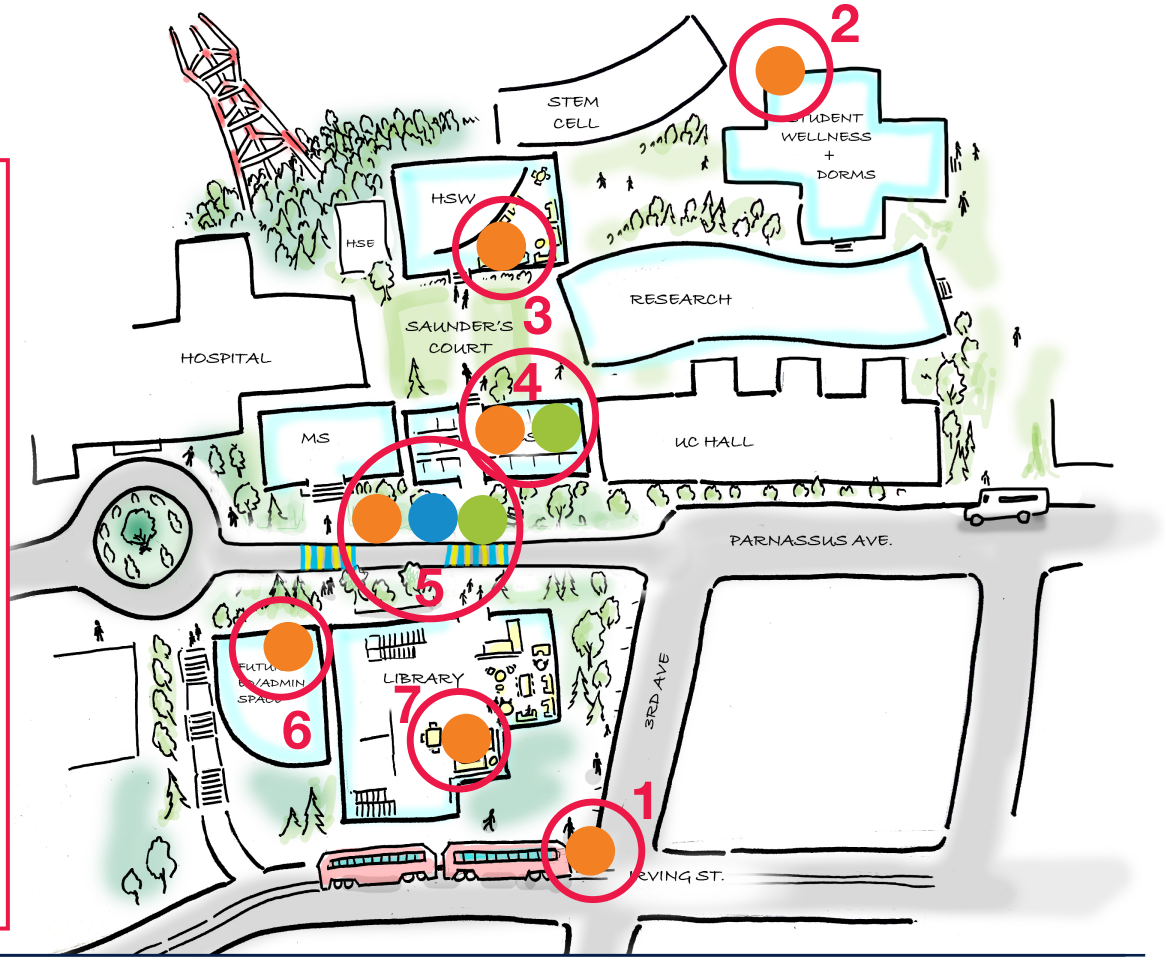
Needs

- **Modular spaces** to get work done individually and collaboratively
- More spaces to **accommodate technology**
- Living room space for **informal learning, community, and study**
- Prioritize and offer more services for **student wellness**



BRIANNA
Clinical Student
10 Hour Day

1, 2) 6:50am: Arrives on Muni to attend morning yoga class in Student Wellness Center.
Needs Met: Space for wellness activities.
3) 8:30am: Eats breakfast at HSW Redwood Terrace before a meeting.
Needs Met: Living room space for informal learning, community, and study on south end of campus.
4) 9:10am: Meets with Aubrey to work on a collaborative research project in the new CSB.
Needs Met: Modern classrooms and access to natural light.
5,6) 12:05pm: Checks in with Muthamma and Aubrey on the quad and agrees to co-lead a multi-campus research elective. Enjoys lunch on the plaza with friends.
Needs Met: Modern classrooms with advanced video-conferencing; community space
7) 1:05pm: Studying for Therapeutics class. Meet-up with other pharmacy students for a consultation with a librarian.
Needs Met: Modular spaces to get work done individually and collaboratively.



Educator: Clinical Faculty



SAMUEL
Pronouns: he/him/his
Status: Professor & Surgeon
Primary Campus: Parnassus
Time on Parnassus: 16 hours
Additional Info:
- Comes in early and leaves late
- Interested in applying new technology to surgical procedures
- 3D prints anatomy models in Makers Lab for teaching

Pain Points

- Few clinicians engaging in **new technology**
- **No surgical skills lab in hospital** for team and student training
- **Minimal collaboration** with simulation experts
- Hard to find **private meeting spaces**
- **Not much interaction** beyond hospital

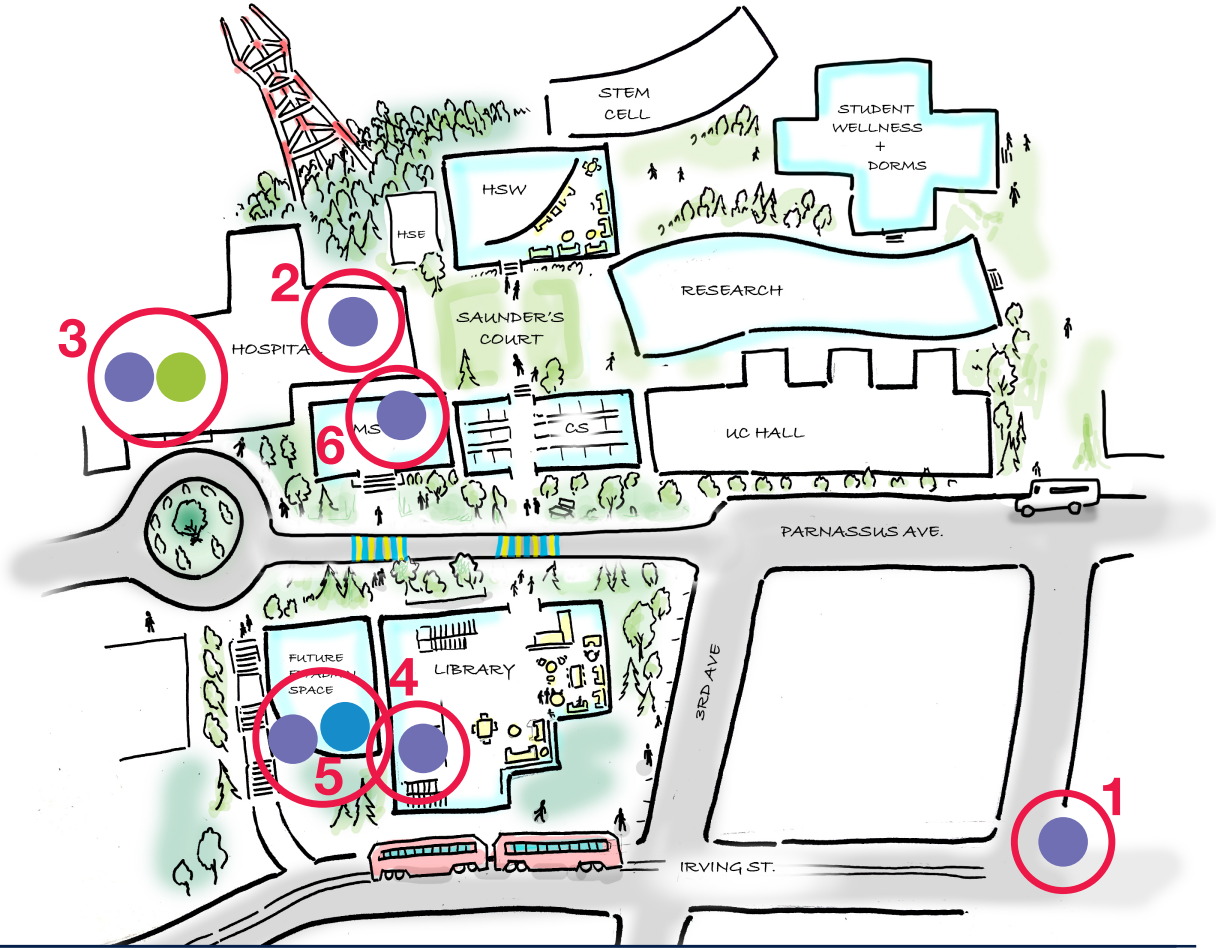
Needs

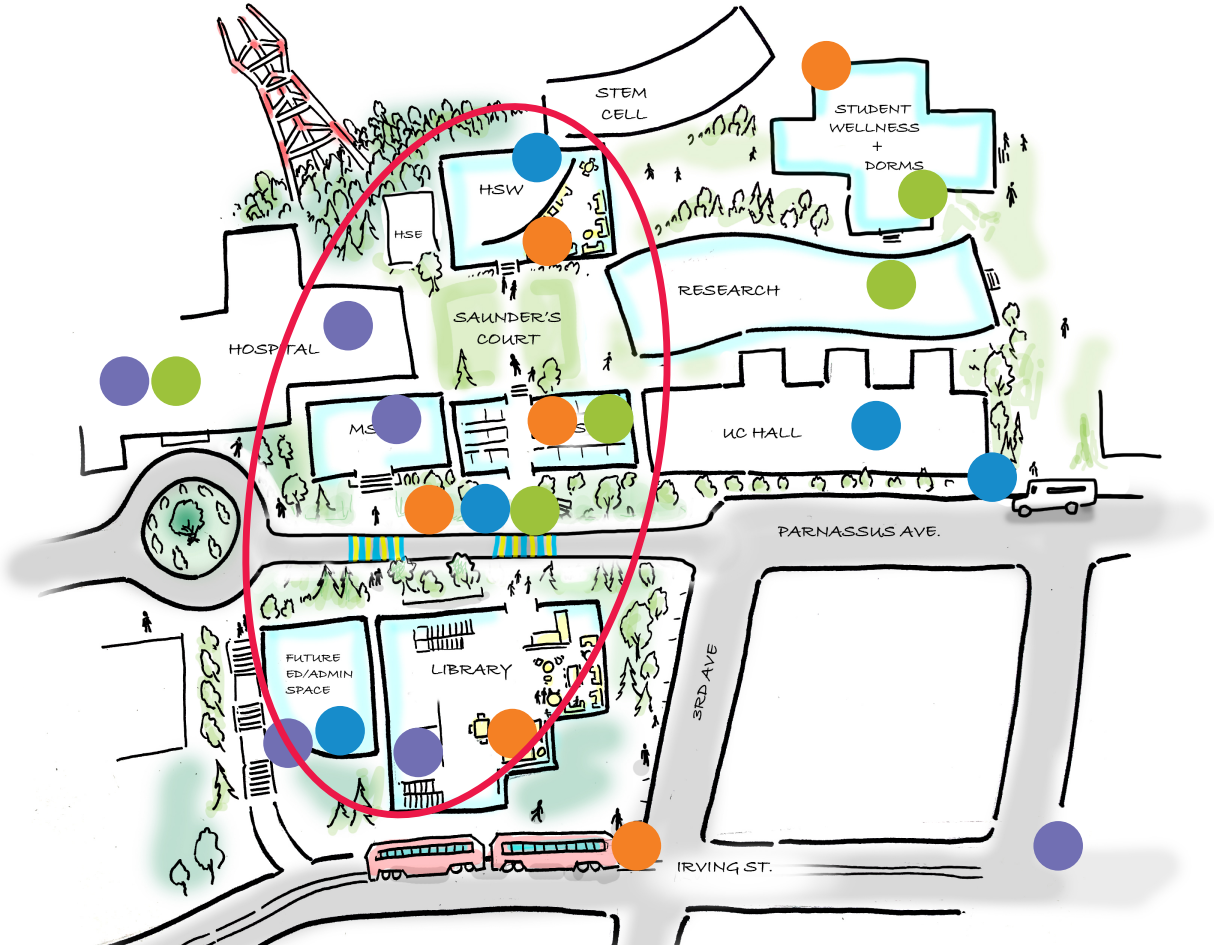
- **Designated academic areas** in hospital
- Greater capacity for **surgical simulation**
- More private and accessible **meeting spaces** throughout campus
- Space to facilitate **interactions outside of the hospital**

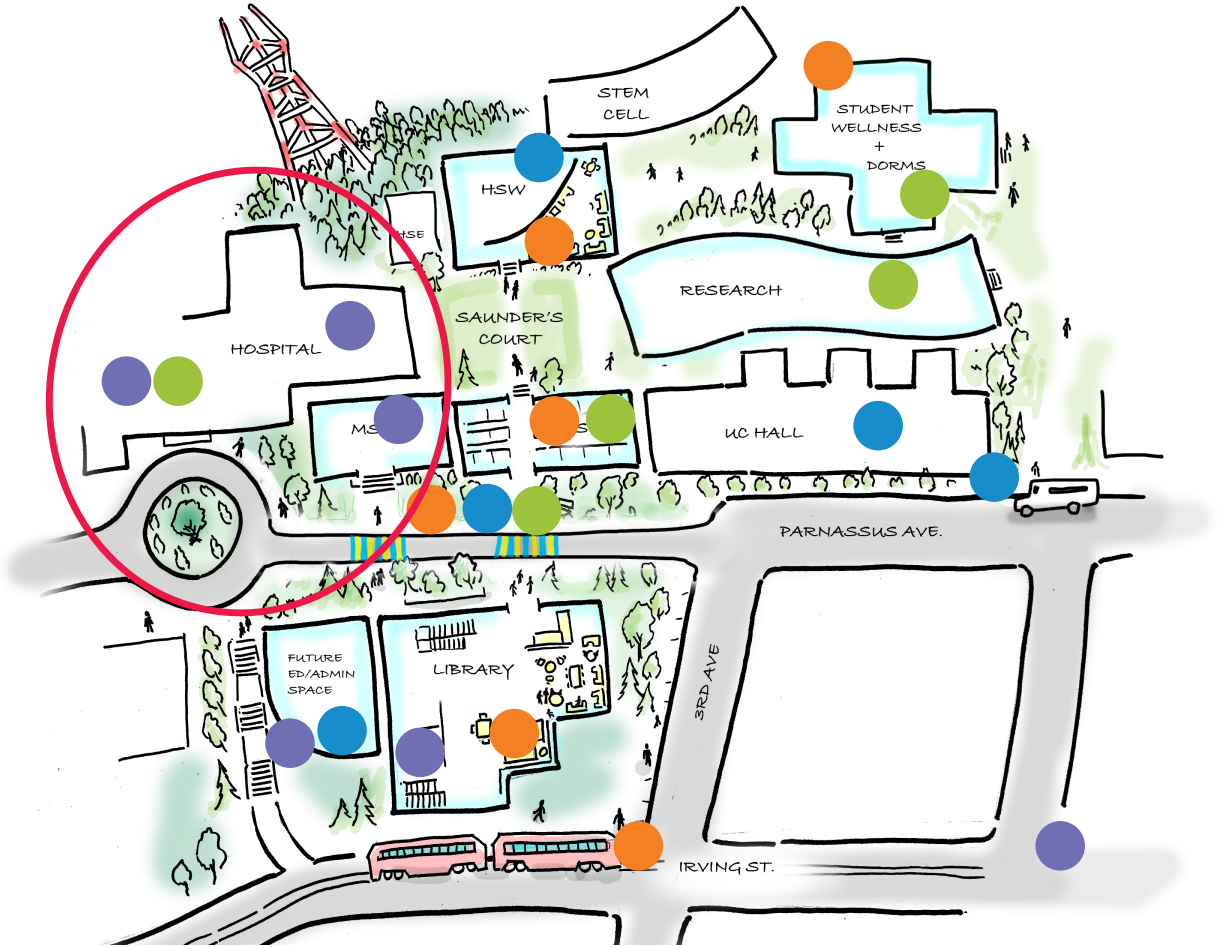


SAMUEL
Clinical Faculty
16 Hour Day

1, 2) 5:30am: Arrives on bike and heads to surgical skills simulation space in hospital.
Need Met: Greater capacity for simulation.
3) 11:35am: Meets Aubrey regarding collaboration on translational research.
Needs Met: Space for academic activities in hospitals.
4) 12:30pm: Grabs coffee and runs into colleague before heading to meeting.
Need Met: Space to facilitate interactions outside of the hospital.
5) 1:05pm: Visits the Faculty & Student Success Center to attend a diversity training. Meets up with Muthamma afterwards to discuss a research project.
Need Met: Space for faculty training in a creative and inspiring space. Faculty meeting space.
6) 2:35pm: Meets with residents in surgical skills simulation space for teaching session.
Need Met: Space for academic activities in the hospital.




STEM
CELL
STUDENT
WELLNESS
+
DORMS
HSW
HSE
RESEARCH
SAUNDER'S
COURT
HOSPITAL
UC HALL
PARNASSUS AVE.
FUTURE
ED/ADMIN
SPACE
LIBRARY
3RD AVE
IRVING ST.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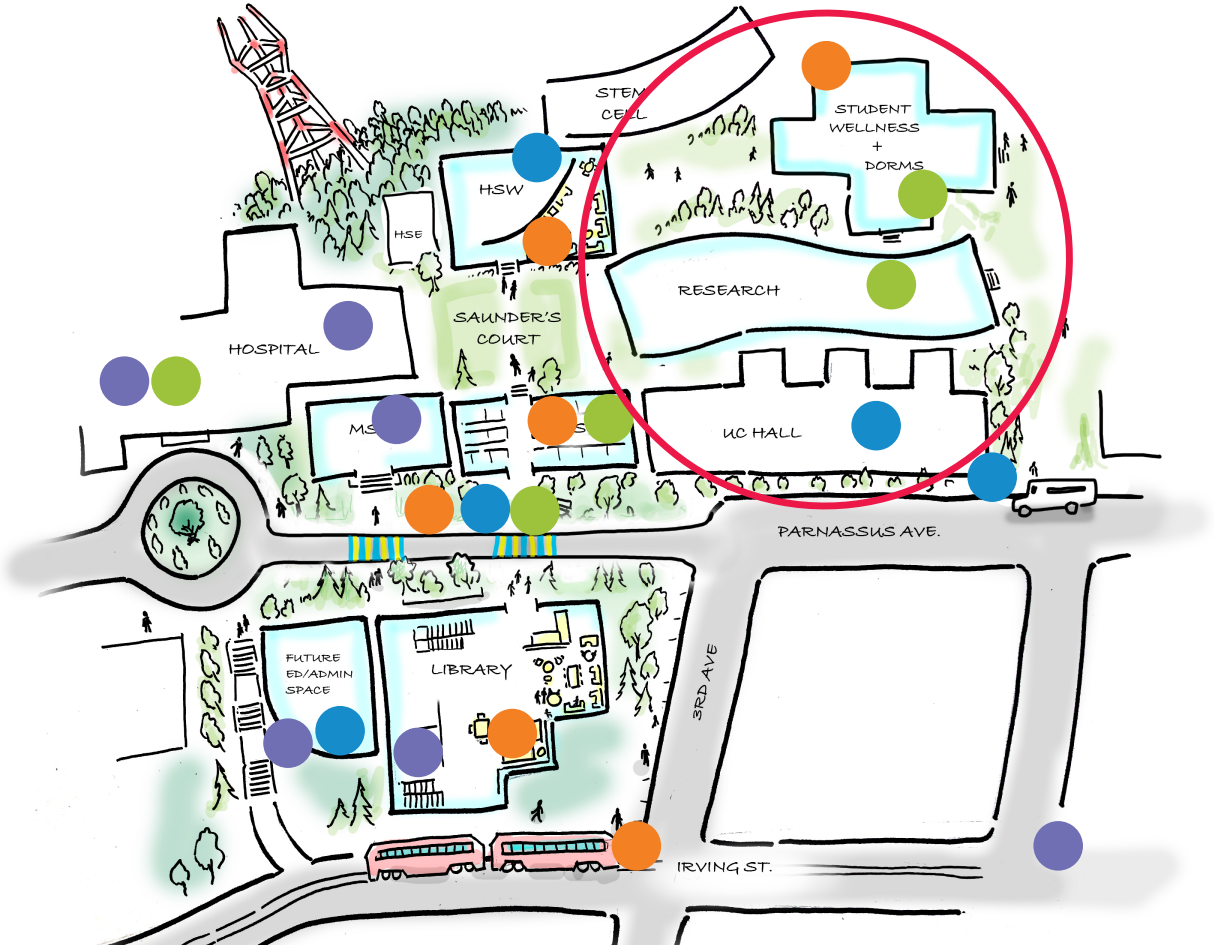
STEM CELL
STUDENT WELLNESS + DORMS
HSW
HSE
RESEARCH
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HOSPITAL
UC HALL
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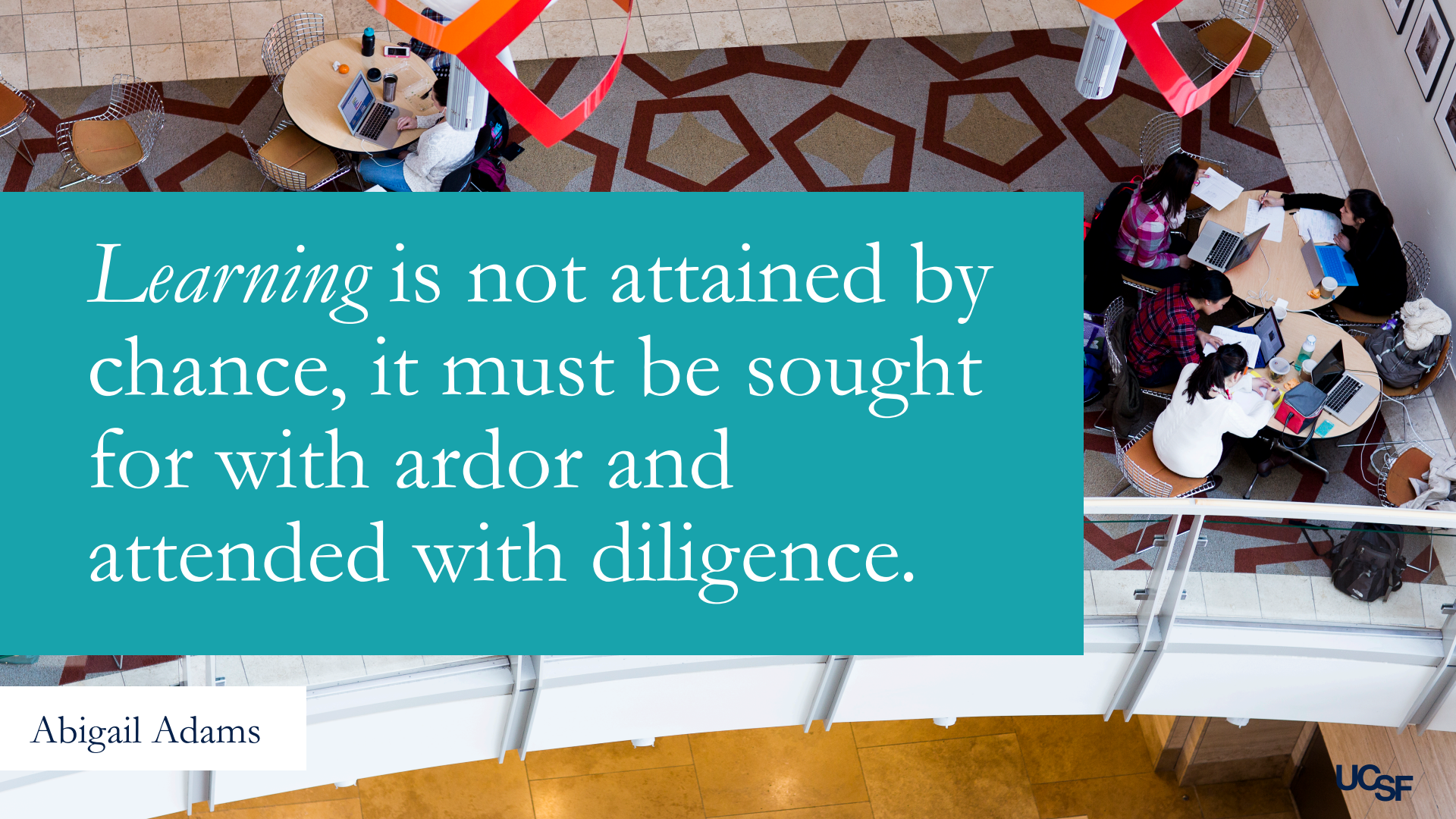
FUTURE ED/ADMIN SPACE
LIBRARY
3RD AVE
IRVING ST.



Learning is not attained by chance, it must be sought for with ardor and attended with diligence.

Abigail Adams

UCSF

Appendices

A. Education Community Proposals

B. Kanbar Center for Simulation – Expansion of Facilities Space Needs

C. Designated Academic Areas

D. Perkins Eastman Classroom Portfolio Recommendations

E. Academic Senate Space Committee Reports

F. ESWG Education Space Guidelines

G. Library Education Space Principles

Space Recommendations

- Create an innovative central Education Core to support active-learning and interprofessional pedagogies.
- Expand clinical simulation spaces with comprehensive interprofessional skills and simulation capacities that can accommodate all school and UCSF Health needs.
- Establish designated academic areas for all in clinical buildings in support of the education and research missions of UCSF.
- Revise the portfolio of classroom and class lab spaces to meet modern education requirements. Provide adequate spaces for campus meeting needs.
- Promote a vibrant community to support student life, well-being, and learning on our campus.

UCSF

UCSF Health

Hospital 2030 Facility Sizing
Parnassus Heights Community Planning

June 12, 2020

Summary: UCSF New Hospital Sizing

1. The forecasted growth in population and changes in utilization trends in the bay area will mean a corresponding growth in inpatient admissions
2. High acuity/complex admissions (for example cancer and neurosurgery) will drive a good portion of the inpatient growth. These admissions will be concentrated at a small number of medical centers with the equipment and staff capable of caring for complex patients. These types of cases are critical to the tripartite mission of research, education, and patient care delivered by UCSF.
3. The existing volume of inpatient admissions at UCSF Parnassus are understated due to capacity constraints preventing patient transfers and scheduling of surgical cases. Expansion of inpatient capacity which will allow us to treat these patients, will drive a need for a larger hospital footprint than we have today.

An Evolving Market: Bay Area Population Trends

Substantial population growth is expected in the 9-County Bay Area over the next 5 years

Age Groups	Market 2020 Population	Market 2025 Population	Market Population % Change
00-17	1,591,065	1,619,311	1.78%
18-44	2,912,554	2,890,424	(0.76 %)
45-64	2,057,361	2,140,360	4.03%
65-UP	1,240,545	1,460,621	17.74%
Total	**7,801,525**	**8,110,716**	**3.96 %**

- The Bay Area population has grown steadily over the last 10 years (1% per year); growth is expected to continue at a similar pace.
- According to Claritas, the Bay Area population is expected to grow from an estimated 7.8M in 2020 to 8.1M by 2025.
- Growth is expected to be much greater in the older populations, with 65+ growing almost 18% during this period, much faster than the younger age groups.

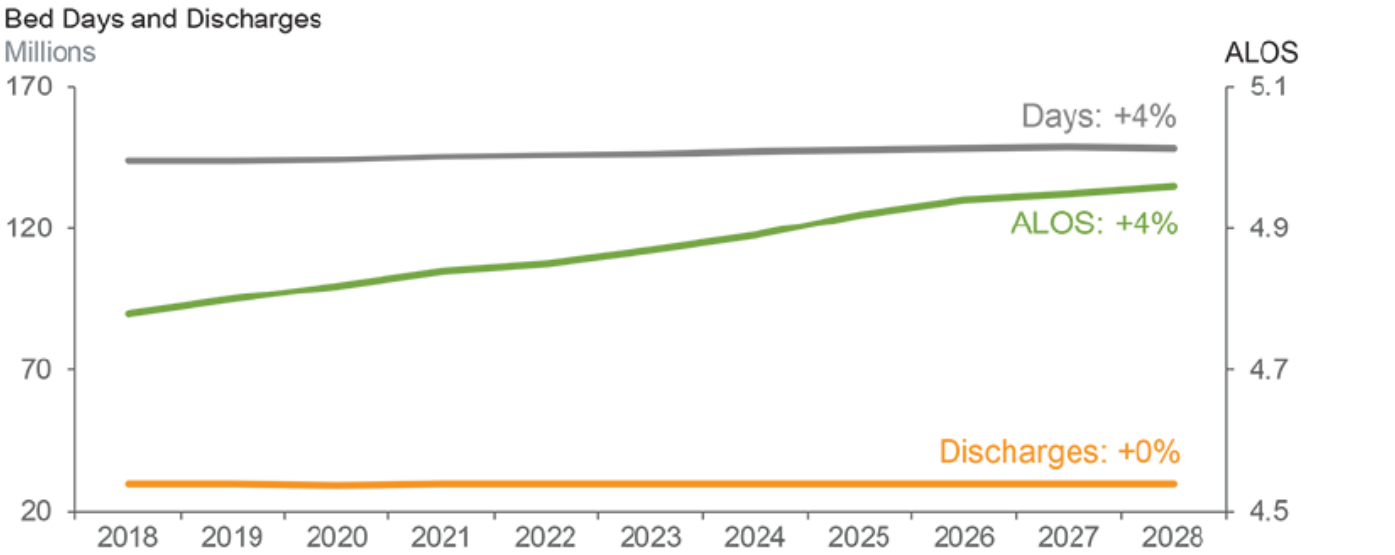
UCSF

Complex Case Length of Stay National Forecast

Demographic changes over the next 10 years, including an increase in national Medicare enrollment will increase the acuity and length of stay of patients seen.

- 31% increase in the Medicare Population over the next 10 years
- Increase in medical complexity of patients coming to the hospital as less complex cases transition to outpatient
- Higher complexity will mean longer length of stay for each admission and greater bed need

Discharges, Total Days and ALOS Forecast
2018–2028



Note: Forecast excludes 0–17 age group. **Sources:** Impact of Change®, 2018; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2015. Agency for Healthcare Research and Quality, Rockville, MD; Claritas Pop-Facts®, 2018; Sg2 Analysis, 2018.

UCSF

Inpatient Bed Demand at UCSF

Since 2014, UCSF has had significant inpatient volume growth driven by increases in adult complex care. This growth, though significant would have been even higher if adequate capacity was available at UCSF to accept these transfers. The growth of complex care demand is driving the need for additional beds.

Service Line	Cases Parnassus 2019	Medically Appropriate Transfer Cases Turned Away 2019	UCSF Requested volume 2019	Compound Growth Rate 2019-2030	Cases Parnassus 2030	2030 Bed Need	UCSF Compound Historical Growth Rate 2014-2018
Adult Cancer	4,335	63	4,398	0.4%	4,544	136	
Cardiovascular	2,739	257	2,996	3.0%	3,802	113	
Medicine	6,233	111	6,344	2.1%	7,857	194	
Neurosciences	2,059	243	2,302	5.1%	3,546	84	
Orthopedics	1,614	113	1,727	3.5%	2,369	24	
Other	480	166	646	0.0%	480	6	
Surgery	1,273	184	1,457	0.8%	1,385	33	
Transplant	1,913	48	1,961	2.5%	2,508	47	
Spine	1,680		1,680	0.3%	1,730	34	
All Services	22,326	1185	23,511	1.7%	28,221	671	4.30%

- Model assumes a significantly lower compound growth rate through 2030 than UCSF has experienced over the last five years.
- Bed need based on growth from actual volume, rather than total requested volume.

Requested Volume: Medically appropriate transfers requested plus inpatient cases Parnassus.

UCSF Health


UCSF Health
Redefining possible.™

Appendix TRANS
Transportation Appendix

Traffic Operations Considerations

Consistent with the CEQA Guidelines and the *SF Guidelines*, the transportation impact analysis in *Section 4.15, Transportation*, of this EIR analyzes the change in VMT per capita that would result from the implementation of the Comprehensive Parnassus Heights Plan (CPHP or Plan) at the Parnassus Heights campus site. Changes to traffic operations in the study area (i.e., the level of service of project area intersections) and transit operations (e.g. project generated transit ridership and effect on capacity utilization, potential delay to transit vehicles) are outside the scope of the CEQA analysis and are not discussed in *Section 4.15, Transportation*. An analysis of the changes to traffic and transit operations has, however, been completed and is presented below for informational purposes only. This analysis is provided for decision-makers' consideration, independent of the environmental review process.

This appendix describes traffic operations considerations related to the CPHP. The study area and campus site that are the subject of this discussion are shown on **Figure 4.15-1** (see *Section 4.15, Transportation*).

First, local traffic operations during the weekday PM peak period (4:00 PM to 6:00 PM) are discussed, which characterize the time of day when there is the most concentrated demand for travel. The weekday PM peak period analysis is based on existing traffic volumes and Level of Service ("LOS") calculations, as well as traffic volume estimates for Existing Plus CPHP conditions. Next a discussion of local traffic operations during the daytime period (between 7:00 AM and 7:00 PM) is presented to illustrate how operations centered on Parnassus Avenue generally fluctuate over the course of the day, beyond the PM peak hour period. This discussion is based on existing parking garage activity data and Parnassus Avenue vehicle volume data collected between 7:00 AM and 7:00 PM. The local traffic operations sections then inform a discussion of the potential effects of traffic operations on multimodal operations – including for people walking, biking, or taking transit – throughout the day, beyond the PM peak hour period.

This appendix also includes a discussion of cumulative traffic operation conditions, which represent implementation of the CPHP in combination with past, present, and reasonably foreseeable future projects in the vicinity of the campus site. Cumulative volumes were developed based on the San Francisco Chained Activity Model Process (SF-CHAMP) travel demand forecasting model.

Local Traffic Operations – Weekday PM Peak Period (4:00-6:00 PM)

Intersection operating conditions at the 17 intersections shown on **Figure 1** were evaluated during the weekday PM peak period (4:00 PM to 6:00 PM). Twelve of the 17 intersections are located within or immediately adjacent to the campus site on Kirkham Street, Parnassus Avenue, or Irving Street. These intersections were evaluated using the metric Level of Service ("LOS"), which is a qualitative description of driver comfort and convenience. Typical factors that affect motorized vehicle LOS include speed, travel time, traffic interruptions, and freedom to maneuver. This analysis was prepared for informational purposes only, as vehicle delay which is reflected in LOS analysis is no longer considered under CEQA in determining if a project results in significant environmental impacts.

The study intersections were evaluated using the Highway Capacity Manual (HCM) 6th Edition methodology, which is the prevailing standard used throughout the United States and is used in this study. For signalized intersections, this methodology determines the capacity for each lane group approaching 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, operations are defined by the average control delay per vehicle (in seconds per vehicle) for each stop-controlled movement or movement that must yield the right-of-way, and the LOS is determined by the worst (highest average delay) approach. Generally, the delay ranges for each LOS are lower for unsignalized intersections than for signalized intersections because drivers expect less delay at unsignalized intersections. Intersection LOS range from LOS A, which indicates free flow or excellent vehicle flow conditions with short delays, to LOS F, which indicates congested or overloaded vehicle flow conditions with long delays. In San Francisco, LOS A through D have historically been considered acceptable, and LOS E and LOS F have historically been considered unsatisfactory service levels. **Table** below summarizes the relationship between average delay per vehicle and LOS for signalized and unsignalized intersections according to the HCM 6th Edition method.

TABLE 1
INTERSECTION LOS CRITERIA

Description	LOS	Average Control Delay (seconds per vehicle)	
		Unsignalized Intersections	Signalized Intersections
Represents free flow. Individual users are virtually unaffected by others in the traffic stream.	A	≤ 10	≤ 10
Stable flow, but the presence of other users in the traffic stream begins to be noticeable.	B	> 10 to 15	> 10 to 20
Stable flow, but the operation of individual users becomes significantly affected by interactions with others in the traffic stream.	C	> 15 to 25	> 20 to 35
Represents high-density, but stable flow.	D	> 25 to 35	> 35 to 55
Represents operating conditions at or near the capacity level.	E	> 35 to 50	> 55 to 80
Represents forced or breakdown flow.	F	> 50	> 80

SOURCE: *Highway Capacity Manual 6th Edition,* Transportation Research Board of the National Academies of Science, 2017.



Parnassus Heights Campus Boundary

Study Intersections

Figure 1

Parnassus Campus Study Intersections

The PM peak period is generally chosen for study as it represents the time of day when there is the most concentrated demand for travel, which can lead to congested conditions. The *2014 UCSF Long Range Development Plan* (*2014 UCSF LRDP*) analyzed traffic conditions for both the AM peak period and PM peak period. In the existing conditions scenario analyzed under the *2014 UCSF LRDP*, study intersections generally operated similarly – or worse – during the PM peak period compared to the AM peak period; 19 of the 23 study intersections analyzed had the same or worse LOS rating during PM peak period compared to AM peak period. Therefore, the CPHP traffic operation analysis for informational purposes focuses on the PM peak period.

Existing Conditions

Traffic volumes and lane configurations during the PM peak hour for each of the 17 study intersections are shown in **Figure 2**. As shown in **Table 1**, all of the 17 study intersections operate at LOS D or better during the PM peak hour.

TABLE 1
EXISTING PM PEAK HOUR INTERSECTION LEVEL OF SERVICE (LOS)

Intersection	Traffic Control[a]	Delay (seconds)[b]	LOS[c]
1. Kirkham Street / Seventh Avenue	Signal	44	D
2. Kirkham Street / Fifth Avenue	AWS	<10 (<10, SB)	A (A, SB)
3. Judah Street / Seventh Avenue	Signal	22	C
4. Judah Street-Parnassus Avenue / Fifth Avenue	SSS	32 (SB)	D (SB)
5. Parnassus Avenue / Fourth Avenue	AWS	20 (25, WB)	C (D, WB)
6. Parnassus Avenue / Third Avenue	SSS	18 (SB)	C (SB)
7. Parnassus Avenue / Hillway Avenue	SSS	22 (NB)	C (NB)
8. Parnassus Avenue / Medical Center Way / Hill Point Avenue	SSS	17 (NB)	C (NB)
9. Parnassus Avenue / Stanyan Street	Signal	17	B
10.Irving Street / Fourth Avenue	Signal	16	B
11. Irving Street / Second Avenue	AWS	<10 (<10, WB)	A (A, WB)
12. Irving Street / Arguello Boulevard	SSS	24 (NB)	C (NB)
13. Lincoln Way / Seventh Avenue	Signal	23	C
14. Lincoln Way / Fourth Avenue	SSS	17 (NB)	C (NB)
15. Johnstone Drive / Clarendon Avenue	SSS	12 (SB)	B (SB)
16. Clayton Street / 17th Street	Signal	46	D
17. Oak Street-Fell Street-Kezar Drive / Stanyan Street	Signal	35	D

a AWS = All-way stop controlled; SSS = Side Street stop controlled; Signal = Signal controlled
b Delay reported as seconds per vehicle. For signalized intersections, a combined weighted average delay for the various movements within the intersection is reported. For SSS intersections, the highest average delay for an approach is reported. For AWS intersections, the combined weighted average delay of the intersection is reported, followed by the highest average delay for an approach (indicated in parentheses).
c For signalized intersections, LOS based on average intersection delay, based on the methodology in the *Highway Capacity Manual*, 2000. For SSS intersections, LOS is based on the worst approach. For AWS intersections, LOS is based on average intersection delay, and the LOS based on the worst approach is presented in parentheses.
Source: Fehr & Peers, 2020.

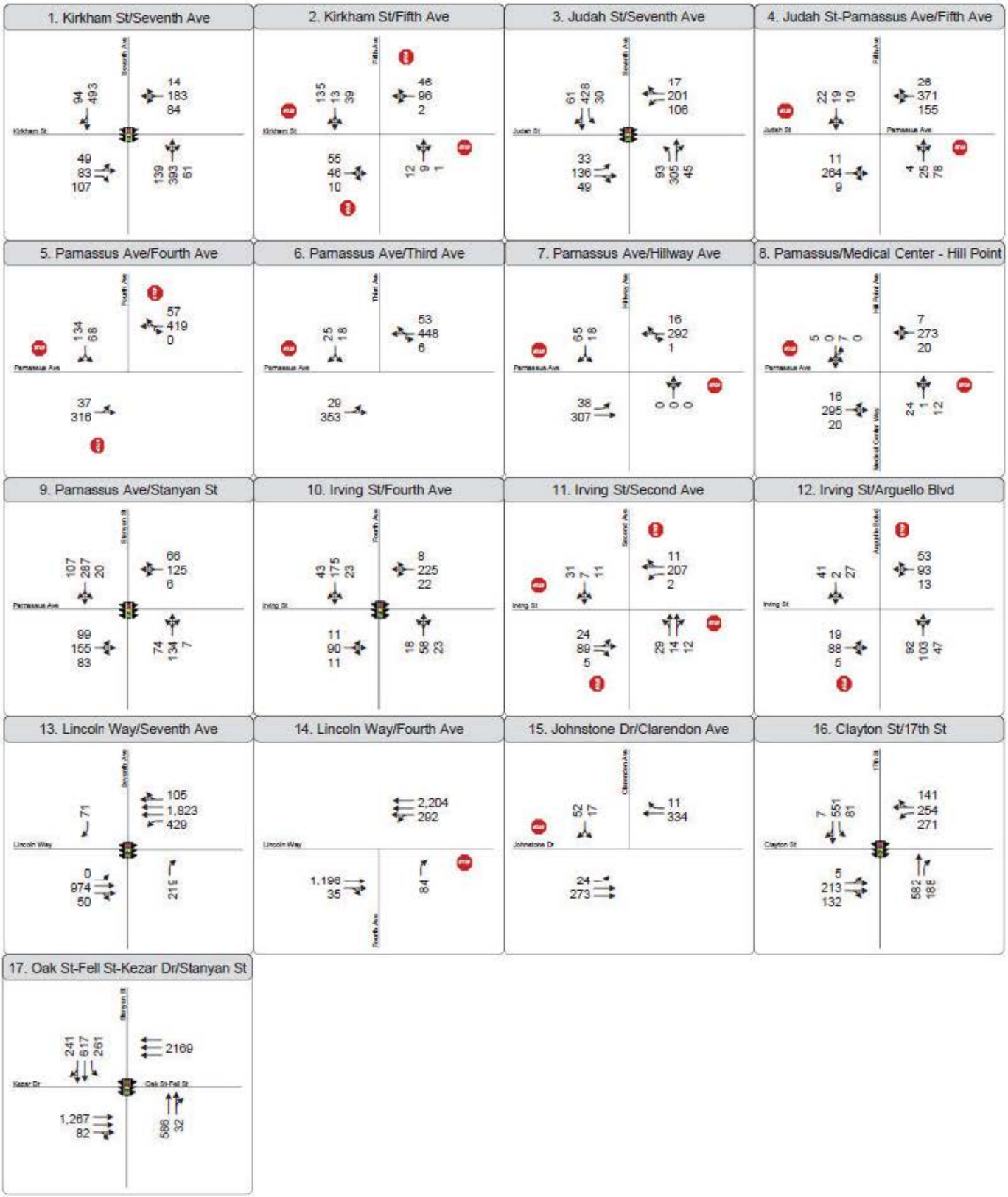


Figure 2

PM Peak Hour Traffic Volumes and Lane Configurations

Existing Plus CPHP Conditions

In order to estimate intersection turning movement volumes associated with the CPHP, a trip assignment analysis was conducted based on the travel demand estimates described in *Section 4.15, Transportation* (see "Travel Demand Estimates" section). Table 2 presents a comparison of daily and PM peak hour vehicle trips associated with the campus site under existing conditions and those associated with full implementation of the CPHP. As part of this analysis, vehicle trips associated with the CPHP were assigned to specific routes they would likely take to and from the campus site during the weekday PM peak hour. Vehicle trips were assigned to roadways and intersection turning movements according to the trip distribution percentages identified in **Table 4.15-13** and based on local knowledge, historical traffic counts, and garage entry/exit counts conducted in October 2018. The CPHP trip assignment analysis was used to determine existing plus project trips by intersection turning movement, which are shown on **Figure 3**.

TABLE 2. EXISTING CONDITIONS (PARNASSUS HEIGHTS CAMPUS) AND CPHP (FUTURE PHASE) DAILY AND PEAK HOUR VEHICLE TRIPS

Population Group	Existing Conditions		CPHP (Future Phase)	
	Daily	PM Peak	Daily	PM Peak
Faculty/Staff/Students	6,400	1,100	10,600	1,900
Patient/Visitor	7,900	700	16,500	1,200
Residents	500	100	1,700	300
Total[1]	**14,900**	**1,900**	**28,800 (+95%)**	**3,400 (+75%)**

Notes:
1. Percentages presented in parentheses represent the percent change between existing conditions and full buildout of the CPHP.

Based on the 'Existing plus CPHP' analysis, the number of vehicles and delay, particularly on Parnassus Avenue will increase during the PM peak hour. For example, for the five study intersections on Judah Street-Parnassus Avenue between Fifth Avenue and Medical Center Way, total traffic volumes are expected to increase by approximately 50 percent between the 'Existing' and 'Existing plus CPHP' scenarios. As presented in **Table 3** below, five of these 17 study intersections are expected to operate at LOS F, which is traditionally considered unsatisfactory, under 'Existing plus CPHP' conditions:

- Kirkham Street/Seventh Avenue
- Judah Street-Parnassus Avenue/Fifth Avenue
- Parnassus Avenue/Fourth Avenue
- Parnassus Avenue/Third Avenue
- Parnassus Avenue/Hillway Avenue

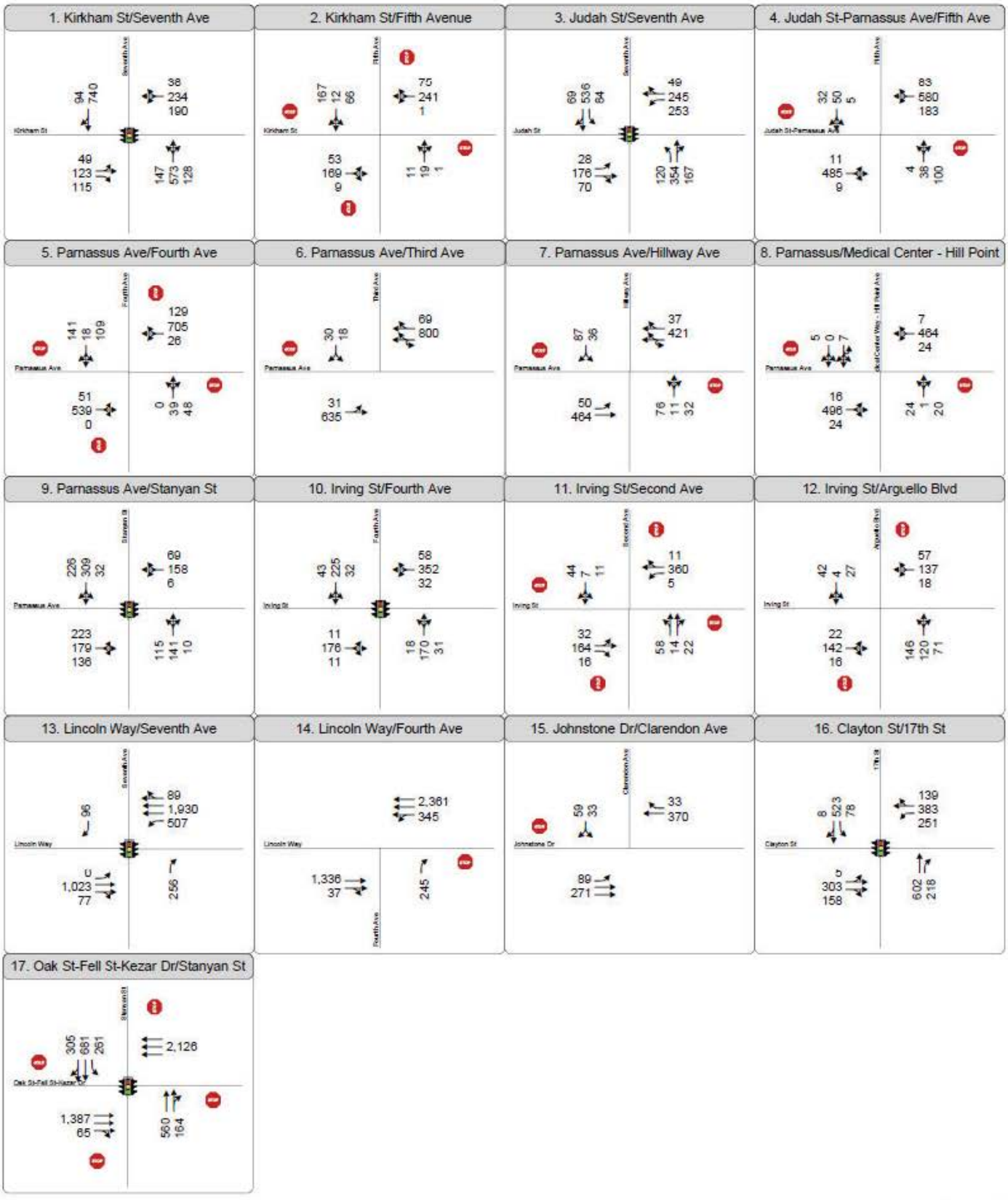


Figure 3

'Existing Plus CPHP' Peak Hour Turning Movement Volumes

TABLE 3
EXISTING PLUS CPHP PM PEAK HOUR INTERSECTION LEVEL OF SERVICE (LOS)

Intersection	Traffic Control[a]	Delay (seconds)[b]	LOS[c]
1. Kirkham Street / Seventh Avenue	Signal	>80	F
2. Kirkham Street / Fifth Avenue	AWS	11 (11, WB)	B (B, WB)
3. Judah Street / Seventh Avenue	Signal	34	C
4. Judah Street-Parnassus Avenue / Fifth Avenue	SSS	>50 (SB)	F (SB)
5. Parnassus Avenue / Fourth Avenue	AWS	>50 (>50, WB)	F (F, WB)
6. Parnassus Avenue / Third Avenue	SSS	>50 (SB)	F (SB)
7. Parnassus Avenue / Hillway Avenue	SSS	>50 (F)	F (NB)
8. Parnassus Avenue / Medical Center Way / Hill Point Avenue	SSS	25 (NB)	C (NB)
9. Parnassus Avenue / Stanyan Street	Signal	40	D
10. Irving Street / Fourth Avenue	Signal	19	B
11. Irving Street / Second Avenue	AWS	<10 (11, WB)	A (B, WB)
12. Irving Street / Arguello Boulevard	SSS	44 (NB)	E (NB)
13. Lincoln Way / Seventh Avenue	Signal	26	C
14. Lincoln Way / Fourth Avenue	SSS	26 (NB)	D (NB)
15. Johnstone Drive / Clarendon Avenue	SSS	14 (SB)	B (SB)
16. Clayton Street / 17th Street	Signal	49	D
17. Oak Street-Fell Street-Kezar Drive / Stanyan Street	Signal	47	D

a AWS = All-way stop controlled; SSS = Side Street stop controlled; Signal = Signal controlled
b Delay reported as seconds per vehicle. For signalized intersections, a combined weighted average delay for the various movements within the intersection is reported. For SSS intersections, the highest average delay for an approach is reported. For AWS intersections, the combined weighted average delay of the intersection is reported, followed by the highest average delay for an approach (indicated in parentheses).
c For signalized intersections, LOS based on average intersection delay, based on the methodology in the *Highway Capacity Manual*, 2000. For SSS intersections, LOS is based on the worst approach. For AWS intersections, LOS is based on average intersection delay, and the LOS based on the worst approach is presented in parentheses.

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Source: Fehr & Peers, 2020.

The intersections that are expected to operate at LOS F during the PM peak hour are largely in the western portion of Parnassus Avenue that runs through the campus between Third Avenue and Fifth Avenue. The future intersection of Parnassus Avenue-Hillway Avenue and the New Hospital loading loop, and the Seventh Avenue/Kirkham Street intersection just outside the campus site are also expected to operate at LOS F with implementation of the project.

Most of the intersections with other streets on Parnassus Avenue are side-street stop-controlled intersections; only the intersection of Fourth Avenue currently requires vehicles to stop while traveling on Parnassus Avenue itself. However, there are also two traffic signals at the pedestrian crosswalks on Parnassus Avenue across from the Millberry Union and Moffitt Hospital which require vehicles to occasionally stop when the crossing button is actuated by a waiting pedestrian on either side of the street. Although vehicles occasionally need to stop at these crosswalks, they are not treated as intersections for the purpose of this analysis, because there is not a side-street that connects into the street. Vehicle delay at the side-street stop-controlled intersections along Parnassus Avenue (at Fifth Avenue and Third Avenue) occurs primarily on the side-street intersection approaches, due to lack of gaps in major street traffic. While additional delay is likely to occur at these intersections with the CPHP, including on Parnassus Avenue itself, the magnitude of potential reduction in average vehicle travel speeds on Parnassus Avenue is not perfectly captured and conveyed by the intersection LOS results, which report side-street delay. In addition, given the challenge of finding gaps in Parnassus Avenue traffic in which they can proceed at these intersections, drivers may proactively avoid these approaches in an effort to reduce their delay. This would, in turn, affect vehicle delay estimates at these intersections as traffic shifts elsewhere.

At Parnassus Avenue/Fourth Avenue, vehicles are delayed by design at each of the stop-controlled approaches. This, however, has the effect of providing gaps in Parnassus Avenue traffic for drivers on Fourth Avenue approaches to proceed. With the design and implementation of the extension of Fourth Avenue, UCSF will further study the tradeoffs and feasibility of installing a traffic signal at this location. Installation of a traffic signal would require coordination with the SFMTA.

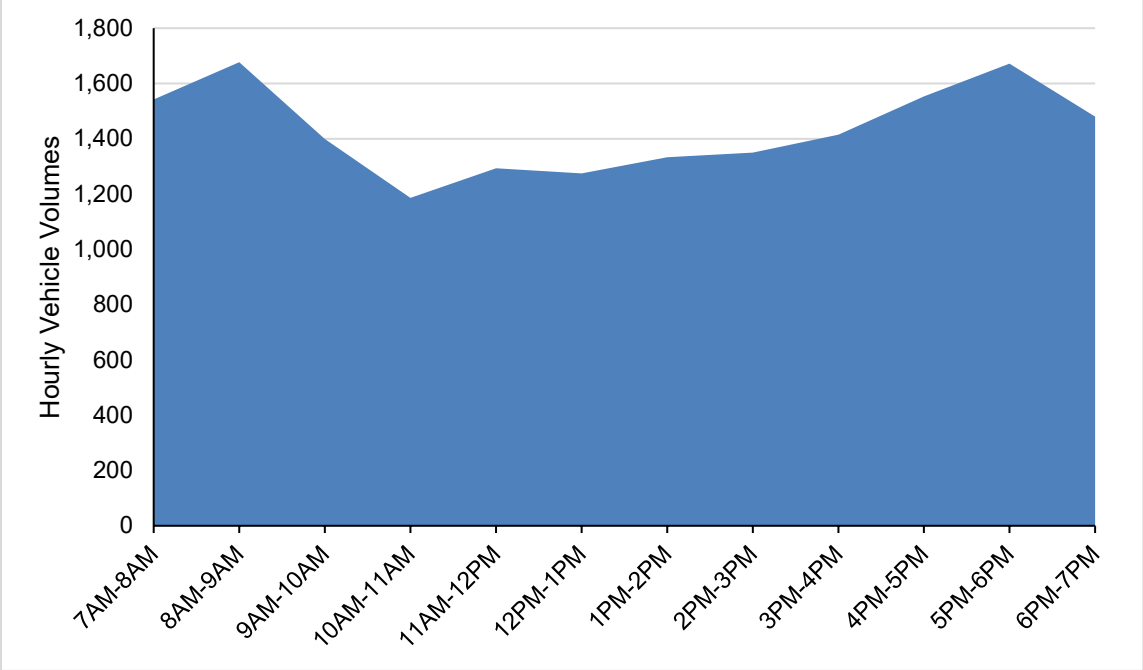
Side-street delay is also anticipated to increase at the future intersection of Parnassus Avenue-Hillway Avenue and the New Hospital loading loop, with the most delay expected for vehicles exiting the proposed hospital loading loop. With the design and future environmental study related to the New Hospital, UCSF will further study the tradeoffs and feasibility of installing a traffic signal at this location. Installation of a traffic signal would require coordination with the SFMTA.

Average delay is expected to increase at Seventh Avenue/Kirkham Street, specifically on the northbound and westbound approaches, where project-generated vehicle trips would be added during the PM peak.

Local Traffic Operations – Daytime Period (7:00 AM-7:00 PM)

The previous section, *Local Traffic Operations – Weekday PM Peak Period*, summarizes traffic conditions during the weekday PM peak period, and compares Existing and Existing plus CPHP conditions, using traffic volumes, vehicle delay, and LOS calculations. The traffic volumes analyzed above represent the most detailed forecast traffic volumes developed as part of this study. In contrast, this section draws upon intersection counts at two intersections on Parnassus Avenue and existing parking garage activity data (which serves as a reasonable proxy for demand for travel to/from the campus site), both over the course of the weekday between 7:00 AM and 7:00 PM.

Figure 4 presents the relative total hourly intersection turning movements for the two campus "gateway" intersections on Parnassus Avenue,[1] which represent both UCSF and non-UCSF-related travel and provide a general indication of vehicle activity on Parnassus Avenue throughout the day. **Figure 4** illustrates that volumes on Parnassus Avenue are greater during the AM and PM peak hours and relatively constant during the midday period between the two peak hour periods. During the 10:00 AM-3:00 PM period, total vehicle volumes on Parnassus Avenue are approximately 20 percent less compared to the PM peak hour.



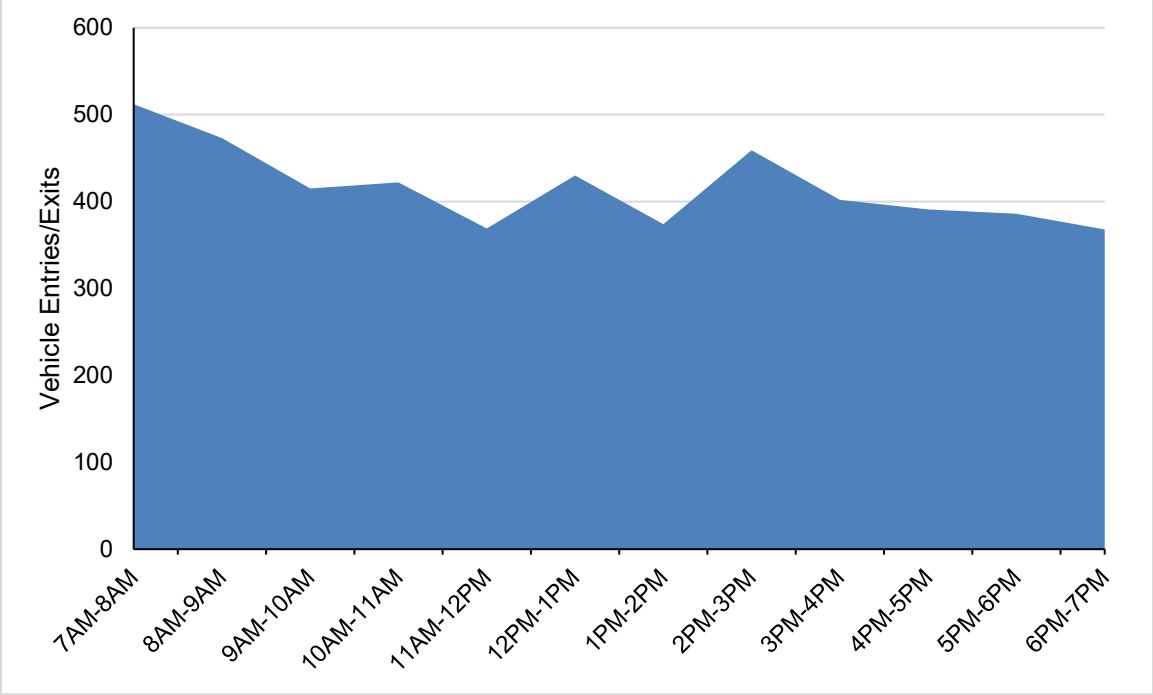
SOURCE: Fehr & Peers, 2020.

Figure 4
Existing Hourly Vehicle Volumes – Parnassus Avenue (Intersection Turning Movements)

[1] Data was collected at the Judah Street-Parnassus Avenue/Fifth Avenue and Parnassus Avenue/Medical Center Way/Hill Point Avenue intersections as part of the *UCSF LRDP Monitoring – Parnassus Gateway Counts Summary* in Fall 2018.

Vehicle volumes on Irving Street were not collected throughout the day; however, based on an understanding of general traffic patterns in the area, vehicle volumes on Irving Street are likely to follow a similar pattern as Parnassus Avenue, with more "peaking" (i.e., greater vehicle volumes during the AM and PM peak period compared to the midday period between the two peak periods).

While vehicle volumes on Parnassus Avenue are generally lower during the midday period compared to the AM and PM peak periods, the campus site generates steady demand for travel over the course of the weekday, as opposed to being concentrated during commute periods only. To this point, **Figure 5** below summarizes vehicle in/out data for the Medical Building 1 and Millberry Union garages, which shows that garage activity is relatively constant throughout the day. The greater concentration of activity between 7:00 AM-8:00 AM is mostly related to faculty/staff arrivals into the Medical Building 1 garage, and represents approximately 30 percent higher activity than during the PM peak hour period. Later in the day, between 9:00 AM-3:00 PM garage in/out activity is relatively constant, with a peak between 2:00 PM-3:00 PM, which represents approximately 20 percent higher activity than during the PM peak hour period. Garage in/out activity is then relatively constant from 3:00 PM until 7:00 PM.



SOURCE: Fehr & Peers, 2020

Figure 5
Medical Building 1 and Millberry Union Garages – Existing Hourly Vehicle Entries/Exits

In the future, with implementation of the CPHP, UCSF populations are expected to travel to/from the campus site during similar time periods as existing conditions. Therefore, while vehicle activity is expected to increase with implementation of the CPHP, increased vehicle activity would occur throughout the day with a similar pattern as existing conditions.

In terms of vehicle circulation and access, vehicles using Medical Building 1 garage, which mainly serves faculty and staff and valet services, access the garage using Irving Street. Vehicles using Millberry Union garage, which mainly serves patients and visitors, as well as some staff after 2:00 PM, can access the garage from both Irving Street and Parnassus Avenue. Approximately 70 percent of vehicles accessing the Millberry Union garage do so via Parnassus Avenue. In the future, with implementation of the CPHP, vehicles are expected to access the two garages similar to existing conditions since the garage access points and travel patterns to/from campus are expected to remain the same. In addition, a new proposed passenger loading facility in the Millberry Union garage is proposed in the CPHP and would be accessed via Parnassus Avenue and the existing garage ramps.

In summary, **Figure 5** illustrates that total vehicle volumes on Parnassus Avenue are greater during the AM and PM peak hours and approximately 20 percent lower during the 10:00 AM-3:00 PM period. However, UCSF-related vehicle activity is approximately 20 percent higher during that same period, compared to the PM peak hour (see **Figure 4**), and any increase in vehicle activity associated with the CPHP is expected to follow a similar pattern. This study does not include a quantitative analysis of the 'Existing plus CPHP' scenario throughout the day; the *Local Traffic Operations – Weekday PM Peak Period* section, analyzes the 'Existing plus CPHP' scenario during the PM peak hour only. However, using the discussion related to **Figure 4** and **Figure 5** as a proxy, the relationship between traffic conditions during the PM peak hour and throughout the rest of the day, is expected to be generally similar under both Existing and 'Existing plus CPHP' conditions.

Potential Effects of Traffic Operations on Multimodal Operations

The CPHP would result in more vehicles at the campus site throughout the day, traveling more slowly, as described in the "Existing Plus CPHP Conditions" and "Local Traffic Operations – Daytime Period" sections above. To the degree to which the CPHP is unable to accommodate vehicle trips in off-street parking and/or passenger loading facilities as described in the "Approach to Analysis" section of the Transportation Section, vehicle queues – or people circling for parking (on-street or in garages) – may periodically:

- Result in transit delay on Parnassus Avenue (6 Haight/Parnassus, 43 Masonic) and Irving Street (N Judah)

- Reduce accessibility by blocking multimodal transportation facilities, such as crosswalks, bicycle lanes, and/or transit stops

With implementation of the CPHP, the campus site would have both more locations and capacity for passenger loading to occur, than it presently does. Specifically, the location of new loading areas off Parnassus Avenue like the new extension of Fourth Avenue, the New Hospital loading loop, and the proposed passenger loading facility in the Millberry Union garage are described in *Section 4.15, Transportation* (see description of roadway network changes in "Impact TRANS-3" section). These locations present opportunities for vehicles to exit the travel lane in a designated location in order for passengers to enter and exit near their destinations. However, UCSF cannot

guarantee that drivers will follow the California Vehicle Code in a consistent manner, exiting the travel lane, and not blocking crosswalks, bicycle lanes, and delaying access to transit stops by transit vehicles when picking up and dropping off passengers. Further, although passenger loading supply for the campus site is expected to be greater than demand for most of the day, there may be peak passenger travel periods where demand, either for the campus site overall, or for specific locations is greater than supply. During these periods there would be a higher chance of delay to transit or a reduction in access to transportation facilities. See the "Loading Demand" section in *Section 4.15, Transportation* for descriptions of anticipated passenger loading demand and passenger loading supply with implementation of the CPHP.

Cumulative Conditions

Future year cumulative traffic volumes were developed in order to assess the long-term cumulative effects of the CPHP in combination with projected development within San Francisco and the rest of the Bay Area as well as expected implementation of planned transportation infrastructure and transit service projects. The CPHP would be implemented over a 30-year horizon, meaning it is expected to be complete around year 2050. For future year cumulative analyses, intersection traffic volumes are derived from outputs from the current version of the San Francisco County Transportation Authority's travel demand forecasting model (SF-CHAMP Model), which is used consistently for transportation planning studies in San Francisco. The current future year version of the model represents year 2040 conditions. The CPHP is expected to extend beyond this period, however there are no identified or reasonably foreseeable projects that would begin and conclude during the period between 2040 and 2050 that should be included in the analysis. SF-CHAMP's current future model year therefore represents an appropriate comparison for cumulative conditions.

SF-CHAMP divides San Francisco into 981 transportation analysis zones (TAZs). It also includes about 1,260 additional TAZs outside of San Francisco, for which it uses the same geography as the current Metropolitan Transportation Commission (MTC) travel demand forecasting model. Five TAZs in SF-CHAMP encompass the Parnassus Heights campus site and its immediately adjacent areas.[2]

For each TAZ, SF-CHAMP estimates the travel demand based on TAZ population and employment assumptions developed by the Association of Bay Area Governments (ABAG). Within San Francisco, the Planning Department is responsible for allocating ABAG's countywide growth forecast to each TAZ for the future cumulative year model, based upon existing zoning and approved plans, using an area's potential zoning capacity, and the anticipated extent of redevelopment of existing uses.

Regional travel demand models such as SF-CHAMP are designed to be able to represent city-wide and regional trends and do not directly provide intersection turning movement volumes. Instead, the SF-CHAMP model provides traffic volume growth between existing (in this case, 2015, which represents the most recently available "base year" travel model scenario) and future years that can then be added to existing turning movement volumes collected in the field in a

2 These include TAZs 226, 227, 545, 546 and 547.

process that involves engineering judgment, past experience, and knowledge of the transportation characteristics of the study area. The resulting cumulative turning movement volumes can then be used as input to traffic analysis software to evaluate future intersection and turning movement operations.

Cumulative traffic conditions peak hour turning movement volumes are shown on **Figure 6**. LOS results for cumulative conditions are presented in **Table 4** and show that six out of the 17 study intersections are expected to operate at LOS F, which is traditionally considered unsatisfactory, under cumulative conditions:

- Kirkham Street / Seventh Avenue
- Judah Street-Parnassus Avenue / Fifth Avenue
- Parnassus Avenue / Fourth Avenue
- Parnassus Avenue / Third Avenue
- Parnassus Avenue / Hillway Avenue
- Irving Street / Arguello Boulevard

Cumulative traffic conditions are similar to the 'Existing Plus CPHP,' which reflects that the CPHP would be implemented over a 30-year horizon, and that there are no other identified projects proposed in the vicinity of the study area. However, the results are not exactly the same as the cumulative condition reflects growth in travel in the city and region, beyond the immediate study area, whereas the 'Existing plus CPHP' conditions only account for growth in travel due to the CPHP.

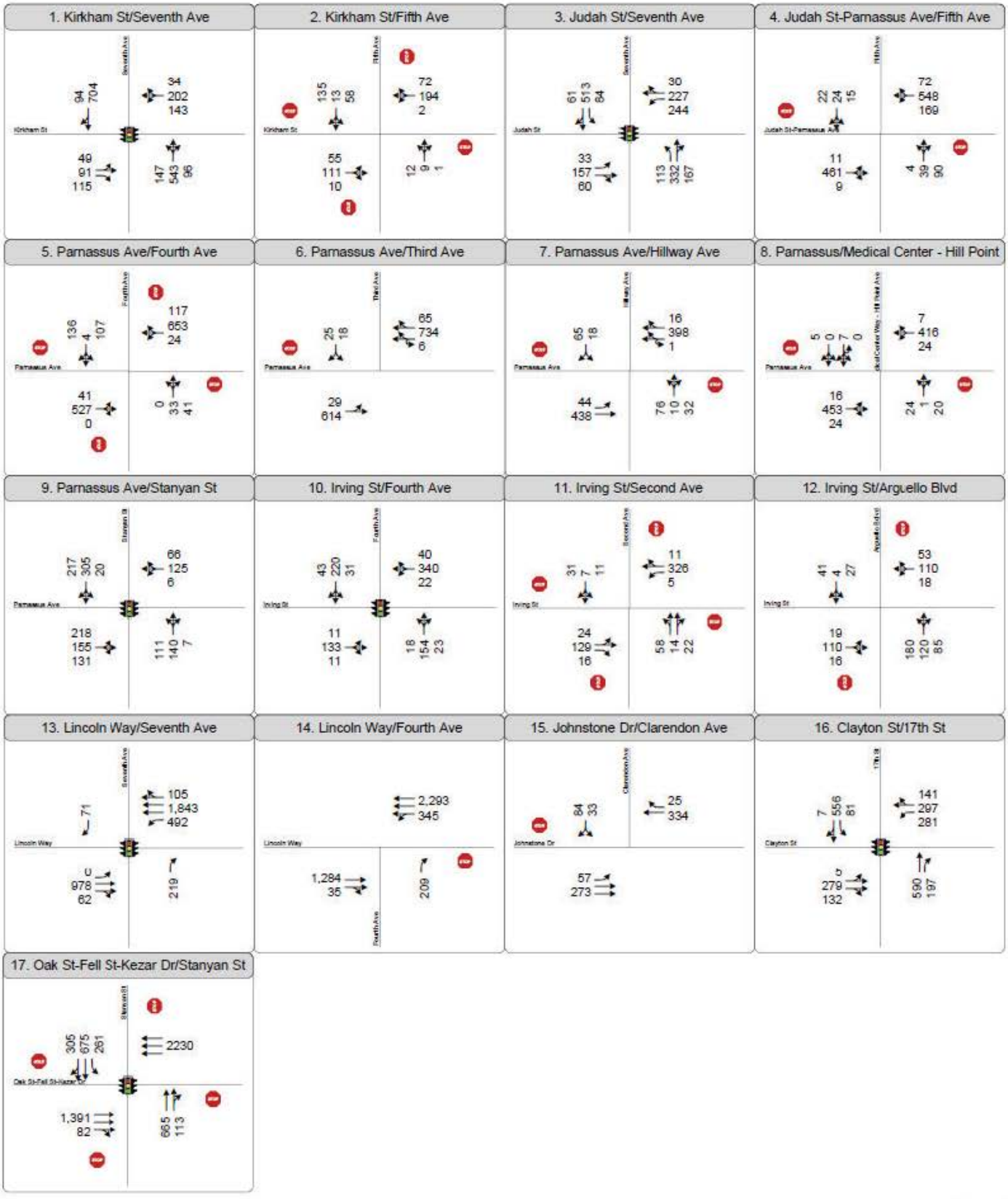


Figure 6

'Cumulative' Peak Hour
Turning Movement Volumes

TABLE 4
CUMULATIVE PM PEAK-HOUR INTERSECTION LEVEL OF SERVICE (LOS)

Intersection	Traffic Control[a]	Delay (seconds)[b]	LOS[c]
1. Kirkham Street / Seventh Avenue	Signal	>80	F
2. Kirkham Street / Fifth Avenue	AWS	13 (14, WB)	B (B, WB)
3. Judah Street / Seventh Avenue	Signal	43	D
4. Judah Street-Parnassus Avenue / Fifth Avenue	SSS	>50 (SB)	F (SB)
5. Parnassus Avenue / Fourth Avenue	AWS	>50 (>50, WB)	F (F, WB)
6. Parnassus Avenue / Third Avenue	SSS	44 (SB)	E (SB)
7. Parnassus Avenue / Hillway Avenue	SSS	>50 (>50, NB)	F (NB)
8. Parnassus Avenue / Medical Center Way / Hill Point Avenue	SSS	27 (NB)	D (NB)
9. Parnassus Avenue / Stanyan Street	Signal	62	E
10. Irving Street / Fourth Avenue	Signal	19	B
11. Irving Street / Second Avenue	AWS	12 (14, WB)	B (B, WB)
12. Irving Street / Arguello Boulevard	SSS	>50 (NB)	F (NB)
13. Lincoln Way / Seventh Avenue	Signal	29	C
14. Lincoln Way / Fourth Avenue	SSS	41 (NB)	E (NB)
15. Johnstone Drive / Clarendon Avenue	SSS	16 (SB)	C (SB)
16. Clayton Street / 17th Street	Signal	51	D
17. Oak Street-Fell Street-Kezar Drive / Stanyan Street	Signal	45	D

a AWS = All-way stop controlled; SSS = Side Street stop controlled; Signal = Signal controlled
b Delay reported as seconds per vehicle. For signalized intersections, a combined weighted average delay for the various movements within the intersection is reported. For SSS intersections, the highest average delay for an approach is reported. For AWS intersections, the combined weighted average delay of the intersection is reported, followed by the highest average delay for an approach (indicated in parentheses).
c For signalized intersections, LOS based on average intersection delay, based on the methodology in the *Highway Capacity Manual*, 2000. For SSS intersections, LOS is based on the worst approach. For AWS intersections, LOS is based on average intersection delay, and the LOS based on the worst approach is presented in parentheses.

Source: Fehr & Peers, 2020.

Appendix WSE
Water Supply Evaluation

FINAL REPORT

University of California San Francisco Comprehensive Parnassus Heights Plan Water Supply Evaluation

PREPARED FOR

University of California San Francisco

JUNE 2020

WEST YOST ASSOCIATES

Comprehensive Parnassus Heights Plan Water Supply Evaluation

Prepared for

University of California San Francisco

Project No. 712-60-20-06



June 11, 2020

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Appendix A. Updated SFPUC Water Supply Availability and Reliability Projections
Appendix B. Comprehensive Parnassus Heights Plan Land Use and Water Demand Summary Table

List of Acronyms and Abbreviations

AF	Acre-feet
BARDP	Bay Area Regional Desalination Project
BAWSCA	Bay Area Water Supply and Conservation Agency
BDPLs	Bay Division Pipelines
DWR	California Department of Water Resources
CEQA	California Environmental Quality Act
City	City of San Francisco
WSE Study	Water Supply Evaluation Study
Cordilleras MWC	Cordilleras Mutual Water Company
DSS Model	Demand Management Decision Support System Model
EIR	Environmental Impact Report
ETo	Evapotranspiration
FY	Fiscal Year
gpm	Gallons Per Minute
Groveland CSD	Groveland Community Services District
HTWTP	Harry Tracy Water Treatment Plant
ISG	Individual Supply Guarantees
MAWA	Maximum Applied Water Allowance
MG	Million gallons
mgd	Million gallons per day
MG/yr	Million gallons per year
MWELO	Model Water Efficient Landscape Ordinance
MID	Modesto Irrigation District
RWQCB	Regional Water Quality Control Board

R&D	Research & Development
SFPUC	San Francisco Public Utilities Commission
SB 221	Senate Bill 221
SB 610	Senate Bill 610
RWS	SFPUC Regional Water System
sf	Square feet
SWRCB	State Water Resources Control Board
SVWTP	Sunol Valley Water Treatment Plant
SMP	Surface Mining Permit
SGMA	Sustainable Groundwater Management Act
TID	Turlock Irrigation District
USEPA	U.S. Environmental Protection Agency
UWMP	Urban Water Management Plan
WSAP	Water Shortage Allocation Plan
WSCP	Water Shortage Contingency Plan
WSA	Water Supply Assessment
WSIP	Water System Improvement Program
WBSD	West Bay Sanitary District
West Yost	West Yost Associates

EXECUTIVE SUMMARY

The purpose of this Water Supply Evaluation (WSE) is to perform an evaluation of the availability and reliability of water supplies to serve existing facilities and future planned development that is proposed under the University of California San Francisco (UCSF) Comprehensive Parnassus Heights Plan (CPHP or Plan) at the Parnassus Heights campus site. This evaluation is based on existing UCSF water demands at the Parnassus Heights campus site, water use trends, projected water demands for the future planned development under the CPHP and available water supplies from the San Francisco Public Utilities Commission (SFPUC).

The CPHP would modify the UCSF 2014 Long Range Development Plan (LRDP) by providing a long-term development framework for the revitalization of the Parnassus Heights physical environment and is intended to ensure that a modernized Parnassus Heights campus enhances UCSF's status as an anchor institution in the City of San Francisco (City). This WSE was prepared in support of the CPHP.

Projected Water Demands

The existing Parnassus Heights campus site water demand is approximately 0.33 million gallons per day (mgd) (FY 2018/2019 data). The net increase in water demand for both the Initial Phase and Future Phase of the CPHP is projected to be 0.20 mgd. With this projected increase in water demand, the total future water demand for the Parnassus Heights campus site is projected to be approximately 0.53 mgd. This projected water demand conservatively does not take into consideration ongoing projects by UCSF to reduce water demands at the Parnassus Heights campus site. Over the past ten years, potable water demand at the Parnassus Heights campus site has decreased from a maximum of 0.56 mgd in FY 2010/11 to a minimum of 0.31 mgd in FY 2016/17 as a result of the UCSF Water Action Plan. With full implementation of the ongoing water conservation projects, UCSF staff estimate UCSF can reduce existing FY 2018/19 water demand by about 20 percent, not including the proposed project.

Water Supply Availability and Reliability

As discussed in this WSE, UCSF purchases all of its water supplies from the SFPUC. UCSF is an in-City Retail Customer of the SFPUC. According to the 2015 UWMP for the City and County of San Francisco, prepared by SFPUC (SFPUC 2015 UWMP), SFPUC does not anticipate any water supply shortage during Normal water years through 2040. However, SFPUC does expect water shortages for Single Dry and Multiple Dry water years through 2040. During Single Dry and Multiple Dry water years, SFPUC expects to meet the water supply shortfalls through implementation of its Water Shortage Contingency Plan, as described in the SFPUC 2015 UWMP.

The reliability of SFPUC's water supplies is impacted by the SFPUC's Water System Improvement Plan (WSIP) and the Water Shortage Allocation Plan (WSAP). The WSIP aims to meet customer water needs in non-drought and drought conditions through the completion of defined improvements to the Regional Water System (RWS) that improve seismic, delivery, water quality, and water supply reliability for the RWS. The WSAP outlines the reductions in water allocated to wholesale and retail customers that would occur if SFPUC declares a water shortage emergency.

As discussed in this WSE, greater shortfalls may be possible as a result of the 2018 amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) requiring additional water demand reductions in Dry Years.

With full implementation of the Bay-Delta Plan Amendment, water supplies for in-City retail customers could be curtailed by up to approximately 50 percent. Given that the Parnassus Heights includes a variety of medical uses, and the SFPUC General Manager has some discretion in allocating Dry Year demand reductions, the SFPUC rationing during periods of drought may not be as severe for Parnassus Heights as for other retail customers.

In 2019, SFPUC updated the water supply availability and reliability findings of the 2015 UWMP considering the potential impacts of the Bay-Delta Plan Amendment on future SFPUC supply availability and reliability projections. These potential impacts are discussed in Section 7 of this WSE (see Appendix A for SFPUC's updated water supply availability and reliability projections).

Based on the technical analyses described in this WSE and the SFPUC 2015 UWMP, as modified by updated SFPUC water supply availability and reliability projections, this WSE finds that the increase in potable water demands for the Parnassus Heights campus site upon implementation of the CPHP would not be so large as to affect the ability of the SFPUC to meet demand with existing and planned supplies during Normal, Single Dry, and Multiple Dry years through 2040, which is the farthest year of analysis included in the SFPUC 2015 UWMP.

1.0 INTRODUCTION

The UCSF 2014 LRDP outlines projected development levels and patterns for UCSF at all of its main campus sites through the year 2035. The 2014 LRDP Final EIR (FEIR) was certified by the Regents in November 2014 and includes, among other things, analysis of the potential environmental impacts from then-envisioned development at the Parnassus Heights campus site.

Since the adoption of the 2014 LRDP and certification of the 2014 LRDP FEIR, UCSF undertook a planning process to re-envision and revitalize the Parnassus Heights campus site as a whole, to integrate UCSF's clinical, educational, and research missions in ways that promote collaboration and synergies in the UCSF Parnassus Heights campus community. The planning process resulted in the development of the CPHP, which provides a long-term development framework for the revitalization of the Parnassus Heights physical environment. In addition, it is intended to ensure that a modernized Parnassus Heights enhances UCSF's status as an anchor institution in San Francisco. This WSE was prepared in support of the CPHP.

1.1 Legal Requirement for Completion of a Water Supply Assessment

California Senate Bill 610 (SB 610) amended state law, effective January 1, 2002, to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 sought to promote more collaborative planning between local water suppliers and cities and counties. The statute requires detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of specified large development projects. The purpose of this coordination is to ensure that prudent water supply planning has been conducted, and that planned water supplies are adequate to meet existing demands, anticipated demands from approved projects and tentative maps, and the demands of proposed projects.

SB 610 amended California Water Code sections 10910 through 10915 (inclusive) to require land use lead agencies to:

- Identify any public water purveyor that may supply water for a proposed development project; and
- Request a WSA from the identified water purveyor.

The purpose of a WSA is to demonstrate the sufficiency of the purveyor's water supplies to satisfy the water demands of the proposed development, while still meeting the water purveyor's existing and planned future uses. Water Code sections 10910 through 10915 delineate the specific information that must be included in the WSA.

Although the SB 610 requirements do not specifically apply to UCSF, because it is not a city or a county, UCSF has voluntarily elected to prepare a WSA-like document, a WSE, to determine and demonstrate the sufficiency of the SFPUC's water supplies to satisfy the water demand of the planned development at the Parnassus Heights campus site under the 2014 LRDP and CPHP.

The SFPUC prepared an UWMP for the City and County of San Francisco in 2015[1], which evaluated the projected water demands, including demands for UCSF, and available water supplies for the City and County.

1.2 Water Supply Evaluation Purpose, Format and Organization

The purpose of this WSE is to perform an evaluation of the availability and reliability of water supplies to serve development completed to date, future planned development under the UCSF 2014 LRDP, and the future planned development under the CPHP, based on existing UCSF water demands, water use trends, and available water supplies from the City.

Evaluation criteria and assumptions used for this WSE are consistent with those used by SFPUC in the 2015 UWMP. Furthermore, this WSE has been prepared and organized to parallel and be consistent with the requirements for a WSA per Water Code sections 10910 through 10915, such that this evaluation provides a comprehensive and up-to-date evaluation of the availability and reliability of water supplies to serve the planned development.

This WSE includes the following sections:

- Section 1: Introduction
- Section 2: Description of Proposed Project
- Section 3: Required Determinations
- Section 4: SFPUC Water System
- Section 5: SFPUC Water Demands
- Section 6: SFPUC Water Supplies
- Section 7: Water Supply Reliability
- Section 8: Determination of Water Supply Sufficiency Based on Requirements of SB 610
- Section 9: References

Relevant citations of Water Code sections 10910 through 10915 are included throughout this WSE in italics to demonstrate consistency with the specific requirements of SB 610.

The purpose of this WSE is not to reserve water, or to function as a "will serve" letter or any other form of commitment to supply water (see Water Code section 10914). The provision of water service will continue to be undertaken in a manner consistent with applicable City policies and procedures, consistent with existing law.

This WSE will be included as an appendix to the Draft EIR for the CPHP, and the conclusions reached in this document will be considered in analyzing the project's potential impacts on water supply.

[1] 2015 Urban Water Management Plan for the City and County of San Francisco, adopted by the SFPUC, June 2016.

2.0 DESCRIPTION OF THE PROPOSED PROJECT

On November 20, 2014, the Regents adopted the UCSF 2014 LRDP. The 2014 LRDP serves as a comprehensive physical land use plan and policy document to guide the physical development of the San Francisco campus at its various campus sites, accommodating future increases in enrollment and clinical, academic, and research activities, and increased housing demand at UCSF and meeting its projected educational and research demand. The 2014 LRDP serves as the planning document for development anticipated to occur by horizon year 2035. The 2014 LRDP contains objectives to guide decisions for future facilities to meet demands and projects the quantities and uses of new building space needed during this time frame.

Since the adoption of the 2014 LRDP and certification of the 2014 LRDP Final EIR, UCSF initiated a planning process to re-envision the Parnassus Heights campus as a whole, seeking ways to update and reorganize campus facilities to better respond to UCSF's clinical, educational, and research missions. This planning process resulted in a CPHP that provides a vision for the future of the campus site, ensuring that a modernized Parnassus Heights campus enhances UCSF's status as an anchor institution in San Francisco. Figure 2-1 shows the location of the proposed project.

Because the CPHP proposes to modify the Parnassus Heights development plan identified in the 2014 LRDP, an amendment of the 2014 LRDP is proposed. The proposed LRDP amendment would revise those portions of the 2014 LRDP pertaining to the Parnassus Heights campus site to incorporate concepts and proposals identified in the CPHP. Proposed changes would include revisions to functional zones; revisions to the space program, update to estimated population; revisions to existing planning agreements, including revisions to the Regents' Resolution and an update to the Greenhouse Gas Reduction Strategy.

If the Regents approve the proposed 2014 LRDP amendment to incorporate the CPHP, the CPHP would become the primary planning document for the Parnassus Heights campus site and would guide the development of the Parnassus Heights campus site for the next 30 years, or an approximate horizon year of 2050.



Symbology

Project Area

0 400 800

Scale in Feet

UCSF University of California San Francisco

WEST YOST ASSOCIATES

Figure 2-1

Parnassus Heights Campus Site Location

University of California San Francisco
Comprehensive Parnassus Heights Plan
Water Supply Evaluation

2.1 Objectives of the CPHP

In total, the CPHP provides for development of approximately 2.9 million gross square feet (gsf) of new building space at the Parnassus Heights campus site. The CPHP includes an "Initial Phase" that comprises: 1) Irving Street Arrival improvements, 2) Research and Academic Building (RAB), 3) New Hospital, and 4) initial Aldea Housing Densification, as well as other Initial Phase improvements. The Initial Phase would account for approximately 1.4 million gsf of new building development and is anticipated to be completed by approximately year 2030.

Beyond the Initial Phase, the Future Phase encompasses the remaining approximately 1.5 million gsf of new building development described in the CPHP envisioned for completion by the horizon year of 2050. The CPHP Future Phase comprises all remaining development opportunities identified under the CPHP. Potential development includes the following: 1) Millberry Union New Towers and Terrace, 2) hotel for patients and families, 3) new program adjacent to RAB, 4) West Side Housing, 5) childcare on Proctor Site, 6) future phase of Aldea Housing, 7) open space, 8) utilities and infrastructure, and 9) circulation, transportation, and parking.

The net increase in building space at the campus site under the CPHP would be approximately 2.0 million gsf, when accounting for demolition that was approved under the 2014 LRDP but yet not implemented, and potential additional building demolition that would occur under the CPHP.

2.2 Projected Water Demand

The UCSF campus has made substantial progress towards reducing its overall water consumption. UCSF implemented new technologies that contributed to this decrease such as the recycling of condensed steam, recycling excess filter water from laboratories, replacing or retrofitting old water equipment, and fixing leaks. Table 2-1 summarizes the decline of the Parnassus Heights campus site total water consumption from 2009 to 2019.

Table 2-1. Parnassus Heights Campus Site Total Water Consumption

Fiscal Year	Potable Water Use, gal	Potable Water Use, average mgd
2009-2010	197,546,800	0.54
2010-2011	204,395,488	0.56
2011-2012	187,829,532	0.51
2012-2013	171,047,404	0.47
2013-2014	154,981,860	0.42
2014-2015	136,492,048	0.37
2015-2016	121,867,900	0.33
2016-2017	114,034,096	0.31
2017-2018	121,779,636	0.33
2018-2019	121,967,384	0.33

Source: University of California San Francisco, Parnassus Water Data 2009/2010 to 2018/2019

The Parnassus Heights campus site water demands were estimated based on the projected land use from the CPHP. The projected water demand is summarized in Table 2-2. A comprehensive land use and projected water demand summary table is shown in Appendix B. The existing Parnassus Heights water demand is estimated to be 0.33 mgd (FY 2018/2019 data). The net increase in water demand for both the Initial Phase and Future Phase of the CPHP is projected to be 0.20 mgd. With this projected increase in total water demand, the future water demand for the Parnassus Heights campus site is projected to be approximately 0.53 mgd. This projected water demand does not take into consideration ongoing projects by UCSF to reduce water demands at the Parnassus Heights campus. With full implementation of the ongoing water conservation projects, UCSF staff estimate UCSF can reduce existing FY 2018/19 water demand by about 20 percent, not including the proposed project.

Table 2-2. Parnassus Heights Plan Projected Water Demand

Project	Net Change in Water Demand, mgd	Net Change in Water Demand, af/year
Initial Phase		
Irving Street Arrival Improvements	-	-
(Medical Building 1 modifications)		
Research and Academic Building (RAB)[a]	0	4.1
New Hospital	0.06	62.7
Initial Aldea Housing Densification[b]	0.01	14.3
Future Phase		
Millberry Union New Towers and Terrace[c]	0.01	12
Hotel for Patients and Families	0.01	10.8
New Program Adjacent to RAB[d]	0.04	50.1
West Side Housing	0.04	43.3
Child Care on Proctor Site[e]	0	2.7
Future Phase of Aldea Housing[f]	0.02	19.2
Small Daycare Center at Aldea	0	1.7
Open Space	-	-
Utilities and Infrastructure	-	-
Circulation, Transportation and Parking	-	-
Total Additional Demand for CPHP	0.2	220.9
Existing Parnassus Demand (2018)	0.33	363.2
Future Parnassus Demand	0.53	584

(a) The demolition of UC Hall is accounted for in the Net Change estimate for the proposed RAB project. The School of Nursing building would also be demolished; those uses would be continued in other buildings at the campus site.
(b) The demolition of three existing Aldea housing structures is accounted for in the Net Change estimate for the Initial Aldea Housing Densification.
(c) The demolition of the existing Millberry Union is accounted for in the Net Change estimate for the proposed Millberry Union New Towers and Terrace
(d) The demolition is Dental Clinics building is accounted for in the Net Change estimate for the proposed New Program Adjacent to RAB.
(e) The demolition of the existing Kirkham and Lucia Child Care Centers are accounted for in the Net Change estimate.
(f) The demolition of nine existing Aldea housing structures is accounted for in the Net Change estimate for the proposed Future Phase of Aldea Housing.

3.0 REQUIRED DETERMINATIONS

This section describes the required determinations for a WSA.

3.1 Does SB 610 apply to the Proposed Project?

Cities and counties are the only lead agencies specifically required by SB 610 to prepare a water supply assessment for certain projects. Although the SB 610 requirements do not specifically apply to UCSF because it is not a city or county, the University has voluntarily elected to prepare a WSA-like document to determine and demonstrate the sufficiency of the SFPUC's water supplies to satisfy the water demand of the planned development under the CPHP.

This WSE has been prepared to document the projected water demands for the UCSF Parnassus Heights campus site to be developed under the CPHP and to demonstrate that adequate water supplies are available to meet the projected UCSF water demands. For completeness and clarity, this WSE has been prepared to be consistent with the requirements of SB 610 for a WSA, although SB 610 does not apply to campus development under the CPHP.

3.2 Who is the Identified Public Water System?

> *10910(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined by Section 10912, that may supply water for the project*
>
> *10912 (c) "Public water system" means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections…*

The UCSF Parnassus Heights campus site is located within the City and County of San Francisco within the SFPUC water service area; therefore, the SFPUC is the public water system for the proposed project.

3.3 Does the City have an adopted Urban Water Management Plan (UWMP) and does the UWMP include the projected water demand for the Proposed Project?

> *10910(c)(1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).*

The SPFUC 2015 UWMP does not specifically identify existing and projected water demands for UCSF. The potable water demand projections included in the SFPUC 2015 UWMP are summarized in Table 3-1.

Table 3-1. Potable Water Demands Included in the SFPUC 2015 UWMP[a,b]

	Actual	Projected				
	2015	2020	2025	2030	2035	2040
Total Retail Demand, mgd	70.1	77.5	79.0	82.3	85.9	89.9

(a) Total Retail 2015 actual demands from the SFPUC 2015 UWMP, Table 4-1.

(b) Includes both In-City and Suburban Retail demands. Groveland Community Services District (Groveland CSD) is accounted for as a retail customer for the purpose of this table and subsequent retail supply and demand comparisons. Demand projections were provided by Groveland CSD based on its population projections and assumed per capita water use of 130 GPCD (projections are subject to change as part of its UWMP process).

As described below, the existing water demands for the UCSF Parnassus Heights campus site are estimated to be approximately 0.33 mgd and would increase by 0.20 mgd with buildout of the CPHP for a total future demand of 0.53 mgd, not accounting for additional water conservation measures anticipated by UCSF. The projected water demand at buildout of the CPHP (0.53 mgd) is approximately 0.6 percent of the SFPUC projected total 2040 Retail potable water demand. If the incremental demand (0.20 mgd) due to the CPHP is compared to the SFPUC 2040 total retail demand, it would represent an even smaller fraction (about 0.2 percent). If the 20 percent reduction in existing use can be achieved, the net increase in demand would be 0.13 mgd, which would represent about 0.14 percent of the total retail demand in 2040.

4.0 SFPUC WATER SYSTEM

Refer to Section 3.1 of the SFPUC 2015 UWMP for descriptions of the RWS and Section 6.1 of the SFPUC 2015 UWMP for water rights held by City and County of San Francisco and the SFPUC WSIP.

5.0 SFPUC WATER DEMANDS

10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).

The descriptions provided below for the SFPUC's retail water demands have been taken, for the most part, from the SFPUC 2015 UWMP.

5.1 Historical and Existing Water Demand

Water use within San Francisco (i.e., the in-City retail service area) continues to be among the lowest in the State and below historical consumption. Both total consumption and per capita water use (i.e., gallons of water consumed per person per day [GPCD]) have been on a general decline since the mid-1970s. Many factors have contributed to this reduction in water use, including significant changes to the mix of industrial and commercial businesses and their associated water demand, and the general characteristics of water use by San Franciscans. As shown in Figure 5-1, annual gross retail water use has declined since 2001, in spite of increasing population.

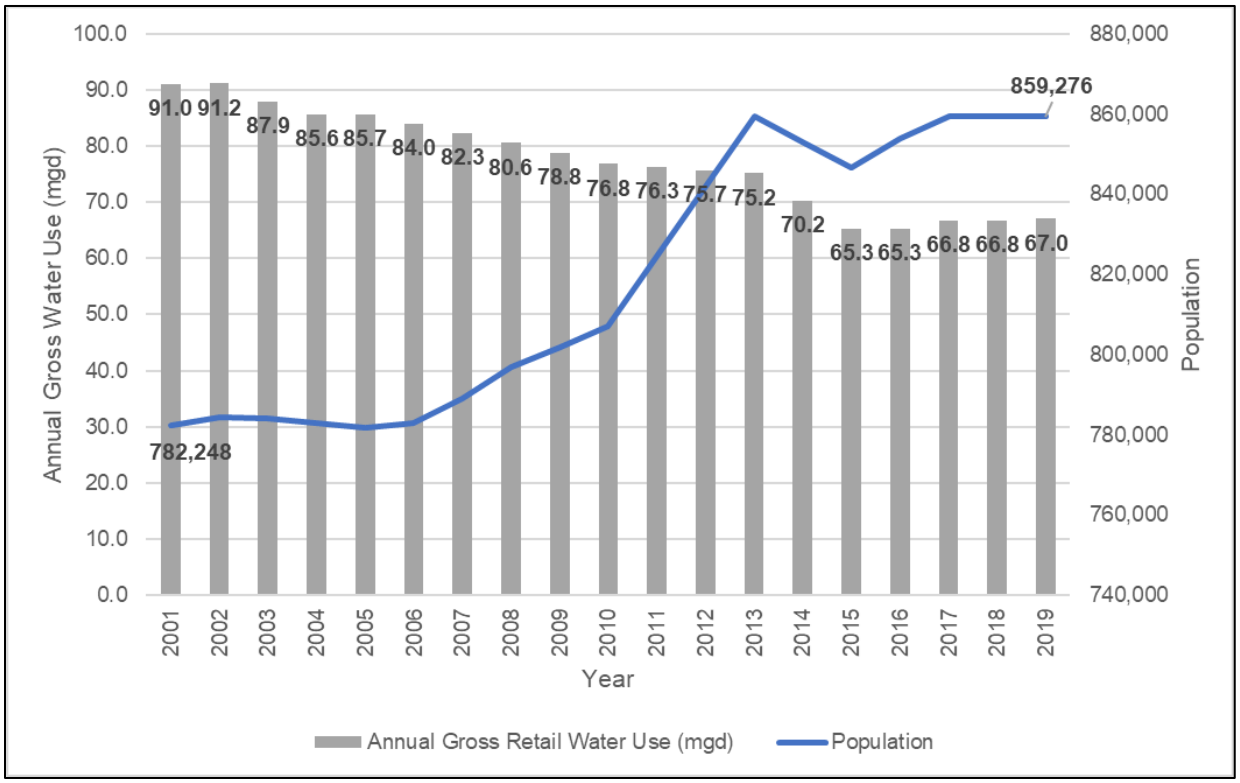

Figure 5-1. Trends in In-City Retail Water Use Since 2001[2]

[2] Data for 2001 through 2010 from SFPUC 2015 UWMP Tables 5-1 and 5-2. Data for 2013 and 2015 through 2019 from California State Water Resources Control Board Urban Water Supplier Monitoring Reports, downloaded May 28, 2020. Data for 2011, 2012, and 2014 interpolated from adjacent data.

5.2 Future Water Demand

In the 2015 UWMP, the SFPUC utilized end-use methodology to forecast both demands and conservation savings. The model was updated over the years to incorporate the latest growth forecasts, extend the projection period, reflect changes to the SFPUC's conservation programming, incorporate the latest codes and ordinances, and to respond to a variety of other needs. It relies on household and employment forecasts provided by the San Francisco Planning Department's Land Use Allocation (LUA) 2012.

Table 5-1 provides a summary of SFPUC's future water demand projections for its various water use types. The table segregates water demands into three sectors of water use: single family residential, multi-family residential, and non-residential, and shows both in-City retail and suburban retail water demands.

Table 5-1. Projected Retail Water Demands, mgd

Retail Sector or Use Type	Actual[a]	Projected[b]				
	2015	2020	2025	2030	2035	2040
In-City Retail						
Single Family Residential	14.5	15.5	16.3	17.8	19.5	21.1
Multi-Family Residential	22.2	22.1	22.8	24	25	26.2
Non-residential	23.6	28.9	28.9	29.5	30.4	31.6
Water Loss[c]	5.3	6	6	6	6	6
Subtotal In-City Retail Demand	65.6	72.5	74	77.3	80.9	84. **9**
Suburban Retail						
Single Family Residential[d]	0.1	0.1	0.1	0.1	0.1	0.1
Non-residential	4.1	4.4	4.4	4.4	4.4	4.4
Groveland CSD[e]	0.3	0.5	0.5	0.5	0.5	0.5
Water Loss[c]	0	0	0	0	0	0
Subtotal Suburban Retail Demand	4.5	5	5	5	5	5
Total Retail Demand	70.1	77.5	79	82.3	85.9	89.9

Source: SFPUC 2015 UWMP; Table 4-1

(a) Actual consumption data are obtained from customer billing data.
(b) Projected single family residential, multi-family residential, and non-residential demands are obtained from the SFPUC Water Conservation Tracking Model and reflect both passive and active conservation
(c) Water losses include both apparent and real losses. Suburban retail water losses are considered to be negligible. Estimate of actual water loss in 2015 is based on a draft audit under review as of the publication of the 2015 UWMP.
(d) Suburban retail residential demands are for single family only as no multi-family residential buildings are served.
(e) Groveland CSD is accounted for as a retail customer for the purpose of this table and subsequent retail supply and demand comparisons. Demand projections were provided by Groveland CSD based on its population projections and assumed per capita water use of 130 GPCD (projections are subject to change as part of its UWMP process).

6.0 SFPUC MUNICIPAL WATER SUPPLIES

10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f) and (g).

10910(d)(1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system…under the existing water supply entitlements, water rights, or water service contracts.

10910(e) If no water has been received in prior years by the public water system…under the existing water supply entitlements, water rights, or water service contracts, the public water system…shall also include in its water supply assessment…an identification of the other public water systems or water service contract holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system.

10910(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment.

(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.

(2) A description of any groundwater basin or basins from which the proposed project will be supplied. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most recent bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical use records.

(5) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project. A water assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by paragraph (4) of subdivision (b) of Section 10631.

The descriptions provided below for SFPUC's water supplies have been taken, for the most part, from SFPUC's 2015 UWMP.

6.1 Water Supply Overview

Over 2.6 million people in San Francisco and throughout the Bay Area rely on water supplied by the SFPUC to meet their daily water needs. The RWS is a municipal-owned utility operated by the SFPUC, a department of the City and County of San Francisco, and serves both retail and wholesale customers. The RWS supplies high-quality drinking water from the Tuolumne River watershed and from local reservoirs in the Alameda and Peninsula watersheds. The RWS draws an average of 85 percent of its supply from the Tuolumne River watershed, collected in Hetch Hetchy Reservoir in Yosemite National Park. This water feeds into an aqueduct system delivering water 167 miles by gravity to Bay Area reservoirs and customers. The remaining 15 percent of the RWS supply is drawn from local surface waters in the Alameda and Peninsula watersheds. The split between these resources varies from year to year depending on the water year hydrology and operational circumstances. Separate from the RWS, the in-City distribution system is also owned and operated by the SFPUC and serves a population of nearly 850,000 in San Francisco. In-City retail customers are primarily served with RWS supply, but a few customers also receive groundwater and recycled water. Similarly, suburban retail customers are primarily served with RWS supply, but a few customers receive groundwater.

Complete descriptions of the RWS and local water supplies are provided in the SFPUC 2015 UWMP as follows:

- Retail water supplies from the RWS are described in Section 6.1 of the SFPUC 2015 UWMP
- Local groundwater supplies, including the Westside Groundwater Basin, are described in Section 6.2.1 of the SFPUC 2015 UWMP
- Local recycled water supplies, including the Harding Park Recycled Water Project and Pacifica Recycled Water Project, are described in Section 6.2.1 of the SFPUC 2015 UWMP

6.2 Future Local Supplies

The San Francisco Groundwater Supply Project is described in Section 6.2.2 of the SFPUC 2015 UWMP. Since adoption of the SFPUC 2015 UWMP, four wells have been completed and the start-up phase of the project has begun. Starting in April 2017, small amounts of groundwater have been blended with RWS supplies for drinking water. Two remaining wells are under construction as part of the next phase of the project.

The proposed Westside and Eastside Recycled Water Projects, as well as non-potable water supplies associated with onsite water systems implemented in compliance with San Francisco's Non-potable Water Ordinance (Health Code Chapter 12C), are also described in Section 6.2.2 of the SFPUC 2015 UWMP.

6.3 Summary of Existing and Additional Planned Future Water Supplies

Table 6-1 shows the existing and projected retail water supply documented in the SFPUC 2015 UWMP.

Table 6-1. Existing and Projected Retail Water Supply, mgd

Retail Sector or Use Type	Actual	Projected[b]				
	2015	2020	2025	2030	2035	2040
Regional Water System[a]	67.7	70.5	71.9	73.2	76.7	80.6
Groundwater						
San Francisco Groundwater Supply Project[b]	—	4	4	4	4	4
Westside Groundwater Basin for In-City Irrigation[b]	1.5	0.3	0.3	0.3	0.3	0.3
Castlewood Well System[c]	0.3	0.4	0.4	0.4	0.4	0.4
Sunol Filter Gallery[d]	0.4	0.3	0.3	0.3	0.3	0.3
Subtotal Groundwater	2.2	5	5	5	5	5
Recycled Water						
Westside Recycled Water Project	—	1.6	1.6	1.6	1.6	1.6
Eastside Recycled Water Project	—	—	—	2	2	2
Harding Park Recycled Water Project[e]	0.2	0.2	0.2	0.2	0.2	0.2
Pacifica Recycled Water Project[f]	0	0.1	0.1	0.1	0.1	0.1
Subtotal Recycled Water[g]	0.2	1.9	1.9	3.9	3.9	3.9
Non-potable Water[h]	0	0.1	0.2	0.2	0.3	0.4
Total Retail Supply	70.1	77.5	79	82.3	85.9	89.9

Source: SFPUC 2015 UWMP; Table 6-7

(a) Assuming that the retail supply allocation of 81 mgd per the 2009 WSAP between SFPUC and its Wholesale Customers is extended to 2040, up to 81 mgd of RWS supply may be used.

(b) About 1.5 mgd of groundwater currently serves irrigation at Golden Gate Park, the San Francisco Zoo, and the Great Highway medians. A reserve of 0.3 mgd for irrigation purposes will remain as part of the non-potable groundwater supply, while 1.2 mgd will be converted to potable supply under the San Francisco Groundwater Supply Project.

(c) Castlewood CSA is served by the Castlewood Well System.

(d) Irrigation uses in Sunol (currently the Sunol Valley Golf Club) are served by subsurface diversions from the Sunol Filter Gallery.

(e) Irrigation at Harding Park and Fleming Golf Courses is provided recycled water from NSMCSD.

(f) Irrigation at Sharp Park Golf Course is provided recycled water from NCCWD. Approximately 0.01 mgd was provided in 2015 after deliveries began in October 2014.

(g) A small amount of recycled water is dispensed from the Southeast Water Pollution Control Plant recycled water truck-fill station for various approved uses, but the annual volume is not considered large enough to be reported in the 2015 UWMP (about 739,000 gallons, or 0.002 mgd, in 2015).

(h) Non-potable water includes onsite water reuse as mandated by the Non-Potable Water Ordinance.

7.0 WATER SUPPLY RELIABILITY

> *10910(c)(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during Normal, Single Dry, and Multiple Dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.*
>
> *10911(a) If, as a result of its assessment, the public water system concludes that its water supplies are, or will be, insufficient, the public water system shall provide to the city or county its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. If the city or county, if either is required to comply with this part pursuant to subdivision (b), concludes as a result of its assessment, that water supplies are, or will be, insufficient, the city or county shall include in its water supply assessment its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies. Those plans may include, but are not limited to, information concerning all of the following:*
>
> *(1) The estimated total costs, and the proposed method of financing the costs, associated with acquiring the additional water supplies.*
>
> *(2) All federal, state, and local permits, approvals, or entitlements that are anticipated to be required in order to acquire and develop the additional water supplies.*
>
> *Based on the consideration set forth in paragraphs (1) and (2), the estimated timeframes within which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), expects to able to acquire additional water supplies.*

The reliability discussion provided below has been taken, for the most part, from the SFPUC 2015 UWMP and recent updates to SFPUC's water supply availability and reliability projections.

The SFPUC 2015 UWMP describes the reliability of the SFPUC water supply. Reliability of the RWS is expressed in terms of the system's ability to deliver water during droughts. Reliability may be quantified by the amount and frequency of water delivery reductions (i.e., deficiencies) required to balance customer demands with available supplies. The SFPUC plans deliveries under the premise that a drought more severe than the worst drought on record may occur. Potential system-wide and retail deficiencies are described in this section.

The total amount of water the SFPUC can deliver to retail and wholesale customers depends on several factors, including the amount of water that is available to the SFPUC from natural runoff, the amount of water in reservoir storage, and the amount of that water that must be released from the RWS for purposes other than customer deliveries (e.g., required instream flow releases below RWS reservoirs). For planning purposes, the SFPUC "normal year" is based on historical hydrology under conditions that allow the reservoirs to be filled over the course of the snowmelt season, allowing full deliveries to customers.

In the 1987-92, a shortfall developed between the SFPUC's supplies and its customers' demands such that significant rationing of water supply became necessary. Other than during the drought of 1976-77, drought sequences in the past did not seriously affect the ability of the RWS to sustain full deliveries to its retail and wholesale customers. Following the 1987-92 drought experience, the SFPUC includes the concept of its "firm" capability in water supply planning, which is defined as the amount of water the RWS can be expected to deliver during drought periods. The following sections describe the SFPUC water supply reliability and potential impacts to that reliability:

- Water System Improvement Program
- Dry-year Water Supply Projects
- Projected SFPUC RWS Supply Reliability
- Potential Changes in SFPUC RWS Reliability

7.1 Water System Improvement Program

SFPUC's Water System Improvement Program (WSIP) was approved on October 31, 2008, with the purpose of improving the delivery reliability of the RWS. The initial objectives of the WSIP related to water supply were to:

- Meet average annual water demand of 265 mgd from the SFPUC watersheds for retail and wholesale customers during non-drought years for system demands through 2018
- Meet dry-year delivery needs through 2018 while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts
- Diversify water supply options during non-drought and drought periods
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers

The WSIP provides benefits to retail customers by improving the reliability of wholesale water purchased from SFPUC, especially during period of drought. The program aims to meet customer water needs in non-drought and drought conditions and provides dry-year water supply projects to augment all year type water supplies during drought. The WSIP includes both local projects (located within San Francisco) and regional projects (spread over seven different counties from the Sierra foothills to San Francisco). As of March 31, 2020, 34 of the 35 local projects have been completed, with one project is in construction closeout[3], and regional projects are 98.6 percent complete[4]. The current forecasted date to complete the overall WSIP (including regional and local projects) is May 2023.

7.2 Dry-Year Water Supply Projects

Approximately 85 percent of the SFPUC supply is sourced from the Tuolumne River watershed (through Hetch Hetchy Reservoir) and the remaining 15 percent comes from local watersheds, which include the Alameda Creek watershed and San Mateo County watersheds. Water supply from the local watersheds is stored in the following reservoirs: San Antonio, Calaveras, Crystal Springs, Pilarcitos, and San Andreas. These water supplies are used for all year types, and SFPUC has historically met demand in its service area in all year types.

[3] SFPUC WSIP Local Projects Quarterly Report (Q3/FY19-20) dated May 19, 2020.

[4] SFPUC WSIP Regional Projects Quarterly Report (Q3/FY19-20) dated May 19, 2020.

During dry years, the WSIP limits systemwide rationing to a maximum of 20 percent in any one year. The following projects are a part of the WSIP and will help meet water demand during dry years, as well as will help to improve the seismic, delivery, water quality, and water supply reliability for the RWS:

- Calaveras Dam Replacement Project
- Alameda Creek Recapture Project
- Lower Crystal Springs Dam Improvements
- Regional Groundwater Storage and Recovery Project
- Dry-Year Water Transfer

In order to achieve its target of meeting at least 80 percent of its customer demand during droughts at 265 mgd, the SFPUC must successfully implement the Dry-Year water supply projects included in the WSIP and described in detail in the following sections.

Furthermore, the permitting obligations for the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements include a combined commitment of 12.8 mgd for instream flows on average. When this is reduced for an assumed Alameda Creek Recapture Project recovery of 9.3 mgd, the net loss of water supply is 3.5 mgd. The SFPUC's participation in regional water supply reliability efforts, such as the Bay Area Regional Desalination Project (BARDP), additional water transfers, and other projects may help to make up for this shortfall.

7.2.1 Calaveras Dam Replacement Project

Calaveras Dam is located near a seismically active fault zone and was determined to be seismically vulnerable. To address this vulnerability, the SFPUC constructed a new dam of equal height downstream of the existing dam. The Environmental Impact Report was certified by the San Francisco City Planning Commission in 2011, construction of the new dam was completed in September 2018, and the overall project was completed in June 2019.

7.2.2 Alameda Creek Recapture Project

The Alameda Creek Recapture Project will recapture the water system yield lost due to instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Water that naturally infiltrates from Alameda Creek will be recaptured into an existing quarry pond known as SMP (Surface Mining Permit) -24 Pond F2. The project will be designed to allow the recaptured water to be pumped to the Sunol Valley Water Treatment Plant or to San Antonio Reservoir.

The San Francisco Planning Department published the Draft EIR for the project in November 2016, and the San Francisco Planning Commission certified the Final EIR in June 2017. However, in response to an appeal on the certification action, additional analysis was required and sections of the Draft EIR were recirculated for public review and comment in late 2019. Certification of the revised Final EIR occurred on April 28, 2020 and construction of the project is anticipated to take approximately 20 months with completion in 2022.

7.2.3 Lower Crystal Springs Dam Improvements

The Lower Crystal Springs Dam Improvements were substantially completed in November 2011. While the project has been completed, permitting issues for reservoir operation have become significant. While the reservoir elevation was lowered due to Division of Safety of Dams restrictions, the habitat for the Fountain Thistle, an endangered plant, followed the lowered reservoir elevation. Raising the reservoir elevation now requires that new plant populations be restored incrementally before the reservoir elevation is raised. The result is that it may be several years before the original reservoir elevation can be restored.

7.2.4 Regional Groundwater Storage and Recovery Project

The Groundwater Storage and Recovery Project is a strategic partnership between SFPUC and three San Mateo County agencies: the California Water Service Company (serving South San Francisco and Colma), the City of Daly City, and the City of San Bruno. The project seeks to balance the management of groundwater and surface water resources in a way that safeguards supplies during times of drought. During years of normal or heavy rainfall, the project would provide additional surface water to the partner agencies in San Mateo County, allowing them to reduce the amount of groundwater that they pump from the South Westside Groundwater Basin. Over time, the reduced pumping would allow the aquifer to recharge and result in increased groundwater storage of up to 20 billion gallons. In dry years, when less surface water is available, the saved water will be pumped from up to 16 new groundwater well recovery facilities. Construction is expected to be completed in 2021.

7.2.5 Dry-Year Water Transfer

In 2012, a Dry-Year transfer was proposed between the Modesto Irrigation District and the SFPUC. Negotiations were terminated because an agreement could not be reached. Subsequently, the SFPUC is having ongoing discussions with the Oakdale Irrigation District for a one-year transfer agreement with the SFPUC for 2 mgd (2,240 AF).

7.3 Projected SFPUC RWS Supply Reliability

Procedures to allocate RWS supplies during SFPUC system shortages are specified in agreements between SFPUC and the Wholesale Customers. Water shortage allocation procedures and projected supplies during Normal and Dry Years are described below.

The wholesale customers and SFPUC adopted the Amended and Restated Water Supply Agreement in 2019, which included a Water Shortage Allocation Plan (WSAP) to allocate water from the RWS to retail and wholesale customers during system-wide shortages of 20 percent or less. The WSAP has two tiers which are described below.

- The Tier One Plan allocates water between SFPUC and the wholesale customers collectively based on the level of the shortage (up to 20 percent). This plan applies only when SFPUC determines that a system-wide water shortage exists and issues a declaration of a water shortage emergency under California Water Code Section 350. The SFPUC may also opt to request voluntary cutbacks from retail customers and the wholesale customers to achieve necessary water use reductions during drought periods. The allocations outlined in the Tier One Plan are provided in Table 7-1.

Table 7-1. Tier One Plan Water Shortage Allocations		
System-Wide Reduction Required	Share of Available Water	
	SFPUC	Wholesale Customers
≤ 5%	35.5%	64.5%
6% to 10%	36.0%	64.0%
11% to 15%	37.0%	63.0%
16% to 20%	37.5%	62.5%

- The Tier Two Plan allocates the collective wholesale customer share among the wholesale customers based on a formula that accounts for each wholesale customer's Individual Supply Guarantee (ISG), seasonal use of all available water supplies, and residential per capita use. The water made available to the wholesale customers collectively will be allocated among them in proportion to each wholesale customer's Allocation Basis, which is the weighted average of the wholesale customer's ISG and the Base/Seasonal Component. The Allocation Basis is used as the numerator over the sum of all wholesale customers' Allocation Bases to calculate each wholesale customer's Allocation Factor. The final shortage allocation for each wholesale customer is determined by multiplying the amount of water available to the wholesale customers collectively over the Tier One Plan by the wholesale customer's Allocation Factor. BAWSCA calculates each wholesale customer's Allocation Factors annually in preparation for a potential water shortage emergency.

For water shortages greater than 20 percent, the SFPUC will meet with the wholesale customers to determine if modifications to the Tier 1 Plan can be agreed upon by the SFPUC and its wholesale customers. If an agreement cannot be reached, SFPUC may allocate water at its discretion, subject to challenge by the wholesale customers, unless all of the wholesale customers direct that a particular Tier 2 allocation methodology be used.

7.4 Potential Changes in SFPUC RWS Reliability

In December 2018, the SWRCB adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan Amendment) to establish water quality objectives to maintain the health of the Bay-Delta ecosystem. The SWRCB is required by law to regularly review this plan. The adopted Bay-Delta Plan Amendment was developed with the stated goal of increasing salmonid populations in three San Joaquin River tributaries (the Stanislaus, Merced, and Tuolumne Rivers) and the Bay-Delta. The Bay-Delta Plan Amendment requires the release of 40 percent of the "unimpaired flow" on the three tributaries from February through June in every year type, whether wet, normal, dry, or critically dry.

The SFPUC 2015 UWMP already assumes shortages in Single and Multiple Dry Years through 2040, but implementation of the Bay-Delta Plan Amendment would result in greater shortages.

The SWRCB has stated that it intends to implement the Bay-Delta Plan Amendment on the Tuolumne River by the year 2022, assuming all required approvals are obtained by that time. But implementation of the Plan Amendment is uncertain for several reasons.

- First, under the Clean Water Act, the USEPA must approve the water quality standards identified in the Plan Amendment within 90 days from the date the approval request is received. By letter dated June 11, 2019, USEPA rejected the SWRCB's two-page submittal as inadequate under the requirements of the Clean Water Act. Pursuant to USEPA's letter, the Board has 90 days to respond with a submittal that complies with the law. At this point, USEPA has neither approved, nor disapproved, any of the revised water quality objectives. It is uncertain whether the USEPA will approve or disapprove the water quality standards in the future. Furthermore, the determination could result in litigation.
- Second, since adoption of the Bay-Delta Plan Amendment, over a dozen lawsuits have been filed in both state and federal court, challenging the SWRCB's adoption of the Bay-Delta Plan Amendment, including two legal challenges filed by the federal government, at the request of the U.S. Department of Interior, Bureau of Reclamation in state and federal courts. These cases are in the early stage and there have been no dispositive court rulings to date.
- Third, the Bay-Delta Plan Amendment is not self-implementing and does not allocate responsibility for meeting its new flow requirements to the SFPUC or any other water rights holders. Rather, the Plan Amendment merely provides a regulatory framework for flow allocation, which must be accomplished by other regulatory and/or adjudicatory proceedings, such as a comprehensive water rights adjudication or, in the case of the Tuolumne River, the 401 certification process in the Federal Energy Regulatory Commission's relicensing proceeding for Don Pedro Dam. The license amendment process is currently expected to be completed in the 2022-23 timeframe. This process and the other regulatory and/or adjudicatory proceedings would likely face legal challenges and have lengthy timelines, and quite possibly could result in a different assignment of flow responsibility (and therefore a different water supply impact on the SFPUC).
- Fourth, in recognition of the obstacles to implementation of the Bay-Delta Plan Amendment, SWRCB Resolution No. 2018-0059 adopting the Bay-Delta Plan Amendment directed staff to help complete a "Delta watershed-wide agreement, including potential flow measures for the Tuolumne River" by March 1, 2019, and to incorporate such agreements as an "alternative" for a future amendment to the Bay-Delta Plan to be presented to the SWRCB "as early as possible after December 1, 2019." In accordance with the SWRCB's instruction, on March 1, 2019, SFPUC, in partnership with other key stakeholders, submitted a proposed project description for the Tuolumne River that could be the basis for a voluntary substitute agreement with the SWRCB ("March 1st Proposed Voluntary Agreement"). On March 26, 2019, the SFPUC adopted Resolution No. 19-0057 to support SFPUC's participation in the Voluntary Agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency, California Environmental Protection Agency and the leadership of the Newsom administration. The negotiations for a voluntary agreement have made significant progress since an initial framework was presented to the SWRCB on December 12, 2018. The package submitted on March 1, 2019 is the product of renewed discussions since Governor Newsom took office. While significant work remains, the package represents an important step forward in bringing together diverse California water interests.

- As discussed above and in other recently prepared SFPUC WSAs, implementation of the plan amendment is uncertain for several reasons. Whether the Bay Delta Plan Amendment will be implemented, when it will be implemented, and the form that implementation will take, as well as how the amendment will affect SFPUC's water supply, are currently unknown. Given the uncertainty, the SFPUC has estimated total shortfalls in water supply through 2040 under three increasingly supply-limited scenarios:
  - Scenario 1: Without implementation of the Bay-Delta Plan Amendment, wherein the water supply and demand assumptions contained in the SFPUC 2015 UWMP, would remain applicable
  - Scenario 2: With implementation of a voluntary agreement between the SFPUC and the SWRCB, including a combination of flow and non-flow measures that would be designed to benefit fisheries at a lower water cost, particularly during Multiple Dry Years, than that under the Bay-Delta Plan Amendment
  - Scenario 3: With implementation of the Bay-Delta Plan Amendment as adopted

The SFPUC has estimated that water supply shortfalls during Dry Years would be lowest without implementation of the Bay-Delta Plan Amendment and highest with implementation of the Bay-Delta Plan Amendment. The range of shortfalls under the proposed voluntary agreement would be between those with and without implementation of the Bay-Delta Plan Amendment.

Under all three scenarios, the SFPUC would have adequate water to meet total retail demands through 2040 in normal years. For Single Dry Years and Multiple Dry Years of an extended drought, the SFPUC estimates that shortfalls in water supplies relative to retail demand would occur both with and without implementation of the Bay-Delta Plan Amendment. Without implementation of the Bay-Delta Plan Amendment, there would be a 5 percent shortfall in Single Dry Years or the first year of a multiple year drought. Shortfalls in subsequent years of multiple year droughts (years 2 through 8) would range from 6.2 percent to 6.8 percent. With implementation of the Bay-Delta Plan Amendment, shortfalls of up to 23.4 percent would occur in Single Dry Years and up to 49.8 percent in Multiple Dry Years.

The projected SFPUC water supply reliability under Scenarios 1 and 3 are shown in Appendix A and are taken from information included in a 2019 WSA prepared for another project located in San Francisco. No water supply reliability projections were produced for Scenario 2 because the details of the voluntary agreement had not been completed at that time of that 2019 WSA.

On February 4, 2020 the Newsom administration proposed a new framework for voluntary agreements[5]. The new framework would likely be less severe than full implementation of the Bay-Delta Plan Amendment; however, as of May 2020, it is not known if the SFPUC has prepared an evaluation of the potential impacts of the new voluntary agreement framework to its wholesale and retail customers.

[5] California Natural Resources Agency website (https://resources.ca.gov/Initiatives/Voluntary-Agreements). Accessed April 1, 2020.

8.0 DETERMINATION OF WATER SUPPLY SUFFICIENCY BASED ON THE REQUIREMENTS OF SB 610

> *10910(c)(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during Normal, Single Dry, and Multiple Dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.*
>
> *10911 (a) If, as a result of its assessment, the public water system concludes that its water supplies are, or will be, insufficient, the public water system shall provide to the city or county its plans for acquiring additional water supplies, setting forth the measures that are being undertaken to acquire and develop those water supplies.*

Pursuant to Water Code section 10910(c)(4) and based on the technical analyses described in this WSE, and the SFPUC 2015 UWMP, as modified by updated SFPUC water supply availability and reliability projections, this WSE finds that the increase in potable water demands for the Parnassus Heights campus site upon implementation of the CPHP would not be so large as to affect the ability of the SFPUC to meet demand with existing and planned supplies during Normal, Single Dry, and Multiple Dry years through 2040, which is the farthest year of analysis included in the SFPUC 2015 UWMP.

As discussed in this WSE, SFPUC is aggressively implementing projects to improve the reliability of the RWS to meet the water demands of its customers through 2040.

Table 8-1 summarizes the projected availability of SFPUC's existing and planned future water supplies and SFPUC's projected water demands in Normal, Single Dry, and Multiple Dry years through 2040 based on the SFPUC's recently updated water supply availability and reliability projections. As shown in Table 8-1, water demand within the SFPUC in-City service area is not expected to exceed the SFPUC water supply during Normal water years. However, water demand is expected to exceed the reduced SFPUC water supply during Single Dry and Multiple Dry water years, which results in the supply deficits shown in Table 8-1. SFPUC expects to meet these supply shortfalls through water demand reductions met by implementation of its Water Shortage Contingency Plan.

As discussed above in Section 7.4, greater shortfalls may be possible as a result of the Bay-Delta Plan Amendment requiring additional water demand reductions in Dry Years. However, whether and when the Bay-Delta Plan Amendment will be implemented, and how those amendments if implemented will affect the SFPUC's water supply is currently uncertain and possibly speculative. Furthermore, the SFPUC may allocate different levels of rationing to individual retail customers based on customer type to achieve the required level of retail system-wide rationing. The SFPUC may also impose a lower level of rationing that takes into account the installation of water-efficient plumbing fixtures and non-potable water systems associated with new construction.

Table 8-1. SFPUC Summary of Retail Water Demand Versus Supply During Hydrologic Normal, Single Dry, and Multiple Dry Years[a]

Hydrologic Condition		Supply and Demand Comparison, mgd				
		2020	2025	2030	2035	2040
Normal Year						
Available Water Supply[b]		72	79	82	86	90
Total Water Demand[c]		72	79	82	86	89.9
Potential Surplus (Deficit)		0	0	0	0	0
Percent Shortfall of Demand		—	—	—	—	—
Single Dry Year						
Available Water Supply		69	75	78	82	85.4
Total Water Demand		72	79	82	86	90
Potential Surplus (Deficit)		(3.6)	(4.0)	(4.1)	(4.3)	(4.5)
Percent Shortfall of Demand		5.0%	5.1%	5.0%	5.0%	5.0%
Multiple Dry Years						
Multiple Dry Year 1[d]	Available Water Supply	69	75	78	82	85.4
	Total Water Demand	72	79	82	86	90
	Potential Surplus (Deficit)	(3.6)	(4.0)	(4.1)	(4.3)	(4.5)
	Percent Shortfall of Demand	5.0%	5.1%	5.0%	5.0%	5.0%
Multiple Dry Year[e]	Available Water Supply	69	75	78	82	85.4
	Total Water Demand	72	79	82	86	90
	Potential Surplus (Deficit)	(3.6)	(4.0)	(4.1)	(4.3)	(4.5)
	Percent Shortfall of Demand	5.0%	5.1%	5.0%	5.0%	5.0%
Multiple Dry Year 3[e]	Available Water Supply	69	75	78	82	85.4
	Total Water Demand	72	79	82	86	90
	Potential Surplus (Deficit)	(3.6)	(4.0)	(4.1)	(4.3)	(4.5)
	Percent Shortfall of Demand	5.0%	5.1%	5.0%	5.0%	5.0%

(a) From Table 4, Projected Supply and Demand Comparison Under Scenario 1 (No Implementation of the Bay-Delta Plan Amendment or the Voluntary Agreement) of the 655 4th Street Project Water Supply Assessment (see Appendix A).

(b) Total retail demands correspond to those in Table 4-1 of the 2015 UWMP, except for the 2020 demand projection, which was re-projected to take into account the lower demands being experienced due to the recent drought and the lag in occupancy of built units.

(c) Local supplies (i.e., supplies not from the RWS, including groundwater, recycled water, and non-potable water) correspond to those in Table 6-7 of the 2015 UWMP, with an additional 5% reduction in retail water use (incorporated as a reduction in total retail supply) per the amended Water Supply Agreement. Local supplies are assumed to be used before RWS supplies to meet retail demand.

(d) During a single dry year and multiple dry year 1 (year 2 of SFPUC's design drought sequence), the retail allocation under the WSAP is 36.0% of available RWS supply, or 85.9 mgd. However, due to the Phased WSIP Variant, only 81 mgd of RWS supply can be delivered. RWS supply is capped at this amount.

(e) During multiple dry years 2-6 (years 3-7 of SFPUC's design drought sequence), the retail allocation under the WSAP is 37.5% of available RWS supply, or 79.5 mgd.

9.0 REFERENCES

San Francisco Public Utilities Commission. 2015 Urban Water Management Plan for the City and County of San Francisco. April 2016.

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APPENDIX A

Updated SFPUC Water Supply Availability and Reliability Projections

Table 4: Projected Supply and Demand Comparison Under Scenario 1
(No Implementation of the Bay-Delta Plan Amendment or the Voluntary Agreement) (mgd)

		Normal Year	Single Dry Year[1]	Multiple Dry Years							
				Year 1[1]	Year 2[2]	Year 3[2]	Year 4[2]	Year 5[2]	Year 6[2]	Year 7[3]	Year 8[3]
2020	Total Retail Demand[4]	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1
	Total Retail Supply[5]	72.1	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5
	Shortfall	0.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
	Shortfall as % of Demand	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
2025	Total Retail Demand[4]	79.0	79.0	79.0	79.0	79.0	79.0	79.0	79.0	79.0	79.0
	Total Retail Supply[5]	79.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
	Shortfall	0.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
	Shortfall as % of Demand	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
2030	Total Retail Demand[4]	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3
	Total Retail Supply[5]	82.3	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2	78.2
	Shortfall	0.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
	Shortfall as % of Demand	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
2035	Total Retail Demand[4]	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9
	Total Retail Supply[5]	85.9	81.6	81.6	81.6	81.6	81.6	81.6	81.6	79.5	79.5
	Shortfall	0.0	4.3	4.3	4.3	4.3	4.3	4.3	4.3	6.4	6.4
	Shortfall as % of Demand	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	7.4%	7.4%
2040	Total Retail Demand[4]	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9
	Total Retail Supply[5]	89.9	85.4	85.4	84.4	84.4	84.4	84.4	84.4	83.8	83.8
	Shortfall	0.0	4.5	4.5	5.5	5.5	5.5	5.5	5.5	6.1	6.1
	Shortfall as % of Demand	0.0%	5.0%	5.0%	6.2%	6.2%	6.2%	6.2%	6.2%	6.8%	6.8%

Notes:
1. During a single dry year and multiple dry year 1 (year 2 of SFPUC's design drought sequence), the retail allocation under the WSAP is 36.0% of available RWS supply, or 85.9 mgd. However, due to the Phased WSIP Variant, only 81 mgd of RWS supply can be delivered. RWS supply is capped at this amount.
2. During multiple dry years 2-6 (years 3-7 of SFPUC's design drought sequence), the retail allocation under the WSAP is 37.5% of available RWS supply, or 79.5 mgd.
3. During multiple dry years 7 and 8 (years 8 and 8.5 of SFPUC's design drought sequence), the retail allocation under the WSAP is 37.5% of available RWS supply, or 74.5 mgd.
4. Total retail demands correspond to those in ***Table 4-1 of the UWMP***, except for the 2020 demand projection, which was re-projected to take into account the lower demands being experienced due to the recent drought and the lag in occupancy of built units.
5. Local supplies (i.e., supplies not from the RWS, including groundwater, recycled water, and non-potable water) correspond to those in ***Table 6-7 of the UWMP***, with an additional 5% reduction in retail water use (incorporated as a reduction in total retail supply) per the amended Water Supply Agreement. Local supplies are assumed to be used before RWS supplies to meet retail demand.

Table 5: Projected Supply and Demand Comparison Under Scenario 3 (Implementation of the Bay-Delta Plan Amendment) (mgd)

		Normal Year	Single Dry Year[1]	Multiple Dry Years							
				Year 1[1]	Year 2[2]	Year 3[2]	Year 4[2]	Year 5[2]	Year 6[2]	Year 7[3]	Year 8[3]
2020	Total Retail Demand[4]	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1	72.1
	Total Retail Supply[5]	72.1	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5	68.5
	Shortfall	0.0	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
	Shortfall as % of Demand	0.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
2025	Total Retail Demand[4]	79.0	79.0	79.0	79.0	79.0	79.0	79.0	79.0	79.0	79.0
	Total Retail Supply[5]	79.0	66.7	66.7	52.8	52.8	52.8	52.8	52.8	42.9	42.9
	Shortfall	0.0	12.3	12.3	26.2	26.2	26.2	26.2	26.2	36.1	36.1
	Shortfall as % of Demand	0.0%	15.6%	15.6%	33.2%	33.2%	33.2%	33.2%	33.2%	45.7%	45.7%
2030	Total Retail Demand[4]	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3	82.3
	Total Retail Supply[5]	82.3	68.7	68.7	54.8	54.8	54.8	54.8	54.8	44.9	44.9
	Shortfall	0.0	13.6	13.6	27.5	27.5	27.5	27.5	27.5	37.4	37.4
	Shortfall as % of Demand	0.0%	16.5%	16.5%	33.4%	33.4%	33.4%	33.4%	33.4%	45.4%	45.4%
2035	Total Retail Demand[4]	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9
	Total Retail Supply[5]	85.9	68.8	68.8	54.9	54.9	54.9	54.9	54.9	45.0	45.0
	Shortfall	0.0	17.1	17.1	31.0	31.0	31.0	31.0	31.0	40.9	40.9
	Shortfall as % of Demand	0.0%	19.9%	19.9%	36.1%	36.1%	36.1%	36.1%	36.1%	47.6%	47.6%
2040	Total Retail Demand[4]	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9
	Total Retail Supply[5]	89.9	68.9	68.9	55.0	55.0	55.0	55.0	55.0	45.1	45.1
	Shortfall	0.0	21.0	21.0	34.9	34.9	34.9	34.9	34.9	44.8	44.8
	Shortfall as % of Demand	0.0%	23.4%	23.4%	38.8%	38.8%	38.8%	38.8%	38.8%	49.8%	49.8%

Notes:
1. During a single dry year and multiple dry year 1 (year 2 of SFPUC's design drought sequence), the retail allocation under the WSAP is 37.5% of available RWS supply, or 59.6 mgd.
2. During multiple dry years 2-6 (years 3-7 of SFPUC's design drought sequence), the retail allocation under the WSAP is 37.5% of available RWS supply, or 45.7 mgd.
3. During multiple dry years 7 and 8 (years 8 and 8.5 of SFPUC's design drought sequence), the retail allocation under the WSAP is 37.5% of available RWS supply, or 35.8 mgd.
4. Total retail demands correspond to those in ***Table 4-1 of the UWMP***, except for the 2020 demand projection, which was re-projected to take into account the lower demands being experienced due to the recent drought and the lag in occupancy of built units.
5. Local supplies (i.e., supplies not from the RWS, including groundwater, recycled water, and non-potable water) correspond to those in ***Table 6-7 of the UWMP***. Local supplies are assumed to be used before RWS supplies to meet retail demand.

APPENDIX B

Comprehensive Parnassus Heights Plan
Land Use and Water Demand Summary Table

Appendix B. Comprehensive Parnassus Heights Plan Land Use and Water Demand Summary Table

Project	Existing Area, gsf	Area to be Demolished , gsf	Area to be Added, gsf	Net Change in Area, gsf	Net Change[a]	Units	Unit Water Demand	Units for unit water demand	Net Change in Water Demand, gpy	Net Change in Water Demand, af/year	Net Change in Water Demand, CCF/year	Net Change in Water Demand, MGD
Initial Phase												
Irving Street Arrival Improvements (Medical Building 1 modifications)	-	30,000	45,000	15,000	NA	Gross Square Feet	-	NA	-	-	-	-
Research and Academic Building (RAB)[b]	-	233,000	270,000	37,000	37,000	Gross Square Feet	0.10	gpd/gsf [c]	1,350,500	4.1	1,805	3,700.0
New Hospital	-	-	955,000	955,000	200	Beds	280	gpy/APD [d]	20,440,000	62.7	27,326	56,000.0
Initial Aldea Housing Densification	-	24,000	177,000	153,000	142	Dwelling Units	90	gpd/Dwelling unit [e]	4,664,700	14.3	6,236	12,780.0
Future Phase												
Millberry Union New Towers and Terrace	-	153,000	260,000	107,000	107,000	Gross Square Feet	0.10	gpd/gsf [c]	3,905,500	12.0	5,221	10,700.0
Hotel for Patients and Families	-	-	48,000	48,000	64	Rooms	150	gpd/room [f]	3,504,000	10.8	4,684	9,600.0
New Program Adjacent to RAB	-	135,000	582,000	447,000	447,000	Gross Square Feet	0.10	gpd/gsf [c]	16,315,500	50.1	21,812	44,700.0
West Side Housing	-	-	281,000	281,000	430	Dwelling Units	90	gpd/Dwelling unit [e]	14,125,500	43.3	18,884	38,700.0
Child Care on Proctor Site[g]	-	11,000	35,000	24,000	24,000	Gross Square Feet	0.10	gpd/gsf [c]	876,000	2.7	1,171	2,400.0
Future Phase of Aldea Housing	-	102,000	327,000	225,000	190	Dwelling Units	90	gpd/Dwelling unit [e]	6,241,500	19.2	8,344	17,100.0
Small Daycare Center at Aldea	-	-	15,000	15,000	15,000	Gross Square Feet	0.10	gpd/gsf [c]	547,500	1.7	732	1,500.0
Open Space	-	-		-			-	NA	-	-	-	-
Utilities and Infrastructure	-	-		-			-	NA	-	-	-	-
Circulation, Transportation and Parking	-	-		-			-	NA	-	-	-	-
Total Additional Demand for CPHP									71,970,700	220.9	96,218	197,180.0
Existing Parnassus Demand (2018)									118,335,096	363.2	158,202	324,205.7
Future Parnassus Demand									190,305,796	584.0	254,420	521,385.7

(a) From draft Project Description.
(b) The demolition of UC hall is accounted for in the Net Change estimate.
(c) Based on average water demand for Parnassus FY 2017/2018 (118,335,096 gallons per year/365/3,266,900 gsf).
(d) Based on water demand per Adjusted Patient Day for UC San Francisco FY 2018/2019.
(e) Based on Aldea housing water demand for 2019.
(f) Assumes three persons per room and 50 gpd/person.
(g) The demolition of the existing Kirkham and Lucia Child Care Centers are accounted for in the Net Change estimate.

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Memo to the planning commission

HEARING DATE: January 7, 2021

Record No.:	2020-002347CWP
Project:	UCSF Comprehensive Parnassus Heights Plan (CPHP): MOU between City and UCSF
Staff Contacts:	Joshua Switzky – (628)652-7464, Land Use & Community Planning Program Manager joshua.switzky@sfgov.org Sheila Nickolopoulos– (628)652-7442, Senior Planner sheila.nickolopoulos@sfgov.org

Recommendation: None - Informational

Executive Summary

The University of California San Francisco (UCSF) will be seeking approval from the UC Regents on January 20-21, 2021 of the proposed Comprehensive Parnassus Heights Plan (CPHP). The CPHP is a 30-year plan to reinvest in and substantially grow the Parnassus Heights campus, including a new hospital, additional research space, new campus housing, improved public spaces and circulation, and other changes. Approval of the CPHP would require the Regents to amend its "space ceiling" for non-residential development that it imposed on the Parnassus campus and that has largely capped growth there since 1976. UCSF presented the CPHP to the Planning Commission at an informational hearing on June 4, 2020. As a state institution, UCSF is generally not subject to the jurisdiction of the City in its development activities. In response to the urging of Mayor London Breed and Supervisors Norman Yee and Dean Preston, the Planning Department, along with staff from other agencies, engaged UCSF and the public over the past several months in a process to craft a Memorandum of Understanding (MOU) between the City and UCSF to address City and community concerns regarding implementation of the CPHP. In addition to the multi-year public process conducted by UCSF in formulating the CPHP, the MOU-specific process, hosted by the Planning Department, and including representatives of the mayor's office, SFMTA, OEWD, SFDPH and others, has included two community workshops to date (with a third to be held on January 6, 2021) and other direct outreach and discussions with community members and the Supervisors. The draft MOU, presented here as an informational item to the Planning Commission, is the result of this process and contains commitments by UCSF to make additional investments in housing, transportation, workforce development, health care services, and ongoing coordination with the City, among other items. Following certification of the CPHP FEIR by the Regents later in January, the MOU would be executed by the City and UCSF.

Background

The University of California San Francisco (UCSF) is one of 10 campuses in the UC system, and the only one solely focused on health sciences. UCSF functions include teaching, research, and a health system with a hospital that consistently ranks in the top ten nationwide. UCSF is San Francisco's second largest employer – after the City itself – with 22,500 faculty and staff per the UCSF 2014 Long Range Development Plan (LRDP). UCSF has a student population of over 6,000 comprised entirely of graduate level students and beyond (e.g. postdocs, clinical residents). There are three major campus sites at Parnassus Heights, Mount Zion, and Mission Bay, and a multitude of other owned and leased sites throughout San Francisco, including at Zuckerberg San Francisco General Hospital. All told, UCSF occupies approximately 8 million square feet of building space across approximately 200 acres. UCSF currently provides approximately 1,600 units of housing for students, clinical residents, and faculty, located at Parnassus and the Mission Bay area (with the vast majority located at Mission Bay and vicinity).

The most significant change in physical facilities for UCSF citywide over the past twenty years have occurred at Mission Bay where UCSF has constructed a new campus, which was the major thrust of the university's 1996 LRDP. The most recent LRDP, adopted in 2014, focused on further intensification of its Mission Bay campus and other modest changes and reinvestment systemwide. One the most notable most change to UCSF's facilities considered, and now implemented, in the 2014 LRDP was the decommissioning and sale its 10.3-acre Laurel Heights facility at 3333 California, which was approved in 2019 by the Planning Commission and Board of Supervisors to be redeveloped with housing. Another was UCSF's acquisition and development of three sites in the Dogpatch area off the Mission Bay campus. Related to these projects in Dogpatch included engagement with the neighbors and the City, including the Planning Department and others, in a "cushioning action plan" whereby UCSF agreed to contribute toward or under-take improvements in that neighborhood of mutual benefit to UCSF and the neighborhood, including investments in open space, transportation, and community facilities. Planning for changes and construction at Mount Zion and Parnassus Heights has been much less substantial over the recent decades.

Parnassus Heights

Over the last two years, UCSF has been engaged in efforts to identify how best to reinvest in the Parnassus Heights campus, which is the oldest and largest of UCSF's campuses, to address a range of challenges facing this campus, including the viability of aging buildings, limitations of its facilities to meet the challenges of the contemporary healthcare and research environment, building code/seismic requirements for inpatient and clinical facilities, a goal of providing more housing for its students and workforce, and a desire to improve its public spaces and connectivity to the surrounding city.

The campus comprises 107 acres. UCSF's facilities are concentrated on the north side of the campus site, where Moffitt and Long Hospitals, four professional schools, clinics, research, housing, parking, and other support uses are located. The 61-acre Mount Sutro Open Space Reserve (Reserve) occupies the central and southern portion of the campus property. The Aldea Housing complex is located in the southeast portion of the campus site adjacent to the Reserve. The current average daily population at Parnassus Heights is estimated at approximately 17,400 persons, including faculty and staff, students, patients, and visitors. There are currently

nearly 7,400 UCSF faculty and staff employed at the campus site. About 580 residents currently reside in UCSF housing at the Parnassus Heights campus site.

Since the 1976 LRDP, the framework for growth at the Parnassus Heights campus has been contained in a Regents-adopted resolution ("1976 Resolution"), committing, among other things, to the following key elements:

- A "space ceiling" of 3.55 million gross square feet (gsf) of non-residential space (though existing space slightly exceeds this at approximately 3.7m gsf)
- A permanent campus boundary, with no further expansion of UCSF within the area bounded by Golden Gate Park/Oak Street, Ninth Avenue, Clarendon Avenue, and Clayton Street.
- A permanent Mount Sutro Open Space Reserve (that at the time was set at 58 acres and has since been increased to 61).

In October 2019 UCSF released the "Comprehensive Parnassus Heights Plan Final Report" ("CPHP") which sets forth the vision and strategy for a revitalization/redevelopment effort anticipated to occur over a 30-year period. The plan, which would require an amendment by the UC Regents to the 2014 LRDP, calls for development of up to approximately 2.05 million net additional square feet, and anticipates a substantial increase in the campus daytime population. Approximately 750 housing units (constituting about 673,000 square feet of the net growth) would be added in total, split between the Aldea area near the top of Mount Sutro and along a restored 4th Avenue at the western side of the campus between Parnassus and Kirkham Avenues, more than quadrupling the housing stock currently at Parnassus campus (222 units). The remaining 1.37 million square feet would primarily consist of net new clinical and research space, including a new hospital. The LRDP amendment would result in an increase in the estimated average daily population from approximately 18,500 in horizon year 2035 to about 25,300 in horizon year 2050, a net increase of approximately 6,800. When compared to the existing average daily population at the campus site of 17,400, the proposed LRDP amendment would result in a net increase in the average daily population by nearly 7,900 by 2050.

This proposed LRDP amendment would require the UC Regents to increase the space ceiling limit from the current 3.55 million square feet to a proposed 5.05 million square feet, and to adjust the boundaries but maintain the current minimum size of the Mount Sutro Open Space Reserve.

UCSF published a Draft Environmental Impact Report (DEIR) on the proposed CPHP in July 2020 and will seek FEIR certification and plan approval from the UC Regents at their meeting on January 20-21, 2021. UCSF would follow up afterwards with a project-specific EIR on the new hospital, which UCSF seeks to complete by 2030.

UCSF-City Coordination on CPHP

As a state institution, UCSF is generally not subject to the jurisdiction of the City, including the Planning Code, General Plan and Building Code, for approval of its plans and construction projects on its properties, though certain elements of UCSF's plans may require approval or cooperation of the City, such as improvements or changes to City-owned right-of-way and other City-owned infrastructure. The UC Regents certify CEQA documents prepared for UC projects, and the City may submit comments on these documents.

UCSF included in their community engagement efforts representatives from Planning staff along with other City agencies (including SFMTA, Office of Resilience & Capital Planning, Recreation & Parks). These efforts included a

Community Working Group and Community Advisory Committee, both of which were primarily comprised residents, merchants and stakeholder groups representing the immediately surrounding neighborhoods. As part of its Community Advisory Group process from late 2019 through May 2020, UCSF solicited and generated ideas for how the university could provide additional community investments and improvements that would address core issues of concern, particularly around transportation, housing, and open space.

On January 16, 2020, Mayor Breed, along with Board of Supervisors President Norman Yee and Supervisor Dean Preston (whose districts, D7 and D5, include the Parnassus campus), authored a letter to UCSF Chancellor Sam Hawgood. The letter expressed a desire that UCSF work collaboratively with the City to address the growth and changes proposed by the CPHP. Specifically, the Mayor and Supervisors called for the Planning Department to convene a "stakeholder process" with UCSF to ensure City and community voices are heard and addressed, such as around issues of transportation and housing, among other issues. The ultimate goal of this process would be to draft a mutually-ratified Memorandum of Understanding (MOU) between the City and UCSF that addresses these issues by describing commitments of both parties and processes for moving forward.

On June 4, 2020, Planning Department staff and UCSF staff presented the CPHP to the Planning Commission as an informational item.

MOU Process

Following completion of the comment period on UCSF's Draft EIR for the CPHP in late summer 2020, the City and UCSF initiated a community process to solicit input on an MOU between the City and UCSF and began negotiations with UCSF. Two public workshops have been held to date (as of publication of this memo), attended by over 50 members of the public:

> *September 29, 2020:* This workshop provided an introduction to the concept and legal framework for an MOU to the public and provided opportunity for the public to weigh in, through both small break-out discussion groups as well as comment/Q&A session with the whole attendance, on their ideas and priorities for community investments by UCSF and MOU terms.
>
> *December 9, 2020*: This workshop provided a description for each topic of the then-proposed draft MOU terms that resulted from the City-UCSF discussions following the September workshop. Staff provided an overview, for each topic, of what was contained within the CPHP itself on that topic, a summary of the public input at the September 29 workshop, and a description of the MOU terms for that topic. Staff from the City and UCSF fielded questions and comments from the attendees in their reactions to the draft terms to date.

Following the December 9 workshop, City and UCSF staff continued to negotiate and refine draft MOU terms, especially in response to feedback given by the public on December 9 and thereafter.

A third public workshop is scheduled for Wednesday January 6, 2021, in order to provide an update on MOU changes since the December 9 workshop and answer questions and seek comment on the specific MOU language which will be available for review upon publication of this packet on December 31.

The Draft MOU provided in the Commission's packet for this hearing is the culmination of this process. Additional changes to the MOU could be made up until execution by both parties. As the execution of the MOU requires CEQA coverage itself, which is provided by UCSF's EIR on the CPHP, execution of the MOU will happen after the UC Regents certify the FEIR for the CPHP at their meeting on January 20-21, 2021. The signatories of the MOU on the City side will likely include the Planning Director, Executive Director of SFMTA, and other affected agency heads.

Draft MOU Terms

Following is a high-level summary of key MOU terms by topic, highlighting the proposals in the CPHP that relate to this issue, key community input, and draft MOU terms. The full draft MOU is attached to this memo for review. Note that some UCSF commitments and obligations on some topics will be delineated as mitigations in the CPHP FEIR, to be published at least 10 days prior to the Regents' consideration of the plan. These mitigations are not generally reflected or reiterated in the MOU to avoid confusion between the MOU and the EIR. For convenience and a full accounting of these key obligations, key mitigations to be included in the FEIR are noted below.

General City Coordination and Community Engagement

MOU Terms:

- UCSF will provide an annual written report to the City on progress in meeting the terms of the MOU, buildout of the CPHP, and a variety of information and data, including transportation and TDM data.
- UCSF will provide an annual informational briefing to the Planning Commission, if desired, on the status of the CPHP buildout, major projects, and progress toward meeting the terms of the MOU
- UCSF will provide the City, through the Planning Department, the opportunity to preview and comment on early (schematic) designs of major buildings
- City will make good faith effort to support implementation of the Project, including timely inter-agency coordination of any permits (eg infrastructure, streets) needed by UCSF and will establish a working group to help coordinate implementation of the MOU commitments.
- UCSF will continue to host at least one annual community meeting and post information online about the CPHP progress
- UCSF will increase its spending in local, small businesses by 50% by 2024 and implement "Shop Local" campaigns to promote local businesses in the campus vicinity.

Housing

CPHP Proposal:

- Add 762 housing units to the Parnassus campus, including a redevelopment of the Aldea complex and new housing along a re-established 4th Avenue

Community Input:

- Housing that is affordable to and available to UCSF's workforce, in addition to students and faculty, should be prioritized

- The pace of new housing should match the construction of non-residential, job-producing development

MOU Terms:

- UCSF will deliver a total of 1,263 net new units in San Francisco by 2050 (inclusive of the 762 included in the CPHP), half delivered by 2030, with the remaining half divided equally by 2040 and 2050. This would double UCSF's current housing portfolio citywide.

- UCSF will dedicate a share of its overall housing portfolio (i.e. existing plus new) as units affordable to UCSF employee households at up to 90% of AMI and up to 120% AMI according to the following schedule, with the affordable units split evenly between 90%AMI and 120%AMI:

    - 2030: 20% of all UC portfolio units will be affordable

    - 2040: 30% of all UC portfolio units will be affordable

    - 2050: 40% of all UC portfolio units will be affordable

- UCSF would commit to maintaining this affordable housing portfolio at least 30 years past the termination of the CPHP in 2050 (ie until at least 2080).

- Expansion of UC's Down Payment Support Program to include all employees who have worked at least 2 years in education or health care.

- Provision that UCSF can opt to satisfy up to 200 of its affordable housing obligation through payment of in-lieu fee, provision of land to the City, and other measures.

Transportation & Streets

CPHP Proposal:

- Various loading and drop-off improvements around the campus

- Improved circulation, safety and wayfinding on Irving and Parnassus

Community Input:

- Increase Muni service and capacity, especially N-Judah

- Improved multi-modal connections

- Comprehensive TDM program

- Early implementation of transportation investments

MOU Terms:

- UCSF to pay a Transportation Contribution of $10.58/sf towards transit improvements serving campus,

estimated at roughly $20m for the full plan. SFMTA will use these funds to improve transit service to the Parnassus campus. The Contribution will be paid at issuance of foundation permit for each building.

- N-Judah stop improvements at 2nd/Irving

- UCSF will work with SFMTA to pursue better multi-modal connections to campus, including an improved bicycle route from Golden Gate Park.

CPHP EIR Mitigations:

- UCSF will implement Transportation Demand Management program enhancements to reduce average daily vehicle trips by at least 15% from estimated new average daily vehicle trips without these enhancements

- UCSF will implement a patient transit pass program by June 30, 2025, and a petition to run a referendum on a student transit pass will be reviewed and voted on by the UCSF student government assembly by June 30, 2025

Workforce Development (Jobs) and Education

CPHP Proposal:

- Utilize City-UCSF partnerships on job- training/internships (EXCEL – Excellence Through Community Engagement Learning) and construction employment opportunities (CCOP – Community Construction Outreach Program) to provide local employment opportunities from the Project.

Community Input:

- Train and hire SF residents to stabilize local communities

- Expand programs that provide STEM educational and internship opportunities to San Francisco youth, especially low-income students of color

MOU Terms:

- Increase the number of participants in the EXCEL program and expand to include additional job classifications

- Negotiate a First Source hiring agreement, with a 30% local hire goal for certain operational jobs, within two years of MOU execution

- City and UCSF to develop "upskill training" programs for graduates of the EXCEL Programs

- 30% local hire goal for construction jobs in the Project

- Extend the CCOP/CityBuild partnership

- Maintain and expand UCSF partnerships with SFUSD, including, but not limited to, support for the Science and Health Educational Partnership (SEP) High School Internship Program and the Center for

Science, Education and Outreach (CSEO).

Health Care Services

CPHP Proposal:

- Maintain ongoing partnerships with City and other providers:
    - Physician support for ZSFG hospital, including emergency psychiatric services and Level 1 trauma care
    - Behavioral health services
    - Supportive housing programs
    - HIV prevention, mental health, and substance abuse services
    - Infant, child, and adolescent psychiatry
    - Covid Community Public Health Initiative

Community Input:

- Psychiatric care
- Geriatric primary care
- Skilled Nursing Facilities (SNF) and subacute services

MOU Terms:

- Identify opportunities to increase care, especially adult inpatient psychiatric beds, to Medi-Cal recipients
- Identify opportunities with DPH for pediatric inpatient psychiatric care and expansion of mental health support services for school-age children
- Explore developing a Crisis Stabilization Unit
- Increase mental health care career opportunities for underrepresented populations

Open Space and Cultural Resources

CPHP Proposal:

- Wayfinding to Mt Sutro from Golden Gate Park and city streets
- Publicly accessible elevators in UCSF buildings to assist with vertical ascent to Mt Sutro trails
- UCSF financial support for the Sutro Stewards' "Health in Nature" Program + access to classroom space for educational activities

Community Input:

- Improved connections to Mt Sutro from Golden Gate Park
- Preservation of WPA-era "History of Medicine in California" murals in Toland Hall

MOU Terms:

- Maintain total Reserve acreage and natural trail design
- Wayfinding improvements for campus and Reserve trails
- Continued implementation of Mt. Sutro Vegetation Management Plan and coordination with City Recreation & Parks Department on management of adjacent Interior Greenbelt

CPHP EIR Mitigations:

- UCSF will convene a Task Force by the end of 2021 to advise on options for the display of the "History of Medicine" murals in a publicly accessible setting, either on a UCSF campus or a museum or other institution. The Task Force will include the Chair of the City's Historic Preservation Commission, or their designee. (In October 2020 UCSF contracted with a historic preservation contractor to safely remove and store the murals for future relocation).

Required Commission Action

No action by the Commission is being requested at this time.

Recommendation: None - Informational

Attachments:

Draft Memorandum of Understanding between City and UCSF

DRAFT

12.31.20 UCSF Response

MEMORANDUM OF UNDERSTANDING

University of California, San Francisco – Comprehensive Parnassus Heights Plan

This MEMORANDUM OF UNDERSTANDING (this "**MOU**" or "**Agreement**") dated as of _____, 2020, is made by and between the City and County of San Francisco, a municipal corporation (the "**City**"), acting by and through its Planning Department, Municipal Transportation Authority, and Mayor's Office of Economic and Workforce Development, and the Regents of the University of California, on behalf of its San Francisco campus ("**UCSF**") (collectively, the "**Parties**," and each a "**Party**") in connection with UCSF's implementation of the Comprehensive Parnassus Heights Plan (the "**CPHP**" or "**Project**") at its oldest and largest campus, which includes the UCSF Helen Diller Medical Center Program at Parnassus Heights.

RECITALS

A. The Parties acknowledge that UCSF is a recognized leader in the regional health care system by providing highly specialized health care, with acclaimed faculty physicians, and multi-disciplinary teams of psychologists, nurses, pharmacists, dentists, social workers, and physical therapists who are leading in comprehensive and compassionate patient care, pioneering research, training the next generation of leaders, and shaping public policy to advance mental and physical health. The Parties acknowledge UCSF's longstanding commitment to diversity and reducing health disparities through discovery, policy, advocacy, and community partnerships. UCSF is dedicated to advancing mental and physical health across the lifespan for the people of the Bay Area and northern California. UCSF has ongoing agreements with the City and other partners in the City to implement a variety of mental health programs including, supportive housing programs; emergency psychiatric services and Level 1 trauma care; HIV prevention, mental health, and substance abuse services; infant, child and adolescent psychiatry; and substance abuse and addiction therapy, for the benefit of a diverse patient population.

B. UCSF affirms its continued partnerships with the City in response to the COVID-19 pandemic through its COVID Community Public Health Initiative and ongoing pandemic response efforts in key areas, including strategic testing, contact tracing, and safe campus re-opening.

C. The Parties acknowledge UCSF's commitment to address healthcare priorities that serve diverse populations and advance healthcare and health equity through its efforts with the Anchor Institution Initiative, the UCSF Center for Vulnerable Populations, the launch of the Partnership for Research in Implementation Science for Equity Center, and other programs.

D. The City recognizes the significant contributions UCSF makes by providing world-class care at Zuckerberg San Francisco General Hospital and Trauma Center ("**ZSFG**"), a historic partnership that began in 1873 and recently included the collaboration to build a new UCSF research facility at ZSFG. The City further recognizes the major economic impact that UCSF has on the neighborhood, City, and Bay Area regional communities, including providing approximately $273.5 million annually in uncompensated care and charity health care for

patients, and supports UCSF's current efforts to responsibly plan for its future needs. As the second-largest employer in the City and the fourth largest in the Bay Area, UCSF's estimated economic output in the nine-county region was nearly $9 billion, according to its last economic impact report in 2016.

E. State law requires hospital facilities to comply with seismic safety building standards as defined by the Office of Statewide Health Planning and Development ("**OSHPD**"). In order to comply with these standards, Moffitt Hospital must be structurally retrofitted or decommissioned as an inpatient facility by 2030. UCSF seeks to reimagine and create a 21st century health sciences campus that will aesthetically complement, and be fully integrated into the surrounding neighborhood and natural beauty of the Mount Sutro Reserve, keep pace with the growing health care needs of the City with a new hospital, and better serve its public mission through new, contemporary facilities that leverage the advantage of connecting world-class scientific research and health sciences education to patient care.

F. UCSF is part of the University of California, a constitutionally created entity of the State of California, with "full powers of organization and government" (Cal. Const. Art. IX, Section 9).

G. The UCSF Parnassus Heights campus site comprises approximately 107 acres of land located in the Inner Sunset mixed-use neighborhood and adjacent to the Haight Ashbury, Cole Valley and Forest Knolls neighborhoods in the City (the "**Campus**"). UCSF's facilities are concentrated at the north end of the Campus, where Moffitt and Long hospitals, five professional programs, clinics, research, housing, parking, and other support uses are located. The physical core of the Campus is located along Parnassus Avenue, which extends east-west, bisecting this portion of the Campus. The Campus is located south of Golden Gate Park, and is bounded in the north by Irving Street which includes the SFMTA N-Judah line. The 61-acre Mount Sutro Open Space Reserve (the "**Reserve**") occupies the central and southern portion of the Campus. The Aldea Housing complex is located in the southeast portion of the Campus adjacent to the Reserve.

H. In 2018, UCSF began a planning process to create a new vision for the Campus, which involved engagement with various campus and community stakeholders, including the City, to develop the CPHP. UCSF established a Community Working Group and an Advisory Committee that met between October 2018 and June 2020 to solicit public input on the Project, including meetings, open houses, walking tours, town halls, and other workshops. In 2019, UCSF published a Community Ideas Report that summarized the ideas and feedback received during the community outreach process.

I. The CPHP provides for the development of approximately 2.90 million gross square feet ("**gsf**") of new building space. The net increase in building space at the Campus under the CPHP would be approximately 2.04 million gsf, when accounting for demolition that was approved under the 2014 Long Range Development Plan ("**LRDP**") but yet not implemented, and potential additional building demolition that would occur under the CPHP. The CPHP includes an "**Initial Phase**" that comprises: (1) Irving Street Arrival improvements, (2) Research and Academic Building, (3) New Hospital, and (4) initial Aldea Housing Densification, and as well as other Initial Phase improvements. The Initial Phase would account

for approximately 1.43 million gsf of new building development, and is anticipated to be completed by approximately year 2030. Beyond the Initial Phase, the "**Future Phase**" encompasses the remaining approximately 1.47 million gsf of new building development described in the CPHP envisioned for completion by the horizon year of 2050.

J. Approval of the Project by the Board of Regents would comprise an amendment to the adopted 2014 LRDP. The Board of Regents has the responsibility for considering the LRDP amendment. If the LRDP amendment to incorporate the CPHP is approved, it would be used to guide the development of the Campus through the next 30 years.

K. In 1976, the Board of Regents adopted a resolution to address potential impacts associated with development of the Parnassus Heights campus site, the Regents designated the Mount Sutro Open Space Reserve as a permanent open space; adopted a limit on the amount of built space of 3.55 million gsf, commonly referred to as the "space ceiling," within the newly designated campus site boundaries among other actions taken. At that time, the space ceiling applied to all building space, but excluded residential uses in UCSF buildings on Third, Fourth, Fifth, and Parnassus Avenues and Kirkham and Irving Streets. The 2014 LRDP revised the Regents' Resolution to exclude other residential square footage within the campus site from the space ceiling (i.e., Aldea Housing and University House). The 2014 LRDP identified strategies to reduce the space ceiling overage over the life of the 2014 LRDP. Project approval of the space ceiling increase by the Board of Regents allows UCSF to create modern healthcare facilities at the Campus, reflecting the growing needs of the region.

L. On January 16, 2020, Mayor London Breed, along with then Board of Supervisor President Norman Yee and Supervisor Dean Preston, sent a letter to UCSF Chancellor Sam Hawgood indicating a desire to engage UCSF in creating an MOU to address issues related to the Project, including additional stakeholder engagement to solicit public input. On January 27, 2020, Chancellor Sam Hawgood sent a letter in response and acknowledged UCSF's commitment to ongoing engagement with the community and the City.

M. The Parties acknowledge the Memorandum of Understanding entered into by the Parties on February 17, 1987 regarding the coordination of UCSF planning activities citywide ("**1987 MOU**"). The Parties further acknowledge that the 1987 MOU remains in effect and the scope of this Agreement is limited to the Parties' collaboration regarding the Project.

N. In the fall and winter of 2020, the City hosted and conducted public meetings and outreach to directly solicit input regarding this MOU, which included expanding on and refining the community investment concepts UCSF presented from its CPHP community process that culminated in June 2020.

O. The Parties enter into this MOU to recognize their mutual interests and goals; address community concerns expressed during the extensive community input process with respect to the CPHP; and to advance investment in UCSF's facilities and programs in research, patient care, education, and community service while improving the aesthetic and functional design of the campus environment.

P. The Parties acknowledge that UCSF and the City voluntarily agree to enter into this Agreement. The community investments contained herein are in addition to the Project's Mitigation Monitoring and Reporting Program ("**MMRP**") required under the California Environmental Quality Act ("**CEQA**") and are not part of the CEQA process related to the Project.

AGREEMENT

NOW, THEREFORE, for the mutual promises set forth in this Agreement, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged and agreed, the Parties agree as follows:

I. RECITALS; EFFECTIVE DATE

The Parties agree that the above Recitals are true and correct, and incorporate the Recitals into this Agreement. This Agreement will become effective on the date (the "**Effective Date**") that it is executed and delivered by both Parties, following the necessary Project approvals.

II. COORDINATION TO IMPLEMENT THE PROJECT

A. General UCSF - City Coordination.

1. The City acknowledges that this MOU applies to the Project and any implementing projects of the CPHP, including the Helen Diller Hospital (the "**New Hospital**"). UCSF staff and City staff, through the City's Planning Department, will meet annually through completion of the Project or 30 years following approval of the CPHP, whichever occurs first. The City's Planning Department will invite and coordinate with relevant City agencies, including but not limited to the San Francisco Municipal Transportation Agency ("**SFMTA**"). Such meetings will be used to review:

(a) Implementation of the Project, compliance with this MOU by both Parties, and progress toward meeting the commitments herein;

(b) UCSF's long-range development plan and ongoing development, projects, transportation and housing programs, including progress toward implementing the Project and any new or pending major proposals to amend the LRDP; and

(c) The City's long-range development, transit and infrastructure plans, and projects of relevance to the Project.

~~2.~~ In an effort to efficiently review and process any permits for the Project, the City will refer such matters to the City's Infrastructure Task Force or to the City department responsible for review and issuance of the permit. City Planning, SFMTA, Office of Economic and Workforce Development ("**OEWD**"), and Mayor's Office of Housing and Community Development ("**MOHCD**") will also create a working group, with a single contact person from each department, responsible for meeting and reviewing requests from UCSF that relate to the Project (the "**Parnassus Work Group**"). The Parnassus Work Group will meet periodically to

ensure that all matters relating to this MOU are coordinated and efficiently prosecuted to completion.

3. Key Contacts. UCSF and the City each will assign designated key contacts (i.e., manager, employee, or other agent with management level authority) and key staff members who will meet, collaborate and negotiate diligently in good faith on its behalf in implementing this MOU.

(a) The City's initial designated key contacts are Joshua Switzky of the City's Planning Department, and Sarah Jones of SFMTA and Jon Lau of the OEWD.

(b) UCSF's initial designated key contacts are _____ and _____.

(c) Designated key contacts may be changed by notice given in accordance with the Notices provision of this Agreement.

4. Recommendations. In addition to the annual meeting described in Section II.A.1 of this Agreement, either Party may choose to advise the other in writing on any matters concerning master planning, construction and infrastructure, including suggestions for amendments to such plans or projects. The receiving Party will make a good faith effort to respond to the other Party regarding said recommendations in writing.

5. Design. UCSF will provide the City, through the Planning Department, the opportunity to preview the design and site plan of a new project under the CPHP that exceeds 100,000 gross square feet of total building space and abuts the City right-of-way, including but not limited to the New Hospital, prior to the conclusion of the schematic design process. Upon mutual agreement of the Parties, other major capital projects that do not meet the above criteria, will be made available for preview by the City. The City and other relevant City agencies, including but not limited to the SFMTA, may share concerns regarding relevant design or performance guidelines, standards and policies of the City. UCSF will make a good faith effort to respond, and address concerns raised by the City, in writing.

6. Planning Commission Briefings. At the City's Planning Director's request, UCSF will provide one annual informational briefing to update the City Planning Commission on the Project.

7. Annual Report. UCSF will provide an annual written report to the City's Planning Director regarding the status of all MOU commitments, including but not limited to: (a) status of major construction projects completed, underway, or pending; (b) the Housing Contribution including the number of UC Affordable Units located at each project site, the unit type, and the associated AMI level and rent of each UC Affordable Unit, and upon further request, the City may review additional reasonable information related to the distribution and occupancy of the UC Affordable Units (c) data related to travel patterns of UCSF's populations, including mode share, transit use by provider, parking utilization, shuttle ridership, and existing transportation demand management ("**TDM**") programs that are regularly evaluated to identify new and/or improved TDM strategies; and (d) available data regarding population growth as it becomes available for future CPHP projects. The first annual report will be provided to the City within

ninety (90) days following the anniversary date of the Effective Date, and subsequent annual reports before the end of each calendar year. Each annual report will be a public document, posted on UCSF's and the Planning Department's websites.

B. Community and Small Business Engagement.

1. UCSF will conduct community engagement meetings for the general public and interested stakeholders regarding the Project at least once per year. Such community meetings will focus on providing Project-related updates and soliciting feedback from the community. The community engagement commitments in this Section are in addition to any statutorily required public process pursuant to CEQA, for the Project.

2. UCSF will strive to ensure that its engagement herein, including any community advisory bodies or committees composed of members of the public, includes a diverse population representative of the socio-economic, cultural and racial diversity of both the surrounding neighborhoods and the City at large.

3. During the Initial Phase of the CPHP and until the New Hospital is complete, UCSF will continue to explore opportunities to convene community stakeholders and the City regarding the design and development of the New Hospital.

4. UCSF will make information about the Project readily accessible to the public through online platforms, including but not limited to, the UCSF website, electronic newsletters, or other digital platforms, which will include an option for the public to contact UCSF with questions or comments.

5. In 2019, UCSF launched the Anchor Institution Initiative in which UCSF pledges to leverage its business operations to advance economic security and opportunity in under-resourced communities to expressly aid in improving health equity. The goal of the Anchor Institution Initiative is to collaborate with community partners in the San Francisco Bay Area by leveraging UCSF's workforce development, procurement and community investment resources. The Anchor Institution Initiative plan includes an initial three-year build that focuses on four strategic areas: workforce development, procurement, community investment, and creation of an anchor office to manage the work, track the outcomes, and engage internal and external stakeholders. UCSF has committed to increase its spend with small, local and diverse businesses by at least fifty (50) percent by 2024. In addition to this effort, UCSF commits to increase its support local, small and diverse businesses in the City by hosting targeted supplier diversity events and launching seasonal campaigns, such as "UCSF Shop Local" to promote businesses in the Campus vicinity, including but not limited to the Inner Sunset and Cole Valley merchants. UCSF will meet annually with MOED to investigate potential partnering with respect to these business promotion activities and to determine ways in which the parties can collaborate and collectively build upon their respective efforts.

III. PROJECT IMPROVEMENTS AND INVESTMENTS BY UCSF

A. Community Workforce.

1. UCSF has a longstanding commitment to workforce development programming and employment pipelines for under-resourced populations. Through the Anchor Institution Initiative, UCSF remains committed to strengthening employment opportunities for San Francisco youth through education and internship opportunities. The commitments set forth in this MOU are in addition to the robust efforts underway.

2. The Parties share a mutual commitment to advance equity, invest in the growth and development of the City's workforce and continue to create employment training opportunities through a work-based learning program and provide classroom and paid work experience to low-income San Franciscans seeking entry-level employment opportunities in the health and life sciences sectors through UCSF's flagship workforce development program, Excellence through Community Engagement and Learning ("**EXCEL**").

3. UCSF agrees to align the Anchor Institution Initiative and existing workforce development efforts and allocate financial resources to the following initiatives during the Initial Phase of the CPHP:

(a) Evaluate expansion of the EXCEL program to accommodate approximately forty-five (45) program participants annually. Representatives from UCSF and OEWD will meet within one year of the Effective Date to discuss this evaluation and intended program expansion.

(b) Help to develop and participate in a consistent funding source for EXCEL internship wages.

(c) Launch new training programs, within two years of the Effective Date, that expands workforce development to possibly include the following job classifications: Janitorial, Sterile Processing, Medical Assistant, Psychiatric Technician, Patient Safety Attendant, Tech and IT Support and Clinical Research Coordinator.

(d) Partner with the City to implement upskill training for graduates of EXCEL programs (e.g., Medical Administrative Assistant to Medical Coding, Sterile Processing, etc.).

(e) Collaborate with the City to improve the effectiveness of OEWD program reporting, training curriculum feedback, participation in hiring fairs, and donations of surplus equipment for use in training programs.

(f) Within two years of the Effective Date, the Parties will meet to negotiate a first source hiring agreement that establishes a first source hiring goal for UCSF Parnassus Heights operations goals. The purpose of this agreement will be for the Parties to make a good faith effort of 30% of available entry level positions with referrals from the City's Workforce Development System and Health Care Academy and similar UCSF job training programs for disadvantaged individuals, for the Initial Phase of the Project. Qualifying positions can be

vocational jobs, non-clerical/clerical, long and short term temporary assignments and internship/externship opportunities. Any agreement will be subject to and in accordance with University of California and UCSF policies and collective bargaining unit agreements, including but not limited to Regents Policy 5402, and UCSF's obligations as set forth by the Office of Federal Contract Compliance Programs. On or before the start of the Future Phase, the parties will negotiate in good faith to extend this first source hiring agreement, with such terms as the parties wish to keep and to change, with respect to operations for facilities to be constructed in the Future Phase.

4. The UCSF Office of Community & Government Relations has general oversight of its hiring program through the management of UCSF's Community Construction Outreach Program ("**CCOP**"). The CCOP is charged with ensuring that San Francisco resident workers are made aware of employment opportunities, and are fairly and equitably considered for hire at the time job opportunities become available. Throughout the Project, UCSF will make a good faith effort to reach a hiring goal of at least 30% of total construction hours to be performed by qualified San Francisco resident tradespersons. UCSF's intent in adopting this goal is to strengthen the economic opportunities it provides to the community, increase employment opportunities for San Francisco residents and engage local unions in innovative partnerships. Accordingly, UCSF will require the Project's prime contractor and all subcontractors to make a good faith effort to assist UCSF in reaching the 30% goal. Following the Initial Phase, the Parties acknowledge that the 30% hiring goal may change to reflect future goals and the then availability of local workers. The Parties will work together in good faith so that the Project goals are consistent with other development projects in San Francisco and other University of California projects in California. UCSF commits to make a good faith effort to:

(a) Extend the CCOP/OEWD-CityBuild partnership, where possible under UCSF contracting requirements, for the Initial Phase of the Project.

(b) In partnership with the City, UCSF will enter into a workforce development agreement ("**Workforce Development Agreement**"), similar in structure and intent to the ZSFG/UCSF agreement, focused on pre-apprentice training and supportive services specific to local hire construction opportunities emerging from the Project consistent with a mutually agreed upon budget. Representatives from UCSF and OEWD will meet to discuss and finalize the Workforce Development Agreement prior to certification of the EIR for the New Hospital. The Workforce Development Agreement will include the 30% hiring goals set forth above.

(c) As part of the Workforce Development Agreement, examine the possibility of including CityBuild's Construction Administrative Professional Services Academy for training and referral to administrative/professional positions associated with the Initial Phase of the Project.

5. UCSF, through and by and among the third-party contractors selected to develop the New Hospital, will enter into a Community Workforce Agreement with the San Francisco Building and Construction Trades Council and its affiliated unions, regarding certain wage terms, individual trade separations, or other labor-specific benefits related to construction of the New Hospital.

B. Community Care Initiatives: Supportive Housing and Mental Health Care.

1. UCSF reaffirms its commitment to maintain supportive housing programs operated by Community Housing Partnership or other similar nonprofit organizations, including providing behavioral health services. UCSF recognizes that these programs perform the critical function of housing individuals who have previously experienced homelessness, and constitute permanent supportive housing solutions for vulnerable populations in the City.

2. UCSF will continue providing physician support for ZSFG and other medical facilities, subject to and in accordance with the existing affiliation agreements and future service agreements between UCSF and the San Francisco Department of Public Health (the "**DPH**"). The Parties recognize the mutual benefits in this cooperative effort, in recognition that ZSFG is a community "safety net" hospital and the City's sole provider of emergency psychiatric services and Level 1 trauma care in the region.

3. UCSF reaffirms its desire to continue maintaining inpatient psychiatric beds at UCSF facilities in the City, subject to existing and future service agreements between UCSF and ZSFG or other medical facilities. In recognition of the substantial need, and subject to available space and funding, UCSF will make a good faith effort to maintain at least thirty (30) inpatient psychiatric beds.

4. The Parties acknowledge UCSF's consistent support for community-wide supportive housing and mental health care initiatives. UCSF reiterates its support for these programs and commits to further exploring innovative approaches to providing these services in the City, in partnership with the City.

5. The Parties acknowledge that in 2018, UCSF contributed $1 million to fund new inpatient psychiatry beds at St. Mary's Medical Center through collaborative efforts between various stakeholders, including UCSF, the City's Office of the Mayor and DPH.

C. Equity and Educational Opportunities

1. The Parties recognize UCSF's longstanding commitment and support of more than forty (40) pathway and pipeline programs that target elementary, high school and community college age students, through partnerships with San Francisco Unified School District ("**SFUSD**") and community-based organizations, to increase the number of underserved, low income students of color exposed to health and other professions related to science, engineering, technology and math ("STEM"). The Parties recognize that UCSF has a separate agreement with SFUSD that further documents UCSF's extensive commitments and investments in STEM programs in addition to those described in this Section III(C). UCSF will continue to identify and expand efforts that provide job shadowing and support STEM curriculum for SFUSD students, as identified in a separate memorandum of understanding between UCSF and SFUSD.

2. As part of UCSF's ongoing commitment to youth internship opportunities, UCSF hired its first Pipeline Manager in the Center for Science, Education and Outreach, based in the Office of Diversity and Outreach. This role will be focused on maximizing internship program capacity, and strengthening external partnerships with SFUSD and community based

organization in the City and County of San Francisco. UCSF agrees to continue to invest in pipeline programs to promote STEM opportunities for youth up to age 24, conduct outreach and provide training and internship opportunities for San Francisco youth. UCSF further affirms its commitment to collaborate with SFUSD and community organizations to advance equity in the health professions by exploring new strategic partnerships to increase participation in its pipeline programs, and continuing to promote STEM and Non-STEM educational and employment opportunities for San Francisco youth.

3. UCSF acknowledges its partnerships, subject to and in accordance with any related existing and future agreements, with: (i) the Science and Health Educational Partnership ("**SEP**") High School Intern Program, which selects SFUSD high school students to participate in an 8-week paid summer internship; (ii) the Center for Science, Education and Outreach ("**CSEO**"), CURE Internship that provides Black and LatinX students from SFUSD with an opportunity to participate in an 8-week paid research experience program; (iii) the CSEO year around school-based program that places CSEO coordinators in SFUSD partner schools where program staff are providing health career exposure and college access support directly to students throughout the year; and (iv) the partnership with UCSF, SFUSD, CSEO and SEP to support the SFUSD Mission Bay Link Learning Hub.

D. UCSF Investment in Behavioral Health Service Needs.

1. The Parties acknowledge UCSF's role in the City as a health care delivery system. UCSF has worked in consistent and close partnership with the City and DPH to deliver health care services to San Franciscans. The Parties will in good faith, continue to identify opportunities in the City to partner and collaborate on the expansion of behavioral health and substance use services.

2. UCSF reaffirms its desire to maintain inpatient psychiatric beds at UCSF facilities throughout the City, subject to existing and future service agreements between UCSF and ZSFG or other medical facilities. The Parties acknowledge that UCSF is a state-funded Institution for Mental Diseases and is prohibited from billing Medi-Cal for adult inpatient services. The Parties will explore partnerships and opportunities to increase the number of adult inpatient psychiatric beds for patients with Medi-Cal that are consistent with UCSF's licensure status in the City.

3. UCSF will continue to engage the City about the potential to develop a Crisis Stabilization Unit in the City.

4. The Parties will continue to explore increased access to care for Medi-Cal recipients with complex and treatment refractory illness. The Parties will collaboratively work to identify opportunities in the City to contract for the delivery of children's behavioral specialty health services in the areas of autism spectrum disorders, eating disorders, evidence-based therapies for suicidal and self-injurious adolescents, and other specialty mental health services.

5. UCSF, in collaboration with DPH, will explore the development of a children's inpatient psychiatric unit for children and adolescents in the City.

6. The Parties recognize the need in the behavioral health field to develop a workforce pipeline of diverse clinicians in the City and reinforce the Parties' mutual

commitment to identify resources to: (a) expand mentorship opportunities and support of child and adolescent psychiatric clinicians and practitioners, (b) provide scholarship opportunities for underrepresented medical and nursing students, (c) create new clinical learning opportunities within adolescent and adult psychiatry programs, and (d) partner with stakeholders such as the San Francisco Human Rights Commission to develop a workforce pipeline program specific for mental health career exploration for San Francisco's underrepresented and minority youth and young adults ages 13 through 24.

E. Housing: Contributing New Units.

1. Housing Contribution. UCSF seeks to continue to provide a range of affordable housing units for its population, especially for those employee households earning at or below 90% AMI and at or below 120% AMI. To the extent feasible, UCSF will identify opportunities to provide housing options that serve different households across income ranges. As used in this MOU, "**AMI**" means area median income as published annually by the MOHCD, which is derived from the income limits determined by U.S. Department of Housing and Urban Development ("**HUD**") for the City, adjusted solely for household size but not high housing cost area. If HUD ceases to publish such data for 18 or more months, the City will use credible substitute data to determine the affordability levels City-wide. UCSF commits to providing a minimum two thousand five hundred twenty (2,520) rental units in the City (the "**Housing Contribution**"), comprised of one thousand two hundred fifty-seven (1,257) units existing as of January 1, 2021 and one thousand two hundred sixty-three (1,263) net new units.

2. UC Affordable Units. By 2050, forty percent (40%) of the Housing Contribution, or one thousand eight (1,008) units, will be designated for UCSF employee households including trainee households earning at or below 90% and 120% AMI (the "**UC Affordable Units**"). The rent for the UC Affordable Units shall not exceed the maximum rent set by MOHCD by unit type for employee households earning at or below 90% and 120% AMI. The UC Affordable Units will be comprised of new and existing units of all unit types and will remain affordable at the designated AMI level for a minimum of thirty (30) years beyond the expiration of the CPHP in 2050.

UCSF will deliver:

(a) By 2030: six hundred thirty-one (631) net new units for a total of one thousand eight hundred eighty-eight (1,888) total units of the Housing Contribution, of which 20%, or three hundred seventy-eight (378) units will be UC Affordable Units. Of the UC Affordable Units at least one hundred eighty-nine (189) will be affordable for employee households earning at or below 90% AMI and one hundred eighty nine (189) units will be affordable for employee households earning at or below 120% AMI;

(b) By 2040: three hundred sixteen (316) net new units for a total of two thousand two hundred four (2,204) total units of the Housing Contribution of which 30%, or six hundred sixty-one (661) units will be UC Affordable Units. Of the UC Affordable Units at least three hundred thirty (330) units will be affordable for employee households earning at or below 90% AMI and three hundred thirty-one (331) units will be affordable for employee households earning at or below 120% AMI; and

(c) By 2050: three hundred sixteen (316) net new units for a total of two thousand five hundred twenty (2,520) total units of the Housing Contribution, of which 40%, or one thousand eight (1,008) units will be UC Affordable Units. Of the UC Affordable Units at least five hundred four (504) will be affordable for employee households earning at or below 90% AMI and five hundred four (504) units will be affordable for employee households earning at or below 120% AMI.

(d) Housing Program Credit. UCSF will receive a one to one credit towards the UC Affordable Units contribution for each employee household earning at or below 90% AMI or at or below 120% AMI that purchases a home through the Down Payment Support Program or other home buying assistance program sponsored by UCSF or UC.

3. Down Payment Support Program. In addition to home buying support programs offered to academic senate faculty and senior management executives through the UC Office of the President, the San Francisco campus offers a down payment support program ("Down Payment Support Program") to UCSF employees pursuing home ownership but who are not eligible for the UCOP program, and who have worked in health care or education for at least two years, work at least twenty (20) hours a week at UCSF, and commit to continuing to work at UCSF for at least two years after buying a home. This Down Payment Support Program provides eligible employees financial support for down-payment and other costs associated with purchasing a home in eligible areas. UCSF will continue to invest in other housing assistance programs for its employees.

4. Additional Options for Certain UC Affordable Units. UCSF reserves the option to provide up to two hundred (200) of the new UC Affordable Units through any combination of the following:

(a) Pay the City's per-unit equity gap financing cost published annually by the MOHCD (the "**Gap Financing Cost**") into the Citywide Affordable Housing Fund; and/or

(b) Subject to prior approval of the Director of MOHCD, partner with a third-party developer to deliver permanently affordable units for non-UCSF populations; and/or

(c) Subject to City's prior approval and MOHCD's willingness to accept the land, provide land to the City consistent with Section 413.6 of the San Francisco Planning Code, in which case UCSF will be given credit for the number of units determined under Section 413.6; and/or

(d) Subject to prior approval of the Planning Commission (and the Board of Supervisors if any approval is appealed to it), convert an exclusively tourist hotel to residential use subject to and in accordance with the requirements of the Tourist Hotel Conversion Ordinance, San Francisco Administrative Code Chapter 41F; and/or

(e) Receive a one to one credit pursuant to the Housing Program Credit, Section III(E)(4).

5. Rent Ordinance. No existing housing unit currently under the jurisdiction of the San Francisco Rent Ordinance (SF Administrative Code, Chapter 37) will be used to satisfy the

Housing Contribution, and UCSF agrees not to acquire any existing housing units currently subject to the San Francisco Rent Ordinance.

6. Further Review. In accordance with Section V.C.4 of this Agreement, the Parties acknowledge that the full buildout of the CPHP would not satisfy the Housing Contribution and therefore, a portion of the Housing Contribution may require future permitting and environmental review in compliance with CEQA. The Parties retain discretion to make revisions based on the environmental review documents and information.

7. Modification of Housing Contribution. The obligations contained hereunder will be contingent on UCSF proceeding with the Project as contemplated and securing successful entitlement and requisite approvals to implement the Project. UCSF agrees to proportionally satisfy its obligations hereunder, if UCSF reduces the scope and scale of the Project. The Parties will meet and confer on any proportional reductions to the Housing Contribution based on the extent to which the Project has been reduced, at which time UCSF and the Planning Director may revise the Housing Contribution. Any change to the Housing Contribution must be agreed upon by UCSF and the Planning Director in writing. UCSF and Planning will work together diligently and in good faith to satisfy the Housing Contribution. MOHCD agrees to use any payments made by UCSF per this Section for affordable housing, in neighborhoods surrounding the Campus, to the extent possible.

F. Transportation and Mobility Improvements.

1. Shared Transportation Responsibility. The Parties acknowledge the interdependent relationship between UCSF and the surrounding transportation system, and recognize their shared responsibility to provide a full complement of transportation services to the Campus community.

2. N Judah Capacity. SFMTA will endeavor to increase capacity serving UCSF, potentially including modifications to support three-car trains and provide more frequent service including during non-peak hour periods to align with UCSF travel demand and/or augmenting or modifying bus service, in order to better meet the needs of the Campus as well as the broader City. UCSF will support SFMTA in the analysis and planning for increased transit service to the Campus.

3. UCSF Transit Improvements. Concurrently with the Irving Street Arrival Improvements project, UCSF will upgrade, and/or pay SFMTA to upgrade the platform at the UCSF Parnassus stop for three-car trains as an in-kind contribution to improve the pedestrian realm and encourage transit use by making the area more comfortable for people waiting for SFMTA transit service. Upon completion, the City will apply an "**Applicable Credit**" towards the Transportation Contribution. The Applicable Credit means the actual and reasonable out of pocket costs paid by UCSF for completing the platform upgrade. UCSF will also improve wayfinding and implement other circulation and arrival improvements. UCSF will also implement feasible safety improvements at the intersection of Arguello Boulevard, Carl Street, and Irving Street. All improvements within the City's right-of-way will comply with SFMTA standards and guidelines, which will be approved through SFMTA review.

4. Transportation Contribution. UCSF will pay to SFMTA a transportation contribution (the "**Transportation Contribution**") for the Project to increase the capacity and the frequency of service of the N-Judah and/or other Muni lines, services, facilities provided by SFMTA that directly serve Campus community. Funds collected from the Transportation Contribution shall be utilized for transportation improvements that benefit UCSF's populations and serve the Campus community, subject to the approval of the SFMTA Board.

(a) Calculation. The Transportation Contribution will be calculated on the basis of the amount of net new gross square feet resulting from the Project, multiplied the following fixed rate: $10.58 per gross square foot. This rate was mutually agreed upon by the Parties and will apply to all land use categories except parking uses, including parking structures. The rate will be adjusted on an annual basis every January 1, starting January 1, 2022, based on annual changes to the Consumer Price Index ("**CPI Index**"). CPI Index means the Consumer Index for All Urban Consumers (base years 1982-1984 = 100) for the San Francisco-Oakland-San Jose area, published by the United States Department of Labor, Bureau of Labor Statistics. If the CPI Index is discontinued during the term of this MOU, such other government index or computation with which it is replaced will be used in order to obtain substantially the same result as would be obtained if the CPI Index had not been discontinued or revised.

(b) Timing of Payment. The Transportation Contribution will be paid upon issuance of the foundation permit for the commencement of construction for each project under the CPHP.

5. Parnassus Avenue Streetscape Plan. The Parties acknowledge that prior to the CPHP planning process and CEQA process, UCSF developed the Parnassus Avenue Streetscape Plan in collaboration with SFMTA, which aims to create a sense of place on the street while balancing competing needs of different street users by reallocating curbside uses and installing pedestrian safety improvements such as widened crosswalks and curb extensions (i.e., bulb-outs). UCSF continues to implement the Parnassus streetscape plan and commits to the following: (a) explore additional pick-up and drop-off activities and commercial loading activities related to the CPHP, (b) refresh the plan to include a curb management plan within two years of the Environmental Impact Report ("**EIR**") certification for the New Hospital and share said plan with SFMTA, and (c) evaluate the streetscape plan to consider intersection modifications and traffic control devices at Judah Street – Parnassus Avenue/Fifth Avenue; Parnassus Avenue/Fourth Avenue; Parnassus Avenue/Third Avenue; Parnassus Avenue/Hillway Avenue, as needed to address additional traffic delay and accessibility concerns related to the CPHP.

6. Streets. The Parties further acknowledge that all design and construction within the City right-of-way will be subject to City standards, review processes, permits and approvals. UCSF further commits to:

(a) Engage SFMTA in the design and implementation of street and intersection improvements for the Project in the City right-of-way; and

(b) Design campus pathways to become more naturalistic as the pathways approach the Reserve, and improve wayfinding along trails throughout the Campus.

7. Bicycle Route. UCSF will continue to partner with the City to identify a bicycle route between Golden Gate Park and the Campus.

8. Sidewalks and Streets. UCSF acknowledges that any work and/or encroachment into the public right-of-way, including certain sidewalks and streets adjacent to the Project, is subject to all laws and requirements of the City, including compliance with the City's Planning Code Section 138.1 for an equivalent private project at the Campus. In addition, UCSF commits to abide by the City's Public Works Code Section 706 concerning maintenance of all City sidewalks adjacent to the Project.

9. Amendment of Transit Commitments. The obligations contained in this MOU are contingent on UCSF proceeding with the Project as contemplated and securing successful entitlement and requisite approvals to implement the Project. UCSF agrees to satisfy its obligations hereunder, unless UCSF reduces the scope and scale of the Project as contemplated and at which time the Parties may revisit the commitments, based on the changes to the Project following CEQA review as necessary. UCSF agrees to proportionally satisfy its obligations hereunder if UCSF reduces the scope and scale of the Project. If UCSF proposes to reduce or materially alter the scope of the Project, the Parties will meet and confer in good faith to determine the manner in which the commitments made in this MOU will be proportionally revised. Any such revision will be subject to mutual agreement following any required environmental review.

G. Conservation, Stewardship, and Open Space.

1. Modification to the Reserve Footprint. The Parties acknowledge that there is the potential for the footprint of the New Hospital and/or the widening of Medical Center Way to extend into the Reserve. UCSF will replace any area of the Reserve that is lost due to development under the CPHP by designating new Reserve area elsewhere on the Campus and contiguous to the Reserve in an amount equal to or greater than the area lost, in order to maintain no less than sixty-one (61) acres of the Reserve. Any areas newly proposed for Reserve designation, if presently developed with structures or paved areas, must be appropriately landscaped and returned to a natural condition consistent with the character of the Reserve prior to disturbance or construction of any areas of the Reserve to be removed from such status.

2. Wayfinding to Reserve. In connection with the completion of the Initial Phase, UCSF will provide wayfinding signage to clearly indicate trailhead locations for the Reserve that may not be immediately obvious to the community.

3. Vegetation Management Plan. UCSF seeks to ensure the safety of the Reserve for its residents, patients, visitors, campus buildings, and neighboring homes. Across California, the multi-year drought caused widespread decline in the overall health of trees, resulting in at least 66 million dead trees statewide. This decline is also evident in the Reserve. UCSF began a process in 2015 to develop a management plan to ensure the long-term health and sustainability of the Reserve.

To develop the Mount Sutro Open Space Reserve Vegetation Management Plan (the "**Vegetation Management Plan**"), UCSF led an extensive public process involving a Technical

Advisory Committee ("**TAC**"), comprised of local experts in forestry, hazard reduction, biology and habitat restoration to provide guidance on best practices in forest management. UCSF held four TAC meetings, which were open to the public, followed by two community meetings and public tours of the Reserve, giving the public many opportunities to help shape the plan, discuss their concerns and provide feedback. This was followed by the launch of an environmental review process. UCSF held a scoping meeting in February 2017, followed by a public hearing on the Draft EIR in August 2017. During the extended public comment period, UCSF received and responded to more than 340 public comments. UCSF has published and approved the Vegetation Management Plan to manage the Reserve over the next 20 years. The Vegetation Management Plan addresses the short-term and long-term management of the Reserve to achieve its goals to protect the safety of residents and visitors, improve ecosystem health, regenerate the forest, and maintain and ensure public access to the Reserve.

UCSF will continue to implement the Vegetation Management Plan in good faith, subject to funding availability. UCSF will make good faith efforts to ensure adequate funding for the implementation, and will coordinate with the City's Recreation and Parks Department on management of the Interior Greenbelt. UCSF will invite the City to participate in the community process regarding the Vegetation Management Plan.

IV. COOPERATION BY THE CITY TO IMPLEMENT THE PROJECT

A. General.

1. The City will make good faith, cooperative, and timely efforts to support implementation of those elements of the Project that were analyzed in the Project's Final EIR (inclusive of any mitigations to impacts of the Project according to the Project's Final EIR and MMRP), including participation of and coordination with City agencies and review and consideration of any approvals, permits or easements. This commitment does not require the City to initiate or undertake any projects, programs or expenditures for capital improvements or operational investments other than staff time necessary to review, coordinate, and process elements of implementing the Project and other commitments of the City expressly described in this MOU.

B. Transportation and Mobility Improvements.

1. The City will support transit improvements to the Campus community by encouraging SFMTA to undertake improvements to transit infrastructure serving the Campus. Such improvements should include expansions of the N-Judah Metro light rail line capacity and frequency during times and directions of peak usage by UCSF employees, students, and patients.

2. The City will support targeted improvements at the UCSF N-Judah Metro light rail line stop, as well as improvements to the existing crossover track so that it is west of Carl Street and Hillway Avenue (current location) to provide for a short-run N-Judah train to serve UCSF.

3. The City will support targeted expansions of frequency and reliability of other nearby SFMTA service lines and stops. Specifically, the City will support increased access for

the Aldea San Miguel community, including increased coordination between the SFMTA and UCSF regarding shuttle and SFMTA service schedules.

V. GENERAL PROVISIONS

A. No Waiver of Authority.

1. By entering into this Agreement, the City is in no way modifying or limiting the obligations of UCSF to develop the Project in accordance with all laws applicable to UCSF. Nothing in this Agreement will be construed as a waiver by UCSF of its constitutional status, sovereignty or exemptions available to it as a California constitutional corporation regarding its exemption from compliance with local regulations or other local laws as related to the Project. UCSF meeting its obligations under the MOU is separate and apart from, and cannot be related in any form to its constitutional status.

2. UCSF understands that its construction of the improvements and development of portions of the Project will require certain limited approvals, authorizations and permits from governmental agencies with jurisdiction. UCSF will use good faith efforts to obtain any regulatory approvals required for portions of the Project applicable to UCSF, and the City will cooperate reasonably on processing any such approvals within its jurisdiction.

3. In addition to any rights or obligations as a responsible agency under CEQA, the City retains the right to oppose UCSF projects, including any projects that involve significant and material amendments to the LRDP that, based on substantial evidence, result in new or substantially more severe environmental impacts than described in the 2014 LRDP EIR, the CPHP EIR, and the forthcoming Hospital EIR, as defined by CEQA statutes, guidelines, and standards.

B. Enforcement of MOU; Default; Remedies.

1. Enforcement. As of the date of this MOU, the only Parties to this MOU are the City and UCSF. This MOU is not intended, and will not be construed, to benefit or be enforceable by any other person or entity whatsoever.

2. Meet and Confer Process. Before sending a notice of default in accordance with Section V.B.3 of this Agreement, the Party which may assert that the other Party has failed to perform or fulfill its obligations under this MOU will first attempt to meet and confer with the other Party to discuss the alleged failure and will permit such Party a reasonable period, but not less than ten (10) days, to respond to or cure such alleged failure. The Party asserting such failure will request that such meeting and conference occur within twenty-one (21) days following the request and if, despite the good faith efforts of the requesting Party, such meeting has not occurred within thirty (30) days of such request, then such Party will be deemed to have satisfied the requirements of this Section and may proceed in accordance with the issuance of a notice of default under Section V.B.3 of this Agreement.

3. Default. The following will constitute a "**Default**" under this MOU: the failure to perform or fulfill any material term, provision, obligation, or covenant of this MOU and the continuation of such failure for a period of ninety (90) days following notice and demand for

compliance. Notwithstanding the foregoing, if a failure can be cured but the cure cannot reasonably be completed within ninety (90) days, then it will not be considered a Default if a cure is commenced within said 90-day period and diligently prosecuted to completion thereafter. Any notice of default given by a Party will specify the nature of the alleged failure and, where appropriate, the manner in which said failure satisfactorily may be cured (if at all). If UCSF is in substantive Default regarding performance of the Housing or Transportation Contribution commitments contained in this MOU, pending requests that require action by the City may be tolled until the Default is remedied.

4. Dispute Resolution. The Parties recognize that disputes may arise from time to time regarding the Project and the Parties obligations under this Agreement. Accordingly, before seeking any judicial remedy, the Parties agree to follow the dispute resolution procedure in this Section that is designed to expedite the resolution of such disputes. If, from time to time, a dispute arises between the Parties, the dispute will be presented by City staff and UCSF staff to a joint meeting with the Planning Director and UCSF's Vice Chancellor of Campus Development for resolution.

5. Remedies.

(a) Specific Performance. Subject to, and as limited by, this Section, in the event of a Default, the remedies available to a Party will include demand for specific performance of this MOU and other equitable remedies.

(b) Termination. In the event of a Default, the non-defaulting Party may elect to terminate this MOU by sending a notice of termination to the other Party, which notice of termination will state the Default. Any such termination will be effective upon the date set forth in the notice of termination, which will in no event be earlier than ninety (90) days following delivery of the notice.

(c) No Damages. The Parties have determined that (i) monetary damages are generally inappropriate, (ii) it would be extremely difficult and impractical to fix or determine the actual damages suffered by a Party as a result of a Default hereunder, and (iii) equitable remedies, not including damages but including demands for specific performance and termination, are particularly appropriate remedies for enforcement of this MOU. Consequently, UCSF agrees that the City will not be liable to UCSF for damages under this MOU, and the City agrees that UCSF will not be liable to the City for damages under this MOU, and each expressly waives its right to recover damages under this MOU.

6. Time Limits; Waiver; Remedies Cumulative. Failure by a Party to insist upon the strict or timely performance of any of the provisions of this MOU by the other Party, irrespective of the length of time for which such failure continues, will not constitute a waiver of such Party's right to demand strict compliance by such other Party in the future. No waiver by a Party of any condition or failure of performance, including a Default, will be effective or binding upon such Party unless made in writing by such Party, and no such waiver will be implied from any omission by a Party to take any action with respect to such failure. No express written waiver will affect any other condition, action or inaction, or cover any other period of time, other than any condition, action or inaction and/or period of time specified in such express waiver. One or

more written waivers under any provision of this MOU will not be deemed to be a waiver of any subsequent condition, action or inaction, and the performance of the same or any other term or provision contained in this MOU.

C. Other General Provisions.

1. Miscellaneous. (a) This MOU may be amended or modified only by a writing signed by the Parties. (b) No waiver by any Party of any of the provisions of this MOU will be effective unless in writing and signed by an authorized representative, and only to the extent expressly provided in the written waiver. (c) All approvals and determinations of City requested, required, or permitted under this MOU may be made in the sole and absolute discretion of the Director of Planning or the head of the City department with jurisdiction over the matter. Any request for approvals or consents under this MOU by the staff (as opposed to boards or commissions) of either party will not be unreasonably withheld. (d) This instrument contains the entire agreement between the Parties and all prior written or oral negotiations, discussions, understandings and agreements are merged into this MOU. (e) The section and other headings of this MOU are for convenience of reference only and will be disregarded in the interpretation of this MOU. (f) Time is of the essence. (g) This MOU will be governed by California law. (h) This MOU may be executed in one or more counterparts, all of which taken together will be deemed to be one original.

2. Contingent Obligations. The obligations contained in this MOU will be contingent on UCSF proceeding with the Project as contemplated and securing successful entitlement and requisite approvals to implement the Project. UCSF agrees to satisfy its obligations hereunder, unless UCSF reduces the scope and scale of the Project as contemplated, in which case UCSF will meet its obligations in proportionate manner and at which time the Parties will revisit the commitments, including CEQA review as necessary.

3. Termination. This MOU will terminate upon completion of all projects, phases, and other activities contemplated in the Project or 30 years following approval of the CPHP, whichever occurs first, subject to any provisions which, by their express terms, survive termination or expiration (i.e., the commitment to maintain the affordable housing). Further, if the City files a CEQA lawsuit challenging the Project, including but not limited to the New Hospital, this MOU will be null and void and will be automatically terminated upon service of a petition on the respondent public agency and/or any real party in interest.

4. Environmental Review. To the extent any action contemplated by this MOU requires additional environmental review, notwithstanding anything to the contrary in this MOU, neither Party is in any way limiting their discretion with respect to such action, and agrees to take such action, if at all, only after completing environmental review, as required under CEQA, and considering the impacts disclosed by such review. In addition to any conditions described in this MOU, the obligations of each Party are expressly subject to the receipt of all legally required approvals following environmental review, in compliance with CEQA. Upon request, the Parties agree to meet and confer as needed in order to ensure that all environmental review has been completed or updated, as needed, before a specific action.

5. Notices. All notices sent by one Party to the other will be sent to the following addresses unless a Party notifies the other of a change of address in writing:

If to the City: City and County of San Francisco
Director of Planning
_____
San Francisco, CA 94102
Attn: _____
Phone: 415-_____
e-mail: _____

with copy to: _____
City and County of SF
_____
San Francisco, CA 94102
Email: _____

If to UCSF: University of California, San Francisco
_____
_____
Attn: _____
Phone: _____
e-mail: _____

with copy to: _____
_____
_____
_____
Email: _____

All notices will be either (a) hand delivered, (b) sent via US Postal Service postage prepaid, by certified or registered mail, return receipt requested, or (c) sent by a nationally recognized commercial carrier. Courtesy copies of notices may be sent by e-mail, but official notices must be sent by utilizing a delivery system listed in (a), (b) or (c) above.

6. Force Majeure. In the event that either Party is delayed or hindered in or prevented from the performance of any act required in this MOU by reason of strikes, lock-outs, labor troubles, inability to procure materials, failure of power, governmental moratorium or other governmental action or inaction (including failure, refusal or delay in issuing permits, inspections, approvals and/or authorizations), injunction or court order, riots, insurrection, war, terrorism, bioterrorism, fire, earthquake, flood or other natural disaster or other reason of a like nature beyond the reasonable control of the Party delayed in performing work or doing acts required under the terms of this MOU (collectively, "**Force Majeure Delays**"), then performance of such act will be excused for the period of the delay and the period for the

performance of any such act will be extended for a period equivalent to the period of such delay. Force Majeure Delays include epidemic; pandemic; national, regional or local emergency; quarantine; and governmental order.

[signature page follows]

IN WITNESS WHEREOF, the Parties have executed this MOU on the date set forth below.

City and County of San Francisco, a
municipal corporation, acting by and through its
Planning Department.

By: _____
Name: Rich Hillis, Planning Director
Date: _____

RECOMMENDED:

San Francisco Municipal Transportation Authority

By: _____
Name:
Date: _____

Mayor's Office of Economic and Workforce Development

By: _____
Name:
Date: _____

University of California, San Francisco.

By: _____
Name: _____
Date: _____

University of California
San Francisco

Office of Community & Government Relations

Box 0462
3333 California St., Suite 103
San Francisco, CA 94143

tel: 415.476.3206
fax: 415.476.3541

www.ucsf.edu

January 11, 2021

Land Use & Transportation Committee
San Francisco Board of Supervisors
1 Dr. Carlton B. Goodlett Place
San Francisco, CA 94102

Chair Peskin and Members of the Land Use & Transportation Committee,

Over the last two years, UCSF has worked with thousands of community members to develop a bold 30-year vision for our original campus at Parnassus Heights called the Comprehensive Parnassus Heights Plan (CPHP).

UCSF plans to update our campus to support our care delivery, research, education, and public service missions. Together with accompanying community investments, the plan envisions a future Parnassus Heights campus and hospital that not only supports UCSF's students, patients, faculty and staff, but also improves the daily experience of our neighbors and addresses local challenges facing our city.

The CPHP will create a new hospital that meets the 2030 seismic safety guidelines required by state law, as well as expand inpatient care capacity by 200 beds in order to meet growing regional demand for UCSF's specialty care. The plan will also update aging labs and classrooms that currently have an average age of 50 years old, in order to continue to attract and train the world class faculty and students that make UCSF one of the nation's leading academic medical centers.

Community Outreach

Beginning in July 2018, UCSF worked closely with neighbors, community leaders, elected officials, and city partners on a two year process to develop ideas for community investments. This process included:

- 28 community meetings
- 71 meetings with local, state, and federal elected officials
- 2,400 community surveys collected
- Regular updates to a 1,200 member listserv
- A total of 10,000 neighbors actively engaged

As a result of this process, the community identified 25 specific investment ideas that aim to benefit the local neighborhood and address potential impacts of the CPHP.

Memorandum of Understanding

Over the last several months, UCSF has worked closely with the City and County of San Francisco to develop a Memorandum of Understanding (MOU) that refines and aligns the opportunities where UCSF and the City will collaborate on community investments to accompany the CPHP.

The MOU includes UCSF investments in:

- **Housing**: 1,263 net new housing units, 40% of all new and existing units are available to households earning up to 120% of AMI, and half of those to household earning up to 90% of AMI.

- **Transportation**: $20 million to SFMTA to improve transit to Parnassus Heights, including increased capacity on the N-Judah, as well as streetscape improvements to make streets safer, better lit, and more beautiful.

- **Open Space:** UCSF will maintain its Mt. Sutro Open Space Reserve at no less than its current size of 61 acres, while improving wayfinding as part of our "park to peak" vision between the Reserve and Golden Gate Park.

- **Community Workforce and Equity:** A revitalized campus will bolster the economic strength of the community as we recover from COVID-19, creating thousands of new construction jobs and permanent positions over the life of the project. UCSF has committed to a 30 percent local hire goal for project construction jobs, through our existing partnership with the CityBuild program. UCSF will also expand its EXCEL workforce training program, in partnership with the City's JobsNow! program to provide more opportunities for entry-level administrative jobs in health care for City residents. We commit to expand these existing programs by a combined $5 million over the next 10 years. Finally, UCSF commits to leverage its commitment as an Anchor Institution to advance economic security and opportunity in under-resourced communities to improve health equity, including increasing spending with small, local and diverse businesses by at least 50% by 2024.

- **Equity and Educational Opportunities:** UCSF will strengthen its existing partnerships with SFUSD – such as the Science Education Partnership and Center for Science Education and Outreach – to support STEM curriculum, internship opportunities, pipeline programs and providing increased exposure to career opportunities in health care and mental health care professions for underrepresented and minority youth.

- **Behavioral Health:** To support the City's mental health care needs, UCSF will continue to maintain inpatient psychiatric beds at UCSF facilities throughout the City, as well as at Zuckerberg San Francisco General Hospital. We will also explore partnerships and collaborations to: increase the number of adult inpatient psychiatric beds for Medi-Cal patients; provide mental health care services; and continue collaborations with the Department of Public Health.

Community investments in the MOU go beyond CEQA mitigation measures, which will be addressed in the Final Environmental Impact Report. We thank the City family for their time and

feedback, and commitment to making sure UCSF's community investments align with the City's priorities and community feedback.

Community Support

We are proud to have received support letters for the plans for Parnassus Heights from over 20 community organizations, including SPUR, San Francisco Bicycle Coalition, Inner Sunset Park Neighborhood Association Board of Directors, Westside Transportation and Accessibility Coalition, Bay Area Council, San Francisco Housing Action Coalition, local Chambers of Commerce, and elected officials, such as Congresswoman Jackie Speier, State Senator Scott Wiener, and Assemblymembers Phil Ting, David Chiu, Kevin Mullin, and Marc Levine. These letters are enclosed and addressed to the UC Board of Regents, who will vote to approve the plan to revitalize our Parnassus Heights campus in January.

We are also honored to have received hundreds of support letters from San Francisco residents and hundreds more who have signed a petition in support of the plans for Parnassus.

The CPHP is the roadmap to modernize our labs and classrooms and build a new hospital to serve our community with enough beds to accommodate current and future patient demand. The MOU is our commitment to San Francisco to create a more welcoming environment for the community with pathways to Mount Sutro, enhance onsite amenities and services, generate local jobs and stimulate the economy during a pivotal time for the future of our city.

Parnassus Heights is more than where we work, study and provide care. It's the neighborhood where UCSF was born more than a century ago, and where many of us live today. We look forward to our continued work together to support new housing and transit solutions that will help us address everyday challenges facing our shared neighborhood.

Thank you for your leadership in our community and partnership with UCSF. UCSF remains committed to continuing engagement on future projects, such as with the New Hospital design process that is anticipated to begin in early 2021. We look forward to our continued collaboration.

In partnership,



Francesca Vega
Vice Chancellor, UCSF Community & Government Relations

HOUSE OF REPRESENTATIVES
WASHINGTON, D.C. 20515

JACKIE SPEIER
CALIFORNIA

October 27, 2020

The Honorable John Perez, Chair
University of California, Board of Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607

Dear Chair Perez:

I write to respectfully express my support for the University of California San Francisco (UCSF) Comprehensive Parnassus Heights Plan. It is my understanding that the university has worked with neighbors over the past two years to address concerns. I hope that these conversations continue.

When I served in the state legislature, I was the author of legislation that extended the deadline for seismic retrofitting of our hospitals that agreed to take proper interim measures to ensure safety. UCSF Parnassus was a campus identified at the time as in need of replacement. Decades later, the comprehensive plan before you will finally enable this to happen. UCSF patients and personnel will obviously benefit.

In addition, it is my understanding that the university intends to construct housing on the site in order to provide for UCSF personnel. As the Regents are aware, housing for university personnel in the Bay Area is scarce and providing units on campus will help reduce traffic and aid in the university's recruitment efforts.

The university's research continues to lead the world in finding new solutions to our nation's most pressing medical challenges, including of late COVID-19. The university system must reconstruct and change its campuses to meet these evolving needs.

Many years ago, no one entirely saw the transformative impact upon medical research that the campus in Mission Bay would have. However, those few who tried, and who lent their support to Mission Bay, provided the crucial foundations for the medical miracles that we all enjoy today.

Knowing your longtime leadership in the state, I know you will review this plan by taking a multi-generational approach. We all recognize that no one can clearly see all of the benefits of a transformed campus, but everyone in the future will clearly benefit from the discoveries and care that will emerge from a new Parnassus campus. Approving this plan will be a demonstration of the university's motto, Fiat Lux. I respectfully suggest that now is the moment to rise to that hopeful mandate.

All the best,

Jackie Speier

KJS/bp

NOT PRINTED OR MAILED AT GOVERNMENT EXPENSE

STATE CAPITOL
P.O. BOX 942849
SACRAMENTO, CA 94249-0115

California Legislature

January 4, 2021

The Honorable John Pérez, Chair
University of California, Board of Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607

Dear Chair Pérez,

As legislators representing the City and County of San Francisco, San Mateo, Marin and Sonoma Counties, we are pleased to offer our support for UCSF's Comprehensive Parnassus Heights Plan (CPHP). For more than a century, UCSF at Parnassus Heights has been the birthplace of world-class research, a top-ranked training ground for health care professionals and scientists, and the destination for complex care that only UCSF can provide.

The shared history of the Bay Area and UCSF spans more than a century of partnership in ensuring the health of our community. From the 1906 earthquake to the HIV epidemic to COVID-19, UCSF has served the health care needs of Northern California's diverse communities during public health care crises and every year in between.

To keep pace with the Bay Area's and California's growing health care needs, UCSF is making plans to replace and renovate some of its outdated and seismically vulnerable buildings. State-of-the-art facilities will strengthen UCSF's renowned research and training programs. Due to the COVID-19 pandemic, every Californian understands the importance of this research and training at UCSF.

The project also includes a modern hospital with more capacity so that the UCSF Helen Diller Medical Center at Parnassus Heights no longer has to turn away patients because it does not have enough beds. UCSF states it will have to turn away 3,000 patients this year alone. With the Bay Area and California's population projected to grow over the next decade – including among the elderly, who typically require specialized care – it is essential for UCSF to build a modern hospital to address this critical capacity shortage.

The Parnassus Campus is located in the heart of San Francisco. With this in mind, the collaborative work that UCSF has done with the community and the city to address the impact of the development in the neighborhood pleases us. Most importantly, we understand that UCSF is working with city and community leaders to address the potential challenges of a redeveloped campus. UCSF is planning over 1,000 units of new housing and commits itself to exploring with the city ways to ease traffic through enhancements to transit and employee work-at-home solutions to lower the on-campus population.

We are proud to represent UCSF and nearby communities in the Legislature, and support their efforts through the Comprehensive Parnassus Heights Plan to maintain their position as the leading university dedicated exclusively to the health sciences.

Sincerely,

Philip Y. Ting
Assemblymember, 19th District

Scott Wiener
Senator, 11th District

David Chiu
Assemblymember, 17th District

Kevin Mullin
Assemblymember, 22nd Assembly District

Marc Levine
Assemblymember, 10th District

INNER SUNSET PARK NEIGHBORS

November 5, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607

Dear University of California Board of Regents,

The Board of Directors of the Inner Sunset Park Neighbors (ISPN) writes in support of the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

UCSF is a valued contributor within San Francisco's economic and social landscape. As a top job creator and the second largest employer in the City and County, UCSF contributes to San Francisco's energy and "innovation ecosystem," attracting world-class talent to live, work, and study; many of whom choose to live in our beloved neighborhood- the Inner Sunset. The CPHP will bring much-needed improvements to the Parnassus Heights campus, allowing UCSF to continue being a major economic driver in the Inner Sunset.

Over the past two years, ISPN board members have been engaged in developing the CPHP through the thoughtful process UCSF created to embed neighbor voice in the plan. Members of our organization were engaged from the beginning as part of the Parnassus Heights Community Working Group to create a plan that opens the campus to the neighborhood. ISPN members also participated in the Advisory Committee on the Future of Parnassus Heights to identify potential improvements to help further neighborhood goals for the Parnassus Heights campus. UCSF was responsive and eager to hear our input.

With the input of organizations like the ISPN, a variety of community investments were identified in the areas of open space, mobility, and housing. ISPN is encouraged by UCSF's collaboration with the City and County of San Francisco to develop a MOU and discuss the feasibility of these ideas that range from building more housing, increasing capacity of Muni lines that serve our neighborhood, and connecting Golden Gate Park and Mount Sutro through our neighborhood streets.

On behalf of the Inner Sunset Park Neighbors, we urge you to support UCSF's Comprehensive Parnassus Heights Plan as they are a valued neighbor. The ISPN looks forward to continuing to work with UCSF to bring these community investments to fruition and ensure neighbor voice continues to be part of the process.

Sincerely,

Martha D. Ehrenfeld

Martha Ehrenfeld
President, Inner Sunset Park Neighbors

SPUR
San Francisco | San Jose | Oakland

July 10, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin St.,12th floor
Oakland, CA 94607
via email to regentsoffice@ucop.edu

RE: SPUR Endorsement of UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents:

UCSF presented its Comprehensive Parnassus Heights Plan Vision to SPUR's Project Review Advisory Board at our June 30, 2020 meeting for review and consideration. **The SPUR Project Review Advisory Board finds this plan to be an appropriate set of uses for this location and endorses UCSF's concept as presented at this time, recognizing that project design and some policy details are not yet solidified.**

SPUR is generally focused on policies, plans and codes rather than on individual projects. In order to support well-designed, high-quality infill development, we prefer to help set good rules around zoning, fees, housing affordability, sustainability, etc. However, on occasion, our Project Review Advisory Board will review and endorse development proposals of citywide or regional importance, such as the UCSF Comprehensive Parnassus Heights Plan, evaluating their potential to enhance the vitality of the city and region according to the policy priorities and principles of good placemaking supported by SPUR.

Located south of Golden Gate Park and north of Mount Sutro, between the Cole Valley and Inner Sunset neighborhoods, the Parnassus Heights Campus is a 107-acre site (including 61 acres of Mount Sutro Open Space Reserve). Driven by UCSF's need to modernize UCSF's medical and research facilities and meet the state's 2030 Hospital Seismic Safety requirements, the Comprehensive Plan proposes to increase the site's capacity by 2.04 million gross square feet, bringing the campus to 5.96 million square feet at full build-out. The plan will add 762 net new units of faculty and student/trainee housing, bringing the total to 984 units.

The Comprehensive Plan lays out master plan-level guidance for the overall physical environment at Parnassus Heights. While it does not include specific architectural designs for individual buildings or projects, it does include design guidelines and outlines the configuration of buildings and open space areas as well as the major types of uses within them (such as inpatient, outpatient, research, instruction, support, housing, and parking), with special attention paid to the adjacency of uses especially at the intersection of clinical, research and instruction uses.

SPUR affirms that the Comprehensive Parnassus Heights Plan:

- ✓ **Is located at an appropriate location for development**, near transit and infrastructure and not on a greenfield site. The Parnassus Heights campus is located in an infill location, on the N Judah Muni line and near other frequent transit options such as buses and University-run shuttles.
- ✓ **Provides an appropriate mix of land uses** including medical, research, clinical, educational, residential and open space uses. The plan contributes to the diversity of the city's housing stock, fosters economic development and provides critical amenities and services to the surrounding community. This complex plan replaces an aging hospital, research facilities and infrastructure, and it incorporates an additional 762 units of much-needed faculty and student housing into the overall campus.
- ✓ **Provides sufficient density at the site** without expanding the existing campus boundaries, supporting a key medical institution in San Francisco and preventing underutilization of land, serving the future needs of Bay Area residents.
- ✓ **Creates a good place for people and contributes to a walkable environment** with conceptual proposed changes to the campus plan, including improvements to the Irving Street entry, a "main street" pedestrian focus and streetscape improvements on Parnassus Avenue, the restoration of Fourth Avenue to the city grid and the "Park to Peak" connections through campus that further open up Mount Sutro Open Space Reserve to the public. We also appreciate that the plan reduces the amount of parking by 380 spaces from the existing number.

The SPUR Project Review Advisory Board finds this plan to set out an appropriate set of land uses for this location and endorses the concepts proposed in the Comprehensive Parnassus Heights Plan. We understand the need to replace and renovate the medical, clinical and research facilities to avoid obsolescence, meet seismic code upgrade requirements and

maintain Heights' stature as a world-class medical and research hub. support UCSF's use planning, including density, at this infill location, and we appreciate the efforts to engage the With that in is crucial that robust transit and public realm improvements be paired with these changes. We would also support any additional housing that could be added, which serves a dual role as a transportation demand management measure. Lastly, we are excited about the "Park to Peak" concept, which could be a character-defining feature for the community, and we encourage the university to comprehensively build out those physical connections. Recognizing that this is an early stage of planning, we look forward to final commitments around public realm concepts and other community benefits. We are encouraged by the design team selection this week and look forward to future designs of the buildings proposed in the plan.

Please do not hesitate to contact us or Kristy Wang, SPUR's Community Planning Policy Director, with any questions or clarifications.

Sincerely,

Charmaine Curtis Diane Filippi
Co-Chairs, SPUR Project Review Advisory Board

cc: SPUR Board of Directors

June 3, 2020

SENT VIA EMAIL

San Francisco Planning Commission
1650 Mission Street, 4th Floor, Suite 400
San Francisco, CA, 94103

RE: UCSF Comprehensive Parnassus Heights Plan

Dear President Koppel and Planning Commissioners,

California is experiencing an unprecedented housing shortage that, without significant intervention, will devastate our cities and communities. The California Department of Housing and Community Development estimates that the state needs to build 180,000 new units of housing annually by 2025 to meet projected population growth - over 100,000 more units than our current pace. According to Next 10's *Missing the Mark: Examining the Shortcomings of California's Housing Goals*, San Francisco is far behind in most of their RHNA (Regional Housing Needs Allocation) targets. In fact, the report estimates the County will not meet its very low income target until 2030, low income until 2025, and moderate income levels until 2045. This shortage is degrading the quality of life for all of San Francisco, pushing out long-time residents and future generations alike.

The UCSF Comprehensive Parnassus Heights Plan includes a densification and expansion of housing opportunities on campus, more than quadrupling the number of units that currently exists. This plan will create new on-campus housing opportunities for students, trainees, faculty, and staff. As you are aware, there is a significant need for additional housing in San Francisco, especially for students and the workforce. For this and the following reasons, the Bay Area Council strongly supports this proposed project:

- **New On-Campus Housing for Students and Trainees** – This project will increase the amount of housing on site by over 4x and provide housing for students, medical trainees, faculty and workforce housing. The on-campus housing opportunities will allow residents to walk to their daily activities on campus. This project demonstrates that locating housing near jobs can alleviate traffic with new housing, rather than exacerbate it. The housing densification project is a priority and will occur in first 10 years of the project as part of the Initial Phase.

P 415.946.8777
F 415.981.6408
353 Sacramento Street, 10th Floor
San Francisco, California 94111
1215 K Street, Suite 2220
Sacramento, California 95814

- **Transit Accessibility & Alternative Transportation** – Over half of those arriving to UCSF Parnassus arrive by transit or bicycle. The campus is directly connected to the SFMTA transit system via the N Judah light rail line which runs by the Irving Street entrance. Improvements to the Irving Street entrance will further encourage use of public transit, improve the arrival experience, and create a welcoming campus to visitors, patients and the public. The plan includes a mobility component to promote and support alternative transportation strategies and provide pedestrian safety improvements.

- **Robust Community Engagement and Community Benefits –** Community engagement efforts for this project have been ongoing since the fall of 2018. The process began with a community working group in which the neighborhood was engaged in a re-envisioning process to inform the plan. Over 1,000 survey responses with community member concerns and feedback were considered. The ongoing effort has included focused discussions on the public realm, connectivity to nature, mobility, and housing. A wide range of community benefits have been incorporated into the plan in order to offset impacts to the existing community, including a new network of public open spaces, improved streetscapes, and publicly-accessible connections between Golden Gate Park and Mount Sutro.

- **New Hospital at Parnassus** – A new hospital will increase patient capacity to keep pace with demand and provide additional space for research, academic, support, and clinical uses. The new hospital will address issues with overcrowding, seismic compliance, and functional obsolescence that the aging Moffit Hospital currently faces.

The UCSF Comprehensive Parnassus Heights Plan improves upon the existing condition of the campus by drastically increasing the amount of housing on-site, expanding medical and research capacity with new state-of-the-art facilities, and improving the public realm for the community. On behalf of the Bay Area Council, we urge you to support this project.

Sincerely,

Matt Regan

Matt Regan
Senior Vice President
Bay Area Council

P 415.946.8777
F 415.981.6408
353 Sacramento Street, 10th Floor
San Francisco, California 94111
1215 K Street, Suite 2220
Sacramento, California 95814

December 18, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street
12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: UCSF's Comprehensive Parnassus Heights Plan- Hispanic Chamber of Commerce

Dear University of California Board of Regents,

I write to you to convey Mission Hiring Hall's enthusiastic support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

UCSF is a powerful contributor within San Francisco's economic and social landscape. As a top job creator and the second largest employer in the City and County, UCSF contributes to San Francisco's energy and "innovation ecosystem," attracting world-class talent to live, work, and study.

As San Francisco recovers from the economic toll of COVID-19, UCSF's thirty-year plan will be a key economic driver in rebuilding our workforce. New jobs will be created over the course of redeveloping the Parnassus Heights campus, including an estimated 1,200-1,400 labor jobs through construction of the new, state-of-the-art hospital and the same amount of permanent positions once the hospital opens.

This CPHP envisions a reinvigorated Parnassus Heights campus that both strengthens the neighborhood's economic and cultural vitality and allows UCSF to deliver world-class health care and research to San Francisco, the Bay Area, and the global community for decades to come.

On behalf of Mission Hiring Hall, I urge you to support the Comprehensive Parnassus Heights Plan.

Sincerely,

Michelle Leonard-Bell
General Manager
Email: mleonardbell@missionhiringhall.org

Charity Cultural Services Center
博愛文化服務中心
731 Commercial Street, San Francisco CA 94108
Tel: (415) 989-8224 • Fax: (415) 391-0525
Email: info@sfccsc.org • Web: http://sfccsc.org

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street
12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

November 16, 2020

Re: UCSF's Comprehensive Parnassus Heights Plan- Hispanic Chamber of Commerce

Dear University of California Board of Regents,

I write to you to convey Charity Cultural Services Center's enthusiastic support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

UCSF is a powerful contributor within San Francisco's economic and social landscape. As a top job creator and the second largest employer in the City and County, UCSF contributes to San Francisco's energy and "innovation ecosystem," attracting world-class talent to live, work, and study.

As San Francisco recovers from the economic toll of COVID-19, UCSF's thirty-year plan will be a key economic driver in rebuilding our workforce. New jobs will be created over the course of redeveloping the Parnassus Heights campus, including an estimated 1,200-1,400 labor jobs through construction of the new, state-of-the-art hospital and the same amount of permanent positions once the hospital opens.

This CPHP envisions a reinvigorated Parnassus Heights campus that both strengthens the neighborhood's economic and cultural vitality and allows UCSF to deliver world-class health care and research to San Francisco, the Bay Area, and the global community for decades to come.

On behalf of Charity Cultural Services Center-San Francisco, I urge you to support the Comprehensive Parnassus Heights Plan.

Sincerely,

Ashley Cheng
Executive Director

Coalition to Grow San Francisco
San Francisco, CA

December 28, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

RE: Support for UCSF's Comprehensive Parnassus Heights Plan from Grow SF

Dear University of California Board of Regents,

Grow SF envisions a San Francisco that is inclusive, livable, sustainable, and affordable for all families. We want healthy transportation systems, more housing, and smart growth to happen in partnership with organizations and their employees who are committed to San Francisco.

That is why we wholeheartedly support UCSF's Comprehensive Parnassus Heights Plan (CPHP) and their inclusive community engagement process that resulted in identifying neighbor-driven priorities for community investments such mobility and housing. UCSF is a valued contributor within San Francisco's economic and social landscape. As a top job creator and the second largest employer in the City and County, UCSF attracts and maintains world-class talent to live, work, and study in San Francisco; many of whom choose to live in the surrounding neighborhood. The CPHP will bring much-needed improvements to the Parnassus Heights campus, allowing UCSF to continue being a major economic driver in the city.

San Francisco has not been able to build enough housing for decades. This has led to skyrocketing rents, increasing homelessness, and reduced economic opportunity as rent eats up an ever-growing amount of everyone's paycheck. We support making it easier to build homes at all price points to reduce rent and displacement pressures, once again making San Francisco a city where renters and first-time homeowners can thrive. San Francisco's transit network could be one of the best in the country, but unfortunately gets caught in the same traffic as cars, reducing reliability, service, and efficiency. We support making San Francisco a truly transit-first city with more bus lanes, bike infrastructure, and Muni/BART investments that make it easier for everyone to get around. Climate Change is real, and automobiles are the number one source of carbon emissions in the state. We support building more housing in urbanized coastal areas with temperate weather and strong public transit to reduce VMT.

The UCSF Parnassus Heights campus plan would bring a world class hospital and research facility to the immediate neighborhood and beyond. It would also create over 1,000 new housing units, thousands of jobs, additional bike infrastructure, and direct millions of dollars to San Francisco's transit system. COVID-19 has taken a massive toll on our great city. People are out of work, our public transportation systems have a huge deficit, and our hospital beds are filling up. This project is exactly what we need for San Francisco to come back from the pandemic even stronger.

We are encouraged by UCSF's collaboration with the City and County of San Francisco to develop a Memorandum of Understanding and discuss the feasibility of community ideas that range from constructing more housing, increasing capacity of Muni to serve our neighborhood, and connecting Golden Gate Park and Mount Sutro through our neighborhood streets.

On behalf of the GrowSF, we urge you to support UCSF's Comprehensive Parnassus Heights Plan as a valued contributor to creating a better future for San Francisco.

Sincerely,



Sachin Agarwal
Founder, Grow SF

235 Montgomery St., Ste. 760, San Francisco, CA 94104
tel: 415.392.4520 • fax: 415.392.0485
sfchamber.com • twitter: @sf_chamber

June 3, 2020

President Koppel and San Francisco Planning Commission
San Francisco City Hall
1 Dr. Carlton B. Goodlett Place
San Francisco, CA

Re: UCSF Comprehensive Parnassus Heights Plan

Dear President Koppel and Members of the San Francisco Planning Commission,

On behalf of the San Francisco Chamber of Commerce, I am pleased to **support the UCSF Comprehensive Parnassus Heights Plan.** As San Francisco recovers from the COVID-19 pandemic and re-opens its economy, this 30-year project will be a key economic driver for the City, adding jobs in health care and construction and increasing economic activity citywide.

UCSF plays an essential role in San Francisco, as a top-ranked medical center, University of California health sciences campus, and major biotechnology research center. UCSF is also the second-largest employer in San Francisco, after the City itself, and half of its employees are San Francisco residents.

UCSF's aging facilities have not kept pace with the University's renowned status nationwide. Its flagship Moffitt Hospital was designed in the 1940s and opened in the 1950s, and is now unable to meet the growing demand for patient referrals and modern standards of care. Its aging research labs make it more difficult for UCSF to recruit and retain the world-class faculty and students that make UCSF a world-class university and medical center, and which UCSF needs in order to lead cutting edge research to fight diseases like COVID-19.

Over the last two years, UCSF has engaged in an open and transparent process with its neighbors regarding the plan. The Chamber is excited about the benefits that this plan will provide to the City, including: jobs, new housing, transportation enhancements, and improved access to open space.

The Chamber looks forward to implementation of UCSF's Comprehensive Parnassus Heights plan, and urges your support.

Respectfully,

Jay Cheng
Public Policy Director
San Francisco Chamber of Commerce

SAN FRANCISCO AFRICAN AMERICAN CHAMBER OF COMMERCE

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San Francisco International Airport

November 9, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: UCSF's Comprehensive Parnassus Heights Plan- San Francisco African American Chamber of Commerce

Dear University of California Board of Regents,

I write to you to convey the San Francisco African American Chamber of Commerce's enthusiastic support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

UCSF is a powerful contributor within San Francisco's economic and social landscape. As a top job creator and the second largest employer in the City and County, UCSF contributes to San Francisco's energy and "innovation ecosystem," attracting world-class talent to live, work, and study.

As San Francisco recovers from the economic toll of COVID-19, UCSF's thirty-year plan will be a key economic driver in rebuilding our workforce. New jobs will be created over the course of redeveloping the Parnassus Heights campus, including an estimated 1,200-1,400 labor jobs through construction of the new, state-of-the-art hospital and the same amount of permanent positions once the hospital opens.

The CPHP envisions a reinvigorated Parnassus Heights campus that both strengthens the neighborhood's economic and cultural vitality and allows UCSF to deliver world-class health care and research to San Francisco, the Bay Area, and the global community for decades to come.

The San Francisco African American Chamber of Commerce looks forward to collaborating with UCSF on this transformative effort. On behalf of the San Francisco African American Chamber of Commerce, I urge you to support the Comprehensive Parnassus Heights Plan.

Sincerely,

Frederick Jordan
Frederick Jordan (Nov 12, 2020 15:24 PST)

Frederick Jordan, Chairman
San Francisco African American Chamber of Commerce

1485 Bayshore Boulevard, Suite 427 ◊ Mailing: Box 158 ◊ San Francisco, CA 94124 ◊ Phone: 415-749-6400 ◊ www.sfaacc.org
Office E-mail: admin@sfaacc.org

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BACACC Bay Area Central American Chamber of Commerce

SAN FRANCISCO HCCSF
Hispanic Chambers of Commerce of San Francisco
Cámaras de Comercio Hispanas de San Francisco

NICARAGUAN AMERICAN CHAMBER OF COMMERCE NORTHERN CALIFORNIA

September 24, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street
12th Floor, Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: UCSF's Comprehensive Parnassus Heights Plan- Hispanic Chambers of Commerce

Dear University of California Board of Regents,

I write to you to convey the Board of Directors of the Hispanic Chambers of Commerce of San Francisco's enthusiastic support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

UCSF is a powerful contributor within San Francisco's economic and social landscape. As a top job creator and the second largest employer in the City and County, UCSF contributes to San Francisco's energy and "innovation ecosystem," attracting world-class talent to live, work, and study.

As San Francisco recovers from the economic toll of COVID-19, UCSF's thirty-year plan will be a key economic driver in rebuilding our workforce. New jobs will be created over the course of redeveloping the Parnassus Heights campus, including an estimated 1,200-1,400 labor jobs through construction of the new, state-of-the-art hospital and the same number of permanent positions once the hospital opens.

The CPHP envisions a reinvigorated Parnassus Heights campus that both strengthens the neighborhood's economic and cultural vitality and allows UCSF to deliver world-class health care and research to San Francisco, the Bay Area, and the global community for decades to come.

On behalf of the Hispanic Chamber of Commerce of San Francisco, we urge you to support the Comprehensive Parnassus Heights Plan.

Sincerely yours;

Carlos Solórzano-Cuadra
CEO
Hispanic Chambers of Commerce
Of San Francisco (HCCSF)
Office: 415.735.6120
E mail: carlos@hccsf.com

CHINESE CHAMBER OF COMMERCE

730 Sacramento Street, San Francisco, CA 94108

(415) 982-3000
Fax: (415) 982-4720

September 20, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents 1111 Franklin St.,12th floor
Oakland, CA 94607
via email to regentsoffice@ucop.edu

Re: Chinese Chamber of Commerce Endorsement of UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents:

On behalf of the San Francisco Chinese Chamber of Commerce, I am pleased to **support the UCSF Comprehensive Parnassus Heights Plan.** As San Francisco recovers from the COVID-19 pandemic and re-opens its economy, this 30-year project will be a key economic driver for the City, adding jobs in health care and construction and increasing economic activity citywide.

UCSF plays an essential role in San Francisco, as a top-ranked medical center, University of California health sciences campus, and major biotechnology research center. UCSF is also the second-largest employer in San Francisco, after the City itself, and half of its employees are San Francisco residents.

UCSF's aging facilities have not kept pace with the University's renowned status nationwide. Its flagship Moffitt Hospital was designed in the 1940s and opened in the 1950s, and is now unable to meet the growing demand for patient referrals and modern standards of care. Its aging research labs make it more difficult for UCSF to recruit and retain the world-class faculty and students that make UCSF a world-class university and medical center, and which UCSF needs in order to lead cutting edge research to fight diseases like COVID-19.

Over the last two years, UCSF has engaged in an open and transparent process with its neighbors regarding the plan. The Chinese Chamber is excited about the benefits that this plan will provide to the City, including: jobs, new housing, transportation enhancements, and improved access to open space.

The Chinese Chamber looks forward to implementation of UCSF's Comprehensive Parnassus Heights plan, and urges your support.

Respectfully,

Eddie Au, President
San Francisco Chinese Chamber of Commerce

San Francisco Filipino American Chamber of Commerce

www.sffilamchamber.org

October 1, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: UCSF's Comprehensive Parnassus Heights Plan- San Francisco Filipino American Chamber of Commerce

Dear University of California Board of Regents,

I write to you to convey the San Francisco Filipino American Chamber of Commerce's enthusiastic support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

UCSF is a powerful contributor within San Francisco's economic and social landscape. As a top job creator and the second largest employer in the City and County, UCSF contributes to San Francisco's energy and "innovation ecosystem," attracting world-class talent to live, work, and study.

As San Francisco recovers from the economic toll of COVID-19, UCSF's thirty-year plan will be a key economic driver in rebuilding our workforce. New jobs will be created over the course of redeveloping the Parnassus Heights campus, including an estimated 1,200-1,400 labor jobs through construction of the new, state-of-the-art hospital and the same amount of permanent positions once the hospital opens.

The CPHP envisions a reinvigorated Parnassus Heights campus that both, strengthens the neighborhood's economic and cultural vitality through enhanced retail and amenities, and allows UCSF to deliver world-class health care and research to San Francisco, the Bay Area, and the global community for decades to come.

The San Francisco Filipino American Chamber of Commerce looks forward to collaborating with UCSF on this transformative effort. On behalf of the San Francisco Filipino American Chamber of Commerce, I urge you to support the Comprehensive Parnassus Heights Plan.

Sincerely,

Jose Pecho President
San Francisco Filipino American
Chamber of Commerce
jose@sffilamchamber.org

November 16, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: SF Bike Coalition Support for UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents,

On behalf of the San Francisco Bicycle Coalition, I am writing to express strong support for the Comprehensive Parnassus Heights Plan (CPHP) at the University of California, San Francisco (UCSF).

UCSF's flagship campus was established at Parnassus Heights over 150 years ago and is in critical need of revitalization. As the COVID-19 pandemic has shown, we need to invest in our local hospitals, specifically their need for additional beds and technological improvements to serve increased patient demand. We've also seen how we need to critically reevaluate the ways we navigate our dense, urban areas and create a shift in modality away from single-occupancy vehicles.

The CPHP envisions a Parnassus Heights campus with improved medical and research facilities, including building a new hospital to meet state seismic requirements, while strengthening neighborhood mobility through critical transportation and safety improvements. In particular, we are enthusiastic about the opportunity to improve the bicycle network between Golden Gate Park and the Parnassus Heights campus to serve all bicyclists in the neighborhood.

UCSF engaged in a thoughtful, two-year, collaborative process with neighbors to develop a list of proposed community investments to be made throughout the life of the plan. Their proposed mobility investments include expanding bicycle routes to and through the campus, working with the City to increase capacity and reliability of Muni lines serving the Parnassus Heights campus, and connecting Golden Gate Park and Mount Sutro with greater access paths, all of which will lead to a safer and more livable community for the surrounding neighbors and staff. We look forward to further collaborating on these investments alongside UCSF staff.

I strongly urge you to support UCSF's plans to revitalize their campus, making it a safer place to live, bike, work, and walk. We look forward to partnering with UCSF in implementation of the CPHP.

Sincerely,
Kristen Leckie
Senior Community Organizer
San Francisco Bicycle Coalition

San Francisco
HOUSING
ACTION
COALITION

95 Brady Street
San Francisco, CA 94103
415 541 9001
info@sfhac.org
www.sfhac.org

December 14, 2020
University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin St.,12th floor
Oakland, CA 94607

via email to regentsoffice@ucop.edu

RE: San Francisco Housing Action Coalition Endorsement of UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents:

On November 13, 2020 UCSF presented its Comprehensive Parnassus Heights Plan to the Regulatory Committee of the San Francisco Housing Action Coalition (SFHAC) for review and consideration. **SFHAC is proud to endorse UCSF's Comprehensive Parnassus Heights Plan (CPHP).**

SFHAC is a member-supported nonprofit that advocates for building new well-designed, well-located housing at all levels of affordability. For over 20 years, SFHAC's alliance of businesses, organizations, and individuals have been working together to support smart housing policy, transit-oriented development, and creative solutions for the diverse housing needs of San Francisco's current and future residents. We were founded on the conviction that together we can build the city and neighborhoods we all imagine.

SFHAC supports UCSF's vision to utilize their Parnassus Heights Campus plan as an opportunity to make much-needed improvements to both the surrounding neighborhoods and the city as a whole through housing, transit, open space, and workforce development. Driven by UCSF's need to modernize its medical and research facilities and meet the state's 2030 Hospital Seismic Safety requirements, the CPHP proposes to increase the site's capacity by 2.04 million gross square feet, bringing the campus to 5.96 million square feet at full build-out.

We understand the need to replace and renovate the medical, clinical, and research facilities to avoid obsolescence, meet seismic code upgrade requirements, and maintain

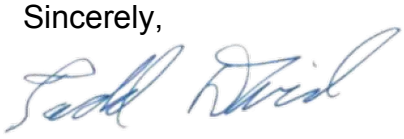
Parnassus Heights' stature as a world-class medical and research hub. SFHAC affirms that the Comprehensive Parnassus Heights Plan:

- **Is situated at an appropriate location for development**, near transit and infrastructure. The Parnassus Heights campus is located on the N Judah Muni line and near other frequent transit options such as buses and University-run shuttles. The Parnassus Heights neighborhood is where UCSF was created more than 120 years ago and where many UCSF employees and students live today.
- **Utilizes smart urban planning to minimize the impact of CPHP development** on the community, particularly in the areas of the new hospital's design, transportation, housing, and construction. We appreciate UCSF and the City's shared commitment to addressing potential challenges by increasing on-campus housing options, mitigating traffic, and exploring ways to lower the on-campus population such as through employee work-from-home solutions. UCSF has shared that they already have the lowest drive-alone rate of any UC campus.
- **Addresses critical healthcare needs** by building a new hospital. UCSF's Moffitt Hospital was built in 1955. Technology and space usage has changed significantly since that time. A new hospital at the Langley Porter Psychiatric Institute site will update the aging infrastructure while also increasing patient capacity by bringing the total number of beds to 675 to meet the growing demand in San Francisco. The new hospital will also feature private patient rooms which are vital for infection control.
- **Is responsive to housing demand in San Francisco** by providing an additional 762 net new units of faculty, student/trainee, and workforce housing, and bringing a total 1,263 net new units. The plan contributes to the diversity of the city's housing stock, fosters economic development, and provides critical amenities and services to the surrounding community. More on-campus housing also reduces transportation demand and bolsters the local economy.
- **Will stimulate the local economy** by providing thousands of construction jobs during the implementation of the plan as well as over 4,000 permanent positions. The New Hospital will be a substantial job generator and will create 1,200 to 1,400 new permanent positions to service the additional beds. In 2011, UCSF voluntarily adopted a local hiring goal that mirrors the standards modeled by the San Francisco Board of Supervisors' Local Ordinance for projects with a contract value of $5 million and above.
- **Creates an enjoyable environment for residents and contributes to a walkable environment** with conceptual changes proposed in the campus plan such as improvements to the Irving Street entry, a "main street" pedestrian focus, and streetscape improvements on Parnassus Avenue. We also support the restoration of Fourth Avenue to the city grid and the "Park to Peak" connections

through campus that make the Mount Sutro Open Space Reserve further accessible to the public.

Given all of the above, we support UCSF's land use planning, including increased density at this infill location, and we appreciate the University's efforts to engage the community. Recognizing that this is an early stage of planning, we look forward to final commitments regarding public realm concepts and other community benefits, as well as future designs of the buildings proposed in the plan.

Sincerely,



Todd David, Executive Director

December 1, 2020
University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin St., 12th floor
Oakland, CA 94607

Via email to regentsoffice@ucop.edu

RE: SF YIMBY Support for the UCSF Comprehensive Parnassus Heights Plan (CPHP)

Dear University of California Board of Regents:

On November 10, 2020, UCSF presented its Comprehensive Parnassus Heights Plan to SF YIMBY. Having taken into consideration the presentation, vision and scope of this project, SF YIMBY is pleased to support the **UCSF Comprehensive Parnassus Heights Plan (CPHP).**

SF YIMBY is a network of grassroots pro-housing activists advocating for more inclusive housing policies in San Francisco. We drive policy change to increase the supply of housing at all levels of affordability to bring down the cost of living in opportunity-rich cities and towns. We envision an integrated society where every person has access to a safe, affordable home near jobs, services and opportunity.

UCSF demonstrated the need to modernize its medical and research facilities in order to meet California's 2030 Hospital Seismic Safety requirements and maintain its reputation as a world-class medical and research hub. CPHP proposes to increase the site's capacity by 2.04 million gross square feet, bringing the campus to 5.96 million square feet upon full build-out. The plan proposes 762 net new units of faculty and student/trainee housing, bringing the total to 984 units. Additionally, UCSF plans to expand upon housing investments at other UC sites across the city, for a total portfolio of 1,163 new units.

We commend UCSF for re-imagining its campus to better meet the healthcare needs of tomorrow in a way that provides desperately needed housing for its students, staff and faculty. The plan is an extraordinary commitment on behalf of the university to uphold its legacy of being a beloved neighbor. We understand the project is in the early stages of planning, look forward to collaborating with UCSF to finalize its commitments to community benefits, and eagerly anticipate reviewing future designs of the specific buildings proposed in the plan.

Cordially,

SF YIMBY

December 1, 2020
University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin St., 12th floor
Oakland, CA 94607

Via email to regentsoffice@ucop.edu

RE: HAND's Support for the UCSF Comprehensive Parnassus Heights Plan (CPHP)

Dear University of California Board of Regents:

On November 10, 2020, UCSF presented its Comprehensive Parnassus Heights Plan to the Haight-Ashbury Neighbors for Density (HAND). Having taken into consideration the presentation, vision and scope of this project, HAND is pleased to support the **UCSF Comprehensive Parnassus Heights Plan (CPHP).**

HAND is the Haight-Ashbury and District 5 neighborhood affiliate of San Francisco YIMBY. SF YIMBY is a network of grassroots pro-housing activists advocating for more inclusive housing policies in San Francisco. We drive policy change to increase the supply of housing at all levels of affordability to bring down the cost of living in opportunity-rich cities and towns. We envision an integrated society where every person has access to a safe, affordable home near jobs, services and opportunity.

UCSF demonstrated the need to modernize its medical and research facilities in order to meet California's 2030 Hospital Seismic Safety requirements and maintain its reputation as a world-class medical and research hub. CPHP proposes to increase the site's capacity by 2.04 million gross square feet, bringing the campus to 5.96 million square feet upon full build-out. The plan proposes 762 net new units of faculty and student/trainee housing, bringing the total to 984 units. Additionally, UCSF plans to expand upon housing investments at other UC sites across the city, for a total portfolio of 1,163 new units.

We commend UCSF for re-imagining its campus to better meet the healthcare needs of tomorrow in a way that provides desperately needed housing for its students, staff and faculty. The plan is an extraordinary commitment on behalf of the university to uphold its legacy of being a beloved neighbor. We understand the project is in the early stages of planning, look forward to collaborating with UCSF to finalize its commitments to community benefits, and eagerly anticipate reviewing future designs of the specific buildings proposed in the plan.

Cordially,

The Haight-Ashbury Neighbors for Density

San Francisco Westside Transportation and Accessibility Coalition

SFWTAC

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin St., 12th floor
Oakland, CA 94607

RE: SFWTAC Endorsement of UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents:

The San Francisco Westside Transportation and Accessibility Coalition (SFWTAC) is writing to express our support for the UCSF Parnassus Heights Plan.

SFWTAC is an organically unified group, established in October 2019. Together, we are comprised of merchant groups, disability rights activists, first responders, neighborhood organizations, and neighbors with a common goal of equity to access for all. All members align with the mission of bringing safe, equitable, and reliable transportation to the west side of San Francisco. The Coalition engages with stakeholders and elected officials to inform and advocate our approach.

UCSF presented its Comprehensive Parnassus Heights Plan (CPHP) to SFWTAC on July 15, 2020. Driven by UCSF's need to modernize UCSF's medical and research facilities and meet the state's 2030 Hospital Seismic Safety requirements, the Comprehensive Plan proposes to increase the site's capacity and add 762 net new units of faculty and student/trainee housing. Most importantly, UCSF's planning team has thought deeply about how to improve arrival, via all modes of transport, to campus, is looking at how to address larger mobility challenges by partnering with SFMTA, and is exploring the safety and greening improvements at the difficult intersection of Irving/Carl/Arguello. UCSF has worked to study their surrounding area to learn about the transportation needs of their visitors and neighbors. SFWTAC hopes to capitalize on the UCSF traffic study and expand it to the entire west side of San Francisco to provide comprehensive data to help inform policy decisions.

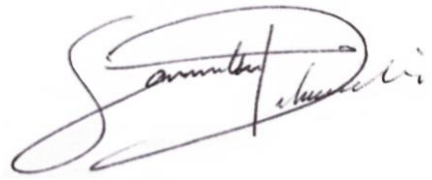
SFWTAC supports the June 2020 UCSF Comprehensive Parnassus Heights Plan because it brings the potential to enhance the transportation of the west side of San Francisco. We look forward to continuing an open dialogue with UCSF as the CPHP develops. Moving forward, UCSF and WTAC will fight to bring more equitable and reliable transportation to the west side.

Thank you for your time and consideration of this letter. Please direct any inquiries for the SFWTAC to sfwtac@gmail.com.

San Francisco Westside Transportation and Accessibility Coalition

SFWTAC

Sincerely,



Samantha Delucchi
Coalition Secretary
San Francisco Westside Transportation and Accessibility Coalition

SF Urban Riders
Promoting Offroad Cycling in San Francisco

December 23, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: San Francisco Urban Riders Support for UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents,

The San Francisco Urban Riders are excited to share our support for the Comprehensive Parnassus Heights Plan (CPHP) at the University of California, San Francisco (UCSF).

UCSF's flagship campus was established at Parnassus Heights over 150 years ago and is in critical need of revitalization. The COVID-19 pandemic has highlighted the need to invest in our local hospitals and that access to open space is a public health necessity. UCSF's Mount Sutro Open Space Reserve is a unique aspect of their campus as it is a 61 acre preserve adjoining their campus that residents throughout San Francisco utilize.

As the COVID-19 pandemic has illustrated, access to nature and the outdoors is an essential public health need. The San Francisco Urban Riders are proud to be partners with a leader in healthcare during this crisis to expand access to this area. We are pleased that the plan prioritizes nature and green space and thoughtfully incorporates the surrounding open space, including Mount Sutro, for the benefit of patients, staff, and visitors, alike.

We applaud UCSF's commitment to maintaining Mount Sutro for public use and the intentional incorporation of this treasured place into the long-term vision for the revitalized campus. We also support the planned increase of open space on campus, more than doubling what exists today (exclusive of the Reserve) and greater community access to Mount Sutro. The CPHP's "Park to Peak" design concept opens up the campus, which is situated between Golden Gate Park and Mount Sutro, through the coordination of planned trailheads at Mount Sutro, improved landscaping, and an enhanced connection between these two parks. In particular, we are enthusiastic about the opportunity to improve the bicycle network and trails, and the continued stewardship of the Mount Sutro Open Space Reserve and support for the Sutro Stewards programs.

UCSF engaged in a thoughtful, two-year, collaborative process with neighbors to develop a list of proposed community investments to be made through the life of the plan.
I strongly urge you to support UCSF's plans to revitalize their campus, making it a safer place to live, bike, work, and walk. The San Francisco Urban Riders are looking forward to partnering with UCSF in implementation of the CPHP.

Sincerely,

Matthew Blain
Chair, San Francisco Urban Riders

Hospital Council
Northern & Central California

October 12, 2020

2020 University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin St., 12th floor
Oakland, CA 94607

via email to regentsoffice@ucop.edu

RE: Hospital Council Endorsement of UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents:

The San Francisco Section of the Hospital Council Northern & Central California is comprised of the CEOs representing the public and private hospitals across the city. On behalf of the Section, I write to express our strong support of UCSF's *Comprehensive Parnassus Heights Plan* (Plan). We appreciate UCSF's efforts to share information with our members about the Plan, as well as its on-going, broader community engagement.

As the COVID-19 pandemic illustrates, hospitals must be prepared to meet the ever-changing and expansive needs of the communities each serves. While UCSF currently provides excellent care to both San Francisco and Marin Counties, it must both modernize medical and research facilities and meet the state's stringent 2030 Hospital Seismic Safety requirements. We support the Plan as it proposes to increase the site's capacity while improving the medical, clinical and research resources that solidifies Parnassus Heights as a world-class medical center and campus.

Notably, in addition to its essential role in San Francisco as a top-ranked medical center, UCSF is also the second-largest employer in San Francisco (after the City itself). As San Francisco reopens and recovers from the enormous economic impacts of the COVID-19 pandemic, this project will be an important economic driver, providing jobs in healthcare and construction and increasing economic activity across the city.

The Section is pleased to support the proposed Comprehensive Parnassus Heights Plan. We look forward to continued engagement with the team at UCSF so that we may provide the feedback of Council members as the Campus Redevelopment evolves.

Sincerely,

David Klein, MD, MBA
Chair, San Francisco Section, Hospital Council Northern & Central California

Regional Office 235 Montgomery Street, Suite 910 San Francisco, CA 94104-3004 415.616.9990 Fax: 415.616.9992

SAN FRANCISCO MARIN MEDICAL SOCIETY

August 12, 2020

2020 University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin St., 12th floor
Oakland, CA 94607

via email to regentsoffice@ucop.edu

RE: SFMMS Endorsement of UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents:

The San Francisco Marin Medical Society (SFMMS) represents over 3000 physicians across all medical specialties and phases of their careers in San Francisco and Marin Counties. We appreciate the UCSF team presenting its *Comprehensive Parnassus Heights Plan Vision* to the SFMMS Executive Committee in June 2020 for its review and consideration, and the extent of community consultation undertaken.

The SFMMS Executive Committee discussed the plan during its meeting of August 2020, with attention paid to the increased capacity to serve patients that redevelopment of the Parnassus Heights Campus would provide. It is our belief that this redevelopment is necessary if the physician community that we represent is to continue to provide excellent care to San Francisco and Marin Counties. Driven by UCSF's need to modernize UCSF's medical and research facilities and meet the state's 2030 Hospital Seismic Safety requirements, the *Comprehensive Plan* proposes to increase the site's capacity while replacing and renovating the medical, clinical and research facilities to avoid obsolescence and maintain Parnassus Heights' stature as a world-class medical and research facility. We believe the planned enhancements to the only health-focused academic medical center and campus within the University of California system will continue to attract the world's best physicians to San Francisco.

SFMMS is pleased to support the proposed *Comprehensive Parnassus Heights Plan Vision*. We encourage the team at UCSF to continue to work with SFMMS as needed and via its Executive Committee so that we may provide the feedback of our members during future planning and execution of the Campus Redevelopment.

We look forward to our continued collaboration.

Sincerely,



Brian Grady, M.D.
President, San Francisco Marin Medical Society

2720 Taylor Street, Suite 450, San Francisco, CA 94133 • www.sfmms.org • P 415.561.0850 • F 415.561.0833

December 17, 2020

To the University of California Regents:

The California Life Sciences Association is pleased to support the UCSF Comprehensive Parnassus Heights Plan. CLSA is the largest statewide life sciences public policy and business leadership organization in the state, and we have been advocating for sound public policy on this issue for nearly a decade. Our mission is to advance California's world-leading life sciences innovation ecosystem by advocating for effective national, state, and local public policies and supporting entrepreneurs and life science business.

As you know, the Bay Area is a hotbed for innovation. The region boasts one of the most robust biomedical hubs in the world and supports 27% of California's life sciences jobs. In San Francisco alone there are close to 40 companies, from small incubators to large facilities like FibroGen, Bristol Meyers Squibb, and Nektar who work to bring new therapies to the market to help fight COVID-19, cancer, kidney disease, blindness, and HIV. To that end, UCSF plays an essential role in the life science ecosystem as a top-ranked medical center, University of California health sciences campus, and major biotechnology research center. Numerous biotechnology companies have been created because of biotechnology research pioneered at UCSF.

UCSF's aging facilities have not kept pace with the University's renowned status nationwide. Its flagship Moffitt Hospital was designed in the 1940s and opened in the 1950s and is now unable to meet the growing demand for patient referrals and modern standards of care. Its aging research labs make it more difficult for UCSF to recruit and retain the world-class faculty and students that make UCSF a world-class university and medical center, and which UCSF needs in order to lead cutting edge research to fight diseases like COVID-19.

To that end, CLSA believes that UCSF's Comprehensive Parnassus Heights Plan is key to maintaining California's leadership in biotechnology research and urges your support.

Sincerely,



Mike Guerra
President & CEO | California Life Sciences Association (CLSA)
The Premier Life Sciences Trade Association for California

SAN FRANCISCO BAY AREA PHYSICIAN ASSISTANTS

STEERING COMMITTEE:

Martin Kramer, PA-C
Jennifer Nossokoff, PA-C
Kurtis Opp, PA-C
Nais Raulet, PA-C
Lisa Spitalewitz, PA-C
Carl Stein, MHS, PA-C

December 10, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: Physician Assistants in Support of UCSF's Comprehensive Parnassus Heights Plan and New Hospital

Dear University of California Board of Regents,

I am writing today on behalf of the San Francisco Bay Area Physician Assistants (SFBAPA) to express support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

The San Francisco Bay Area Physician Assistants represents over 700 physician assistants in and around San Francisco. We help our members stay current on medical knowledge and practice regulations and continue to grow the profession to meet the rising demand for physician assistants.

We appreciate that as UCSF is reimagining its oldest campus to meet the health-care needs of tomorrow, it remains committed to strengthen the economic and cultural vitality of the surrounding neighborhood.

UCSF's facilities at Parnassus Heights are outdated, inflexible, undersized and clinically obsolete – and the future UCSF Helen Diller Medical Center at Parnassus Heights is an integral part of the CPHP. Building a facility that fosters the bench to bedside connection between UCSF's leading educational programs and world-renowned researchers will enhance health
care and accelerate discovery. The increase in new hospital beds from 475 to 675 is crucial to meet the needs of a growing and aging Bay Area population.

The campus improvements and new hospital will continue to attract talented physician assistants to San Francisco, and are critical for the physician assistant community to continue to provide excellent care to San Francisco. Ensuring the new hospital is modern and flexible will support our physician assistants as well as advance patient health throughout the Bay Area.

The San Francisco Bay Area Physician Assistants is in strong support of UCSF's plans to revitalize Parnassus Heights and build a new hospital, which will allow us to continue advancing health care throughout San Francisco together.

Sincerely,

Martin Kramer PA-C
Martin Kramer PA-C (Dec 9, 2020 18:00 PST)

Martin Kramer, PA-C
Chair, San Francisco Bay Area Physician Assistants Steering Committee

california **pharmacists** association

November 24, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: Support for UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents,

I am writing today on behalf of the California Pharmacists Association to express support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

The California Pharmacists Association (CPhA) was founded in 1869 and is the largest state association representing pharmacists. CPhA represents pharmacists, technicians and student pharmacists from all practice settings. These practice settings include community pharmacy (both independent owners and employees working in chain drug stores), hospitals & health-systems, and specialty practices such as compounding, managed care, and long term care.

UCSF has been an anchor institution in the San Francisco Bay Area for over a century and is a major contributor to the health and well-being of the community. Home to nationally ranked professional health science schools, cutting edge research, and high-quality patient care, Parnassus Heights is UCSF's original campus and in need of investment.

While UCSF is an acclaimed academic medical center, the facilities at Parnassus Heights do not match the quality of health sciences within. UCSF's Moffitt Hospital was built in 1955 and cannot accommodate advancements in medical equipment and technology. A 21st century state-of-the art pharmacy is critical to retaining and recruiting top clinicians, staff, researchers and students and is necessary to sustaining UCSF's public mission of top-quality patient care, research and education.

The future UCSF Helen Diller Medical Center at Parnassus Heights is an integral part of the CPHP. The new hospital at Parnassus Heights plans to increase the square footage of the main and the operating room pharmacies to accommodate growth commensurate with a larger hospital. The future hospital will also allow the pharmacy to be in closer proximity to patients and the operating rooms so medications can be more readily distributed to critical areas. More collaborative spaces envisioned within the new hospital will allow for focused discussions regarding plan of care, timely decisions and teaching opportunities for our future pharmacists.

With the current patient census at record highs, it is essential for UCSF to expand access to accommodate increasing patient demand. The new hospital will increase UCSF's capacity by 42% to keep pace with the increase and aging population and growing need for complex care.

To ensure UCSF can continue to advance health in partnership with the California Pharmacists Association, I urge you to support UCSF's plans to revitalize their flagship campus and build a new hospital.

Sincerely,

Susan A. Bonilla

Susan Bonilla, MEd
Chief Executive Officer and Secretary of the Board of Trustees,
California Pharmacists Association

Golden-Gate Chapter of Health-System Pharmacists
821 Irving St #225072
San Francisco, CA 94122
http://cshpgoldengate.org

2019 CSHP
Chapter of Distinction

November 20, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: Support for UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents,

The Golden Gate Society of Health-System Pharmacists Board is in full support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

UCSF's facilities at Parnassus Heights are outdated, inflexible, undersized and clinically obsolete. State seismic laws call for Moffitt Hospital to be structurally retrofitted or decommissioned as an inpatient facility by 2030. The future UCSF Helen Diller Medical Center at Parnassus Heights is an integral part of the CPHP. While UCSF is an acclaimed academic medical center, the facilities at Parnassus Heights do not match the quality of health sciences within. UCSF's Moffitt Hospital was built in 1955 and cannot accommodate 21st century advances in medical equipment and technology.

With the current patient census at record highs, it is essential that UCSF expands access to accommodate increasing patient demand. The new hospital at Parnassus Heights will increase UCSF's capacity by 42% to keep pace with the increase and aging population and growing need for complex care – increasing the number of beds from 475 to 675.

A 21st century state-of-the art pharmacy is critical to retaining and recruiting top clinicians, staff, researchers and students and is necessary to sustaining UCSF's public mission of top-quality patient care, research and education. The new hospital at Parnassus Heights plans to increase the square footage of the main and the operating room pharmacies to accommodate growth commensurate with a larger hospital. The future hospital will also allow the pharmacy to be in closer proximity to patients and the operating rooms so medications can be more readily distributed to critical areas. More collaborative spaces envisioned within the new hospital will allow for focused discussions regarding plan of care, timely decisions and teaching opportunities for our future pharmacists.

To ensure UCSF can continue to advance health in partnership with the Golden Gate Society of Health-System Pharmacists, I urge you to support UCSF's plans to revitalize their flagship campus and build a new hospital.

Sincerely,

Sylvia Stoffella , PharmD
President, Golden Gate Society of Health-System Pharmacists

Alumni Association of UCSF
UCSF Box 0970
San Francisco, CA 94143
www.ucsf.edu
alumni.ucsf.edu

UCSF Alumni

June 1, 2020

AAUCSF Supports the Comprehensive Parnassus Heights Plan

The Board of Directors of the Alumni Association of UCSF emphatically supports the Comprehensive Parnassus Heights Plan. This long-term planning project prioritizes community engagement in order to envision a 21st century educational and clinical health science campus. The new design of the Parnassus Campus aims to create an environment that is more welcoming, navigable, and accessible to the campus and local communities alike. The plan also brings the campus up to the latest seismic codes.

For over 100 years Parnassus Heights has been a vital academic healthcare partner for San Franciscans as a whole. From assisting thousands of San Franciscans following the 1906 earthquake to the present COVID-19 pandemic, UCSF remains committed to the health of those both at home and afar.

The Comprehensive Parnassus Heights Plan will allow future UCSF students to receive top-tier training in facilities promoting interdisciplinary collaboration and highly specialized care in order to further the UCSF mission of *advancing health worldwide*. We are proud of the 68,000 alumni we represent as they apply UCSF's passion for educating, improving and saving lives, and generating and sharing new knowledge across the country and the world. No matter how long it has been since they last set foot at Parnassus Heights, it remains pivotal in their success as leaders in health care and science.

The Comprehensive Parnassus Heights plan will ensure that generations to come will benefit from and contribute to the legacy of UCSF. From epidemiologic research on vulnerable populations to the latest in minimally invasive neonatal surgery, UCSF is known for passionate researchers and consistent advancement of the biomedical field. As alumni we see the Comprehensive Parnassus Heights Plan as a vital vision for a modernized future of UCSF.

This statement was approved by the AAUCSF Board of Directors on June 2, 2020.

Judith Lamberti

Judith Lamberti, MD '78
President, Alumni Association of UCSF

Print Form

Introduction Form

By a Member of the Board of Supervisors or Mayor

Time stamp
or meeting date

I hereby submit the following item for introduction (select only one):

- [x] 1. For reference to Committee. (An Ordinance, Resolution, Motion or Charter Amendment).
- [ ] 2. Request for next printed agenda Without Reference to Committee.
- [ ] 3. Request for hearing on a subject matter at Committee.
- [ ] 4. Request for letter beginning :"Supervisor _____ inquiries"
- [ ] 5. City Attorney Request.
- [ ] 6. Call File No. _____ from Committee.
- [ ] 7. Budget Analyst request (attached written motion).
- [ ] 8. Substitute Legislation File No. _____
- [ ] 9. Reactivate File No. _____
- [ ] 10. Topic submitted for Mayoral Appearance before the BOS on _____

Please check the appropriate boxes. The proposed legislation should be forwarded to the following:

- [ ] Small Business Commission
- [ ] Youth Commission
- [ ] Ethics Commission
- [ ] Planning Commission
- [ ] Building Inspection Commission

Note: For the Imperative Agenda (a resolution not on the printed agenda), use the Imperative Form.

Sponsor(s):

Supervisor Dean Preston

Subject:

Urging California Regents to Consider the Proposed UCSF Parnassus Expansion Plan EIR at their March 2021 meeting.

The text is listed:

Resolution urging the California Regents to move consideration of the proposed University of California at San Francisco (UCSF) Parnassus Expansion Plan Environmental Impact Report (EIR) from their January 2021 meeting to their March 2021 meeting.

Signature of Sponsoring Supervisor: _____

For Clerk's Use Only

University of California
San Francisco

Office of Community & Government Relations

Box 0462
3333 California St., Suite 103
San Francisco, CA 94143

tel: 415.476.3206
fax: 415.476.3541

www.ucsf.edu

January 11, 2021

Land Use & Transportation Committee
San Francisco Board of Supervisors
1 Dr. Carlton B. Goodlett Place
San Francisco, CA 94102

Chair Peskin and Members of the Land Use & Transportation Committee,

Over the last two years, UCSF has worked with thousands of community members to develop a bold 30-year vision for our original campus at Parnassus Heights called the Comprehensive Parnassus Heights Plan (CPHP).

UCSF plans to update our campus to support our care delivery, research, education, and public service missions. Together with accompanying community investments, the plan envisions a future Parnassus Heights campus and hospital that not only supports UCSF's students, patients, faculty and staff, but also improves the daily experience of our neighbors and addresses local challenges facing our city.

The CPHP will create a new hospital that meets the 2030 seismic safety guidelines required by state law, as well as expand inpatient care capacity by 200 beds in order to meet growing regional demand for UCSF's specialty care. The plan will also update aging labs and classrooms that currently have an average age of 50 years old, in order to continue to attract and train the world class faculty and students that make UCSF one of the nation's leading academic medical centers.

Community Outreach

Beginning in July 2018, UCSF worked closely with neighbors, community leaders, elected officials, and city partners on a two year process to develop ideas for community investments. This process included:

- 28 community meetings
- 71 meetings with local, state, and federal elected officials
- 2,400 community surveys collected
- Regular updates to a 1,200 member listserv
- A total of 10,000 neighbors actively engaged

As a result of this process, the community identified 25 specific investment ideas that aim to benefit the local neighborhood and address potential impacts of the CPHP.

Memorandum of Understanding

Over the last several months, UCSF has worked closely with the City and County of San Francisco to develop a Memorandum of Understanding (MOU) that refines and aligns the opportunities where UCSF and the City will collaborate on community investments to accompany the CPHP.

The MOU includes UCSF investments in:

- **Housing**: 1,263 net new housing units, 40% of all new and existing units are available to households earning up to 120% of AMI, and half of those to household earning up to 90% of AMI.

- **Transportation**: $20 million to SFMTA to improve transit to Parnassus Heights, including increased capacity on the N-Judah, as well as streetscape improvements to make streets safer, better lit, and more beautiful.

- **Open Space:** UCSF will maintain its Mt. Sutro Open Space Reserve at no less than its current size of 61 acres, while improving wayfinding as part of our "park to peak" vision between the Reserve and Golden Gate Park.

- **Community Workforce and Equity:** A revitalized campus will bolster the economic strength of the community as we recover from COVID-19, creating thousands of new construction jobs and permanent positions over the life of the project. UCSF has committed to a 30 percent local hire goal for project construction jobs, through our existing partnership with the CityBuild program. UCSF will also expand its EXCEL workforce training program, in partnership with the City's JobsNow! program to provide more opportunities for entry-level administrative jobs in health care for City residents. We commit to expand these existing programs by a combined $5 million over the next 10 years. Finally, UCSF commits to leverage its commitment as an Anchor Institution to advance economic security and opportunity in under-resourced communities to improve health equity, including increasing spending with small, local and diverse businesses by at least 50% by 2024.

- **Equity and Educational Opportunities:** UCSF will strengthen its existing partnerships with SFUSD – such as the Science Education Partnership and Center for Science Education and Outreach – to support STEM curriculum, internship opportunities, pipeline programs and providing increased exposure to career opportunities in health care and mental health care professions for underrepresented and minority youth.

- **Behavioral Health:** To support the City's mental health care needs, UCSF will continue to maintain inpatient psychiatric beds at UCSF facilities throughout the City, as well as at Zuckerberg San Francisco General Hospital. We will also explore partnerships and collaborations to: increase the number of adult inpatient psychiatric beds for Medi-Cal patients; provide mental health care services; and continue collaborations with the Department of Public Health.

Community investments in the MOU go beyond CEQA mitigation measures, which will be addressed in the Final Environmental Impact Report. We thank the City family for their time and

feedback, and commitment to making sure UCSF's community investments align with the City's priorities and community feedback.

Community Support

We are proud to have received support letters for the plans for Parnassus Heights from over 20 community organizations, including SPUR, San Francisco Bicycle Coalition, Inner Sunset Park Neighborhood Association Board of Directors, Westside Transportation and Accessibility Coalition, Bay Area Council, San Francisco Housing Action Coalition, local Chambers of Commerce, and elected officials, such as Congresswoman Jackie Speier, State Senator Scott Wiener, and Assemblymembers Phil Ting, David Chiu, Kevin Mullin, and Marc Levine. These letters are enclosed and addressed to the UC Board of Regents, who will vote to approve the plan to revitalize our Parnassus Heights campus in January.

We are also honored to have received hundreds of support letters from San Francisco residents and hundreds more who have signed a petition in support of the plans for Parnassus.

The CPHP is the roadmap to modernize our labs and classrooms and build a new hospital to serve our community with enough beds to accommodate current and future patient demand. The MOU is our commitment to San Francisco to create a more welcoming environment for the community with pathways to Mount Sutro, enhance onsite amenities and services, generate local jobs and stimulate the economy during a pivotal time for the future of our city.

Parnassus Heights is more than where we work, study and provide care. It's the neighborhood where UCSF was born more than a century ago, and where many of us live today. We look forward to our continued work together to support new housing and transit solutions that will help us address everyday challenges facing our shared neighborhood.

Thank you for your leadership in our community and partnership with UCSF. UCSF remains committed to continuing engagement on future projects, such as with the New Hospital design process that is anticipated to begin in early 2021. We look forward to our continued collaboration.

In partnership,



Francesca Vega
Vice Chancellor, UCSF Community & Government Relations

HOUSE OF REPRESENTATIVES
WASHINGTON, D.C. 20515

JACKIE SPEIER
CALIFORNIA

October 27, 2020

The Honorable John Perez, Chair
University of California, Board of Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607

Dear Chair Perez:

I write to respectfully express my support for the University of California San Francisco (UCSF) Comprehensive Parnassus Heights Plan. It is my understanding that the university has worked with neighbors over the past two years to address concerns. I hope that these conversations continue.

When I served in the state legislature, I was the author of legislation that extended the deadline for seismic retrofitting of our hospitals that agreed to take proper interim measures to ensure safety. UCSF Parnassus was a campus identified at the time as in need of replacement. Decades later, the comprehensive plan before you will finally enable this to happen. UCSF patients and personnel will obviously benefit.

In addition, it is my understanding that the university intends to construct housing on the site in order to provide for UCSF personnel. As the Regents are aware, housing for university personnel in the Bay Area is scarce and providing units on campus will help reduce traffic and aid in the university's recruitment efforts.

The university's research continues to lead the world in finding new solutions to our nation's most pressing medical challenges, including of late COVID-19. The university system must reconstruct and change its campuses to meet these evolving needs.

Many years ago, no one entirely saw the transformative impact upon medical research that the campus in Mission Bay would have. However, those few who tried, and who lent their support to Mission Bay, provided the crucial foundations for the medical miracles that we all enjoy today.

Knowing your longtime leadership in the state, I know you will review this plan by taking a multi-generational approach. We all recognize that no one can clearly see all of the benefits of a transformed campus, but everyone in the future will clearly benefit from the discoveries and care that will emerge from a new Parnassus campus. Approving this plan will be a demonstration of the university's motto, Fiat Lux. I respectfully suggest that now is the moment to rise to that hopeful mandate.

All the best,

Jackie Speier

KJS/bp

NOT PRINTED OR MAILED AT GOVERNMENT EXPENSE

STATE CAPITOL
P.O. BOX 942849
SACRAMENTO, CA 94249-0115

California Legislature

January 4, 2021

The Honorable John Pérez, Chair
University of California, Board of Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607

Dear Chair Pérez,

As legislators representing the City and County of San Francisco, San Mateo, Marin and Sonoma Counties, we are pleased to offer our support for UCSF's Comprehensive Parnassus Heights Plan (CPHP). For more than a century, UCSF at Parnassus Heights has been the birthplace of world-class research, a top-ranked training ground for health care professionals and scientists, and the destination for complex care that only UCSF can provide.

The shared history of the Bay Area and UCSF spans more than a century of partnership in ensuring the health of our community. From the 1906 earthquake to the HIV epidemic to COVID-19, UCSF has served the health care needs of Northern California's diverse communities during public health care crises and every year in between.

To keep pace with the Bay Area's and California's growing health care needs, UCSF is making plans to replace and renovate some of its outdated and seismically vulnerable buildings. State-of-the-art facilities will strengthen UCSF's renowned research and training programs. Due to the COVID-19 pandemic, every Californian understands the importance of this research and training at UCSF.

The project also includes a modern hospital with more capacity so that the UCSF Helen Diller Medical Center at Parnassus Heights no longer has to turn away patients because it does not have enough beds. UCSF states it will have to turn away 3,000 patients this year alone. With the Bay Area and California's population projected to grow over the next decade – including among the elderly, who typically require specialized care – it is essential for UCSF to build a modern hospital to address this critical capacity shortage.

The Parnassus Campus is located in the heart of San Francisco. With this in mind, the collaborative work that UCSF has done with the community and the city to address the impact of the development in the neighborhood pleases us. Most importantly, we understand that UCSF is working with city and community leaders to address the potential challenges of a redeveloped campus. UCSF is planning over 1,000 units of new housing and commits itself to exploring with the city ways to ease traffic through enhancements to transit and employee work-at-home solutions to lower the on-campus population.

We are proud to represent UCSF and nearby communities in the Legislature, and support their efforts through the Comprehensive Parnassus Heights Plan to maintain their position as the leading university dedicated exclusively to the health sciences.

Sincerely,

Philip Y. Ting
Assemblymember, 19th District

Scott Wiener
Senator, 11th District

David Chiu
Assemblymember, 17th District

Kevin Mullin
Assemblymember, 22nd Assembly District

Marc Levine
Assemblymember, 10th District

INNER SUNSET PARK NEIGHBORS

November 5, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607

Dear University of California Board of Regents,

The Board of Directors of the Inner Sunset Park Neighbors (ISPN) writes in support of the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

UCSF is a valued contributor within San Francisco's economic and social landscape. As a top job creator and the second largest employer in the City and County, UCSF contributes to San Francisco's energy and "innovation ecosystem," attracting world-class talent to live, work, and study; many of whom choose to live in our beloved neighborhood- the Inner Sunset. The CPHP will bring much-needed improvements to the Parnassus Heights campus, allowing UCSF to continue being a major economic driver in the Inner Sunset.

Over the past two years, ISPN board members have been engaged in developing the CPHP through the thoughtful process UCSF created to embed neighbor voice in the plan. Members of our organization were engaged from the beginning as part of the Parnassus Heights Community Working Group to create a plan that opens the campus to the neighborhood. ISPN members also participated in the Advisory Committee on the Future of Parnassus Heights to identify potential improvements to help further neighborhood goals for the Parnassus Heights campus. UCSF was responsive and eager to hear our input.

With the input of organizations like the ISPN, a variety of community investments were identified in the areas of open space, mobility, and housing. ISPN is encouraged by UCSF's collaboration with the City and County of San Francisco to develop a MOU and discuss the feasibility of these ideas that range from building more housing, increasing capacity of Muni lines that serve our neighborhood, and connecting Golden Gate Park and Mount Sutro through our neighborhood streets.

On behalf of the Inner Sunset Park Neighbors, we urge you to support UCSF's Comprehensive Parnassus Heights Plan as they are a valued neighbor. The ISPN looks forward to continuing to work with UCSF to bring these community investments to fruition and ensure neighbor voice continues to be part of the process.

Sincerely,

Martha D. Ehrenfeld

Martha Ehrenfeld
President, Inner Sunset Park Neighbors

SPUR
San Francisco | San Jose | Oakland

July 10, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin St.,12th floor
Oakland, CA 94607
via email to regentsoffice@ucop.edu

RE: SPUR Endorsement of UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents:

UCSF presented its Comprehensive Parnassus Heights Plan Vision to SPUR's Project Review Advisory Board at our June 30, 2020 meeting for review and consideration. **The SPUR Project Review Advisory Board finds this plan to be an appropriate set of uses for this location and endorses UCSF's concept as presented at this time, recognizing that project design and some policy details are not yet solidified.**

SPUR is generally focused on policies, plans and codes rather than on individual projects. In order to support well-designed, high-quality infill development, we prefer to help set good rules around zoning, fees, housing affordability, sustainability, etc. However, on occasion, our Project Review Advisory Board will review and endorse development proposals of citywide or regional importance, such as the UCSF Comprehensive Parnassus Heights Plan, evaluating their potential to enhance the vitality of the city and region according to the policy priorities and principles of good placemaking supported by SPUR.

Located south of Golden Gate Park and north of Mount Sutro, between the Cole Valley and Inner Sunset neighborhoods, the Parnassus Heights Campus is a 107-acre site (including 61 acres of Mount Sutro Open Space Reserve). Driven by UCSF's need to modernize UCSF's medical and research facilities and meet the state's 2030 Hospital Seismic Safety requirements, the Comprehensive Plan proposes to increase the site's capacity by 2.04 million gross square feet, bringing the campus to 5.96 million square feet at full build-out. The plan will add 762 net new units of faculty and student/trainee housing, bringing the total to 984 units.

The Comprehensive Plan lays out master plan-level guidance for the overall physical environment at Parnassus Heights. While it does not include specific architectural designs for individual buildings or projects, it does include design guidelines and outlines the configuration of buildings and open space areas as well as the major types of uses within them (such as inpatient, outpatient, research, instruction, support, housing, and parking), with special attention paid to the adjacency of uses especially at the intersection of clinical, research and instruction uses.

SPUR affirms that the Comprehensive Parnassus Heights Plan:

- ✓ **Is located at an appropriate location for development**, near transit and infrastructure and not on a greenfield site. The Parnassus Heights campus is located in an infill location, on the N Judah Muni line and near other frequent transit options such as buses and University-run shuttles.
- ✓ **Provides an appropriate mix of land uses** including medical, research, clinical, educational, residential and open space uses. The plan contributes to the diversity of the city's housing stock, fosters economic development and provides critical amenities and services to the surrounding community. This complex plan replaces an aging hospital, research facilities and infrastructure, and it incorporates an additional 762 units of much-needed faculty and student housing into the overall campus.
- ✓ **Provides sufficient density at the site** without expanding the existing campus boundaries, supporting a key medical institution in San Francisco and preventing underutilization of land, serving the future needs of Bay Area residents.
- ✓ **Creates a good place for people and contributes to a walkable environment** with conceptual proposed changes to the campus plan, including improvements to the Irving Street entry, a "main street" pedestrian focus and streetscape improvements on Parnassus Avenue, the restoration of Fourth Avenue to the city grid and the "Park to Peak" connections through campus that further open up Mount Sutro Open Space Reserve to the public. We also appreciate that the plan reduces the amount of parking by 380 spaces from the existing number.

The SPUR Project Review Advisory Board finds this plan to set out an appropriate set of land uses for this location and endorses the concepts proposed in the Comprehensive Parnassus Heights Plan. We understand the need to replace and renovate the medical, clinical and research facilities to avoid obsolescence, meet seismic code upgrade requirements and

maintain Heights' stature as a world-class medical and research hub. support UCSF's use planning, including density, at this infill location, and we appreciate the efforts to engage the With that in is crucial that robust transit and public realm improvements be paired with these changes. We would also support any additional housing that could be added, which serves a dual role as a transportation demand management measure. Lastly, we are excited about the "Park to Peak" concept, which could be a character-defining feature for the community, and we encourage the university to comprehensively build out those physical connections. Recognizing that this is an early stage of planning, we look forward to final commitments around public realm concepts and other community benefits. We are encouraged by the design team selection this week and look forward to future designs of the buildings proposed in the plan.

Please do not hesitate to contact us or Kristy Wang, SPUR's Community Planning Policy Director, with any questions or clarifications.

Sincerely,

Charmaine Curtis Diane Filippi
Co-Chairs, SPUR Project Review Advisory Board

cc: SPUR Board of Directors

June 3, 2020

SENT VIA EMAIL

San Francisco Planning Commission
1650 Mission Street, 4th Floor, Suite 400
San Francisco, CA, 94103

RE: UCSF Comprehensive Parnassus Heights Plan

Dear President Koppel and Planning Commissioners,

California is experiencing an unprecedented housing shortage that, without significant intervention, will devastate our cities and communities. The California Department of Housing and Community Development estimates that the state needs to build 180,000 new units of housing annually by 2025 to meet projected population growth - over 100,000 more units than our current pace. According to Next 10's *Missing the Mark: Examining the Shortcomings of California's Housing Goals*, San Francisco is far behind in most of their RHNA (Regional Housing Needs Allocation) targets. In fact, the report estimates the County will not meet its very low income target until 2030, low income until 2025, and moderate income levels until 2045. This shortage is degrading the quality of life for all of San Francisco, pushing out long-time residents and future generations alike.

The UCSF Comprehensive Parnassus Heights Plan includes a densification and expansion of housing opportunities on campus, more than quadrupling the number of units that currently exists. This plan will create new on-campus housing opportunities for students, trainees, faculty, and staff. As you are aware, there is a significant need for additional housing in San Francisco, especially for students and the workforce. For this and the following reasons, the Bay Area Council strongly supports this proposed project:

- **New On-Campus Housing for Students and Trainees** – This project will increase the amount of housing on site by over 4x and provide housing for students, medical trainees, faculty and workforce housing. The on-campus housing opportunities will allow residents to walk to their daily activities on campus. This project demonstrates that locating housing near jobs can alleviate traffic with new housing, rather than exacerbate it. The housing densification project is a priority and will occur in first 10 years of the project as part of the Initial Phase.

P 415.946.8777
F 415.981.6408
353 Sacramento Street, 10th Floor
San Francisco, California 94111
1215 K Street, Suite 2220
Sacramento, California 95814

- **Transit Accessibility & Alternative Transportation** – Over half of those arriving to UCSF Parnassus arrive by transit or bicycle. The campus is directly connected to the SFMTA transit system via the N Judah light rail line which runs by the Irving Street entrance. Improvements to the Irving Street entrance will further encourage use of public transit, improve the arrival experience, and create a welcoming campus to visitors, patients and the public. The plan includes a mobility component to promote and support alternative transportation strategies and provide pedestrian safety improvements.

- **Robust Community Engagement and Community Benefits –** Community engagement efforts for this project have been ongoing since the fall of 2018. The process began with a community working group in which the neighborhood was engaged in a re-envisioning process to inform the plan. Over 1,000 survey responses with community member concerns and feedback were considered. The ongoing effort has included focused discussions on the public realm, connectivity to nature, mobility, and housing. A wide range of community benefits have been incorporated into the plan in order to offset impacts to the existing community, including a new network of public open spaces, improved streetscapes, and publicly-accessible connections between Golden Gate Park and Mount Sutro.

- **New Hospital at Parnassus** – A new hospital will increase patient capacity to keep pace with demand and provide additional space for research, academic, support, and clinical uses. The new hospital will address issues with overcrowding, seismic compliance, and functional obsolescence that the aging Moffit Hospital currently faces.

The UCSF Comprehensive Parnassus Heights Plan improves upon the existing condition of the campus by drastically increasing the amount of housing on-site, expanding medical and research capacity with new state-of-the-art facilities, and improving the public realm for the community. On behalf of the Bay Area Council, we urge you to support this project.

Sincerely,

Matt Regan

Matt Regan
Senior Vice President
Bay Area Council

P 415.946.8777
F 415.981.6408
353 Sacramento Street, 10th Floor
San Francisco, California 94111
1215 K Street, Suite 2220
Sacramento, California 95814

December 18, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street
12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: UCSF's Comprehensive Parnassus Heights Plan- Hispanic Chamber of Commerce

Dear University of California Board of Regents,

I write to you to convey Mission Hiring Hall's enthusiastic support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

UCSF is a powerful contributor within San Francisco's economic and social landscape. As a top job creator and the second largest employer in the City and County, UCSF contributes to San Francisco's energy and "innovation ecosystem," attracting world-class talent to live, work, and study.

As San Francisco recovers from the economic toll of COVID-19, UCSF's thirty-year plan will be a key economic driver in rebuilding our workforce. New jobs will be created over the course of redeveloping the Parnassus Heights campus, including an estimated 1,200-1,400 labor jobs through construction of the new, state-of-the-art hospital and the same amount of permanent positions once the hospital opens.

This CPHP envisions a reinvigorated Parnassus Heights campus that both strengthens the neighborhood's economic and cultural vitality and allows UCSF to deliver world-class health care and research to San Francisco, the Bay Area, and the global community for decades to come.

On behalf of Mission Hiring Hall, I urge you to support the Comprehensive Parnassus Heights Plan.

Sincerely,

Michelle Leonard-Bell
General Manager
Email: mleonardbell@missionhiringhall.org

Charity Cultural Services Center
博愛文化服務中心
731 Commercial Street, San Francisco CA 94108
Tel: (415) 989-8224 • Fax: (415) 391-0525
Email: info@sfccsc.org • Web: http://sfccsc.org

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street
12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

November 16, 2020

Re: UCSF's Comprehensive Parnassus Heights Plan- Hispanic Chamber of Commerce

Dear University of California Board of Regents,

I write to you to convey Charity Cultural Services Center's enthusiastic support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

UCSF is a powerful contributor within San Francisco's economic and social landscape. As a top job creator and the second largest employer in the City and County, UCSF contributes to San Francisco's energy and "innovation ecosystem," attracting world-class talent to live, work, and study.

As San Francisco recovers from the economic toll of COVID-19, UCSF's thirty-year plan will be a key economic driver in rebuilding our workforce. New jobs will be created over the course of redeveloping the Parnassus Heights campus, including an estimated 1,200-1,400 labor jobs through construction of the new, state-of-the-art hospital and the same amount of permanent positions once the hospital opens.

This CPHP envisions a reinvigorated Parnassus Heights campus that both strengthens the neighborhood's economic and cultural vitality and allows UCSF to deliver world-class health care and research to San Francisco, the Bay Area, and the global community for decades to come.

On behalf of Charity Cultural Services Center-San Francisco, I urge you to support the Comprehensive Parnassus Heights Plan.

Sincerely,

Ashley Cheng
Executive Director

Coalition to Grow San Francisco
San Francisco, CA

December 28, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

RE: Support for UCSF's Comprehensive Parnassus Heights Plan from Grow SF

Dear University of California Board of Regents,

Grow SF envisions a San Francisco that is inclusive, livable, sustainable, and affordable for all families. We want healthy transportation systems, more housing, and smart growth to happen in partnership with organizations and their employees who are committed to San Francisco.

That is why we wholeheartedly support UCSF's Comprehensive Parnassus Heights Plan (CPHP) and their inclusive community engagement process that resulted in identifying neighbor-driven priorities for community investments such mobility and housing. UCSF is a valued contributor within San Francisco's economic and social landscape. As a top job creator and the second largest employer in the City and County, UCSF attracts and maintains world-class talent to live, work, and study in San Francisco; many of whom choose to live in the surrounding neighborhood. The CPHP will bring much-needed improvements to the Parnassus Heights campus, allowing UCSF to continue being a major economic driver in the city.

San Francisco has not been able to build enough housing for decades. This has led to skyrocketing rents, increasing homelessness, and reduced economic opportunity as rent eats up an ever-growing amount of everyone's paycheck. We support making it easier to build homes at all price points to reduce rent and displacement pressures, once again making San Francisco a city where renters and first-time homeowners can thrive. San Francisco's transit network could be one of the best in the country, but unfortunately gets caught in the same traffic as cars, reducing reliability, service, and efficiency. We support making San Francisco a truly transit-first city with more bus lanes, bike infrastructure, and Muni/BART investments that make it easier for everyone to get around. Climate Change is real, and automobiles are the number one source of carbon emissions in the state. We support building more housing in urbanized coastal areas with temperate weather and strong public transit to reduce VMT.

The UCSF Parnassus Heights campus plan would bring a world class hospital and research facility to the immediate neighborhood and beyond. It would also create over 1,000 new housing units, thousands of jobs, additional bike infrastructure, and direct millions of dollars to San Francisco's transit system. COVID-19 has taken a massive toll on our great city. People are out of work, our public transportation systems have a huge deficit, and our hospital beds are filling up. This project is exactly what we need for San Francisco to come back from the pandemic even stronger.

We are encouraged by UCSF's collaboration with the City and County of San Francisco to develop a Memorandum of Understanding and discuss the feasibility of community ideas that range from constructing more housing, increasing capacity of Muni to serve our neighborhood, and connecting Golden Gate Park and Mount Sutro through our neighborhood streets.

On behalf of the GrowSF, we urge you to support UCSF's Comprehensive Parnassus Heights Plan as a valued contributor to creating a better future for San Francisco.

Sincerely,



Sachin Agarwal
Founder, Grow SF

235 Montgomery St., Ste. 760, San Francisco, CA 94104
tel: 415.392.4520 • fax: 415.392.0485
sfchamber.com • twitter: @sf_chamber

June 3, 2020

President Koppel and San Francisco Planning Commission
San Francisco City Hall
1 Dr. Carlton B. Goodlett Place
San Francisco, CA

Re: UCSF Comprehensive Parnassus Heights Plan

Dear President Koppel and Members of the San Francisco Planning Commission,

On behalf of the San Francisco Chamber of Commerce, I am pleased to **support the UCSF Comprehensive Parnassus Heights Plan.** As San Francisco recovers from the COVID-19 pandemic and re-opens its economy, this 30-year project will be a key economic driver for the City, adding jobs in health care and construction and increasing economic activity citywide.

UCSF plays an essential role in San Francisco, as a top-ranked medical center, University of California health sciences campus, and major biotechnology research center. UCSF is also the second-largest employer in San Francisco, after the City itself, and half of its employees are San Francisco residents.

UCSF's aging facilities have not kept pace with the University's renowned status nationwide. Its flagship Moffitt Hospital was designed in the 1940s and opened in the 1950s, and is now unable to meet the growing demand for patient referrals and modern standards of care. Its aging research labs make it more difficult for UCSF to recruit and retain the world-class faculty and students that make UCSF a world-class university and medical center, and which UCSF needs in order to lead cutting edge research to fight diseases like COVID-19.

Over the last two years, UCSF has engaged in an open and transparent process with its neighbors regarding the plan. The Chamber is excited about the benefits that this plan will provide to the City, including: jobs, new housing, transportation enhancements, and improved access to open space.

The Chamber looks forward to implementation of UCSF's Comprehensive Parnassus Heights plan, and urges your support.

Respectfully,

Jay Cheng
Public Policy Director
San Francisco Chamber of Commerce

SAN FRANCISCO AFRICAN AMERICAN CHAMBER OF COMMERCE

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San Francisco International Airport

November 9, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: UCSF's Comprehensive Parnassus Heights Plan- San Francisco African American Chamber of Commerce

Dear University of California Board of Regents,

I write to you to convey the San Francisco African American Chamber of Commerce's enthusiastic support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

UCSF is a powerful contributor within San Francisco's economic and social landscape. As a top job creator and the second largest employer in the City and County, UCSF contributes to San Francisco's energy and "innovation ecosystem," attracting world-class talent to live, work, and study.

As San Francisco recovers from the economic toll of COVID-19, UCSF's thirty-year plan will be a key economic driver in rebuilding our workforce. New jobs will be created over the course of redeveloping the Parnassus Heights campus, including an estimated 1,200-1,400 labor jobs through construction of the new, state-of-the-art hospital and the same amount of permanent positions once the hospital opens.

The CPHP envisions a reinvigorated Parnassus Heights campus that both strengthens the neighborhood's economic and cultural vitality and allows UCSF to deliver world-class health care and research to San Francisco, the Bay Area, and the global community for decades to come.

The San Francisco African American Chamber of Commerce looks forward to collaborating with UCSF on this transformative effort. On behalf of the San Francisco African American Chamber of Commerce, I urge you to support the Comprehensive Parnassus Heights Plan.

Sincerely,

Frederick Jordan
Frederick Jordan (Nov 12, 2020 15:24 PST)

Frederick Jordan, Chairman
San Francisco African American Chamber of Commerce

1485 Bayshore Boulevard, Suite 427 ◊ Mailing: Box 158 ◊ San Francisco, CA 94124 ◊ Phone: 415-749-6400 ◊ www.sfaacc.org
Office E-mail: admin@sfaacc.org

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SAN FRANCISCO HCCSF
Hispanic Chambers of Commerce of San Francisco
Cámaras de Comercio Hispanas de San Francisco

NICARAGUAN AMERICAN CHAMBER OF COMMERCE NORTHERN CALIFORNIA

September 24, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street
12th Floor, Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: UCSF's Comprehensive Parnassus Heights Plan- Hispanic Chambers of Commerce

Dear University of California Board of Regents,

I write to you to convey the Board of Directors of the Hispanic Chambers of Commerce of San Francisco's enthusiastic support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

UCSF is a powerful contributor within San Francisco's economic and social landscape. As a top job creator and the second largest employer in the City and County, UCSF contributes to San Francisco's energy and "innovation ecosystem," attracting world-class talent to live, work, and study.

As San Francisco recovers from the economic toll of COVID-19, UCSF's thirty-year plan will be a key economic driver in rebuilding our workforce. New jobs will be created over the course of redeveloping the Parnassus Heights campus, including an estimated 1,200-1,400 labor jobs through construction of the new, state-of-the-art hospital and the same number of permanent positions once the hospital opens.

The CPHP envisions a reinvigorated Parnassus Heights campus that both strengthens the neighborhood's economic and cultural vitality and allows UCSF to deliver world-class health care and research to San Francisco, the Bay Area, and the global community for decades to come.

On behalf of the Hispanic Chamber of Commerce of San Francisco, we urge you to support the Comprehensive Parnassus Heights Plan.

Sincerely yours;

Carlos Solórzano-Cuadra
CEO
Hispanic Chambers of Commerce
Of San Francisco (HCCSF)
Office: 415.735.6120
E mail: carlos@hccsf.com

CHINESE CHAMBER OF COMMERCE

730 Sacramento Street, San Francisco, CA 94108

(415) 982-3000
Fax: (415) 982-4720

September 20, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents 1111 Franklin St.,12th floor
Oakland, CA 94607
via email to regentsoffice@ucop.edu

Re: Chinese Chamber of Commerce Endorsement of UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents:

On behalf of the San Francisco Chinese Chamber of Commerce, I am pleased to **support the UCSF Comprehensive Parnassus Heights Plan.** As San Francisco recovers from the COVID-19 pandemic and re-opens its economy, this 30-year project will be a key economic driver for the City, adding jobs in health care and construction and increasing economic activity citywide.

UCSF plays an essential role in San Francisco, as a top-ranked medical center, University of California health sciences campus, and major biotechnology research center. UCSF is also the second-largest employer in San Francisco, after the City itself, and half of its employees are San Francisco residents.

UCSF's aging facilities have not kept pace with the University's renowned status nationwide. Its flagship Moffitt Hospital was designed in the 1940s and opened in the 1950s, and is now unable to meet the growing demand for patient referrals and modern standards of care. Its aging research labs make it more difficult for UCSF to recruit and retain the world-class faculty and students that make UCSF a world-class university and medical center, and which UCSF needs in order to lead cutting edge research to fight diseases like COVID-19.

Over the last two years, UCSF has engaged in an open and transparent process with its neighbors regarding the plan. The Chinese Chamber is excited about the benefits that this plan will provide to the City, including: jobs, new housing, transportation enhancements, and improved access to open space.

The Chinese Chamber looks forward to implementation of UCSF's Comprehensive Parnassus Heights plan, and urges your support.

Respectfully,

Eddie Au, President
San Francisco Chinese Chamber of Commerce

San Francisco Filipino American Chamber of Commerce

www.sffilamchamber.org

October 1, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: UCSF's Comprehensive Parnassus Heights Plan- San Francisco Filipino American Chamber of Commerce

Dear University of California Board of Regents,

I write to you to convey the San Francisco Filipino American Chamber of Commerce's enthusiastic support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

UCSF is a powerful contributor within San Francisco's economic and social landscape. As a top job creator and the second largest employer in the City and County, UCSF contributes to San Francisco's energy and "innovation ecosystem," attracting world-class talent to live, work, and study.

As San Francisco recovers from the economic toll of COVID-19, UCSF's thirty-year plan will be a key economic driver in rebuilding our workforce. New jobs will be created over the course of redeveloping the Parnassus Heights campus, including an estimated 1,200-1,400 labor jobs through construction of the new, state-of-the-art hospital and the same amount of permanent positions once the hospital opens.

The CPHP envisions a reinvigorated Parnassus Heights campus that both, strengthens the neighborhood's economic and cultural vitality through enhanced retail and amenities, and allows UCSF to deliver world-class health care and research to San Francisco, the Bay Area, and the global community for decades to come.

The San Francisco Filipino American Chamber of Commerce looks forward to collaborating with UCSF on this transformative effort. On behalf of the San Francisco Filipino American Chamber of Commerce, I urge you to support the Comprehensive Parnassus Heights Plan.

Sincerely,

Jose Pecho President
San Francisco Filipino American
Chamber of Commerce
jose@sffilamchamber.org

November 16, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: SF Bike Coalition Support for UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents,

On behalf of the San Francisco Bicycle Coalition, I am writing to express strong support for the Comprehensive Parnassus Heights Plan (CPHP) at the University of California, San Francisco (UCSF).

UCSF's flagship campus was established at Parnassus Heights over 150 years ago and is in critical need of revitalization. As the COVID-19 pandemic has shown, we need to invest in our local hospitals, specifically their need for additional beds and technological improvements to serve increased patient demand. We've also seen how we need to critically reevaluate the ways we navigate our dense, urban areas and create a shift in modality away from single-occupancy vehicles.

The CPHP envisions a Parnassus Heights campus with improved medical and research facilities, including building a new hospital to meet state seismic requirements, while strengthening neighborhood mobility through critical transportation and safety improvements. In particular, we are enthusiastic about the opportunity to improve the bicycle network between Golden Gate Park and the Parnassus Heights campus to serve all bicyclists in the neighborhood.

UCSF engaged in a thoughtful, two-year, collaborative process with neighbors to develop a list of proposed community investments to be made throughout the life of the plan. Their proposed mobility investments include expanding bicycle routes to and through the campus, working with the City to increase capacity and reliability of Muni lines serving the Parnassus Heights campus, and connecting Golden Gate Park and Mount Sutro with greater access paths, all of which will lead to a safer and more livable community for the surrounding neighbors and staff. We look forward to further collaborating on these investments alongside UCSF staff.

I strongly urge you to support UCSF's plans to revitalize their campus, making it a safer place to live, bike, work, and walk. We look forward to partnering with UCSF in implementation of the CPHP.

Sincerely,
Kristen Leckie
Senior Community Organizer
San Francisco Bicycle Coalition

San Francisco
HOUSING
ACTION
COALITION

95 Brady Street
San Francisco, CA 94103
415 541 9001
info@sfhac.org
www.sfhac.org

December 14, 2020
University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin St.,12th floor
Oakland, CA 94607

via email to regentsoffice@ucop.edu

RE: San Francisco Housing Action Coalition Endorsement of UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents:

On November 13, 2020 UCSF presented its Comprehensive Parnassus Heights Plan to the Regulatory Committee of the San Francisco Housing Action Coalition (SFHAC) for review and consideration. **SFHAC is proud to endorse UCSF's Comprehensive Parnassus Heights Plan (CPHP).**

SFHAC is a member-supported nonprofit that advocates for building new well-designed, well-located housing at all levels of affordability. For over 20 years, SFHAC's alliance of businesses, organizations, and individuals have been working together to support smart housing policy, transit-oriented development, and creative solutions for the diverse housing needs of San Francisco's current and future residents. We were founded on the conviction that together we can build the city and neighborhoods we all imagine.

SFHAC supports UCSF's vision to utilize their Parnassus Heights Campus plan as an opportunity to make much-needed improvements to both the surrounding neighborhoods and the city as a whole through housing, transit, open space, and workforce development. Driven by UCSF's need to modernize its medical and research facilities and meet the state's 2030 Hospital Seismic Safety requirements, the CPHP proposes to increase the site's capacity by 2.04 million gross square feet, bringing the campus to 5.96 million square feet at full build-out.

We understand the need to replace and renovate the medical, clinical, and research facilities to avoid obsolescence, meet seismic code upgrade requirements, and maintain

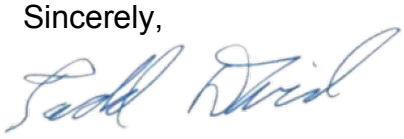
Parnassus Heights' stature as a world-class medical and research hub. SFHAC affirms that the Comprehensive Parnassus Heights Plan:

- **Is situated at an appropriate location for development**, near transit and infrastructure. The Parnassus Heights campus is located on the N Judah Muni line and near other frequent transit options such as buses and University-run shuttles. The Parnassus Heights neighborhood is where UCSF was created more than 120 years ago and where many UCSF employees and students live today.
- **Utilizes smart urban planning to minimize the impact of CPHP development** on the community, particularly in the areas of the new hospital's design, transportation, housing, and construction. We appreciate UCSF and the City's shared commitment to addressing potential challenges by increasing on-campus housing options, mitigating traffic, and exploring ways to lower the on-campus population such as through employee work-from-home solutions. UCSF has shared that they already have the lowest drive-alone rate of any UC campus.
- **Addresses critical healthcare needs** by building a new hospital. UCSF's Moffitt Hospital was built in 1955. Technology and space usage has changed significantly since that time. A new hospital at the Langley Porter Psychiatric Institute site will update the aging infrastructure while also increasing patient capacity by bringing the total number of beds to 675 to meet the growing demand in San Francisco. The new hospital will also feature private patient rooms which are vital for infection control.
- **Is responsive to housing demand in San Francisco** by providing an additional 762 net new units of faculty, student/trainee, and workforce housing, and bringing a total 1,263 net new units. The plan contributes to the diversity of the city's housing stock, fosters economic development, and provides critical amenities and services to the surrounding community. More on-campus housing also reduces transportation demand and bolsters the local economy.
- **Will stimulate the local economy** by providing thousands of construction jobs during the implementation of the plan as well as over 4,000 permanent positions. The New Hospital will be a substantial job generator and will create 1,200 to 1,400 new permanent positions to service the additional beds. In 2011, UCSF voluntarily adopted a local hiring goal that mirrors the standards modeled by the San Francisco Board of Supervisors' Local Ordinance for projects with a contract value of $5 million and above.
- **Creates an enjoyable environment for residents and contributes to a walkable environment** with conceptual changes proposed in the campus plan such as improvements to the Irving Street entry, a "main street" pedestrian focus, and streetscape improvements on Parnassus Avenue. We also support the restoration of Fourth Avenue to the city grid and the "Park to Peak" connections

through campus that make the Mount Sutro Open Space Reserve further accessible to the public.

Given all of the above, we support UCSF's land use planning, including increased density at this infill location, and we appreciate the University's efforts to engage the community. Recognizing that this is an early stage of planning, we look forward to final commitments regarding public realm concepts and other community benefits, as well as future designs of the buildings proposed in the plan.

Sincerely,



Todd David, Executive Director

December 1, 2020
University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin St., 12th floor
Oakland, CA 94607

Via email to regentsoffice@ucop.edu

RE: SF YIMBY Support for the UCSF Comprehensive Parnassus Heights Plan (CPHP)

Dear University of California Board of Regents:

On November 10, 2020, UCSF presented its Comprehensive Parnassus Heights Plan to SF YIMBY. Having taken into consideration the presentation, vision and scope of this project, SF YIMBY is pleased to support the **UCSF Comprehensive Parnassus Heights Plan (CPHP).**

SF YIMBY is a network of grassroots pro-housing activists advocating for more inclusive housing policies in San Francisco. We drive policy change to increase the supply of housing at all levels of affordability to bring down the cost of living in opportunity-rich cities and towns. We envision an integrated society where every person has access to a safe, affordable home near jobs, services and opportunity.

UCSF demonstrated the need to modernize its medical and research facilities in order to meet California's 2030 Hospital Seismic Safety requirements and maintain its reputation as a world-class medical and research hub. CPHP proposes to increase the site's capacity by 2.04 million gross square feet, bringing the campus to 5.96 million square feet upon full build-out. The plan proposes 762 net new units of faculty and student/trainee housing, bringing the total to 984 units. Additionally, UCSF plans to expand upon housing investments at other UC sites across the city, for a total portfolio of 1,163 new units.

We commend UCSF for re-imagining its campus to better meet the healthcare needs of tomorrow in a way that provides desperately needed housing for its students, staff and faculty. The plan is an extraordinary commitment on behalf of the university to uphold its legacy of being a beloved neighbor. We understand the project is in the early stages of planning, look forward to collaborating with UCSF to finalize its commitments to community benefits, and eagerly anticipate reviewing future designs of the specific buildings proposed in the plan.

Cordially,

SF YIMBY

December 1, 2020
University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin St., 12th floor
Oakland, CA 94607

Via email to regentsoffice@ucop.edu

RE: HAND's Support for the UCSF Comprehensive Parnassus Heights Plan (CPHP)

Dear University of California Board of Regents:

On November 10, 2020, UCSF presented its Comprehensive Parnassus Heights Plan to the Haight-Ashbury Neighbors for Density (HAND). Having taken into consideration the presentation, vision and scope of this project, HAND is pleased to support the **UCSF Comprehensive Parnassus Heights Plan (CPHP).**

HAND is the Haight-Ashbury and District 5 neighborhood affiliate of San Francisco YIMBY. SF YIMBY is a network of grassroots pro-housing activists advocating for more inclusive housing policies in San Francisco. We drive policy change to increase the supply of housing at all levels of affordability to bring down the cost of living in opportunity-rich cities and towns. We envision an integrated society where every person has access to a safe, affordable home near jobs, services and opportunity.

UCSF demonstrated the need to modernize its medical and research facilities in order to meet California's 2030 Hospital Seismic Safety requirements and maintain its reputation as a world-class medical and research hub. CPHP proposes to increase the site's capacity by 2.04 million gross square feet, bringing the campus to 5.96 million square feet upon full build-out. The plan proposes 762 net new units of faculty and student/trainee housing, bringing the total to 984 units. Additionally, UCSF plans to expand upon housing investments at other UC sites across the city, for a total portfolio of 1,163 new units.

We commend UCSF for re-imagining its campus to better meet the healthcare needs of tomorrow in a way that provides desperately needed housing for its students, staff and faculty. The plan is an extraordinary commitment on behalf of the university to uphold its legacy of being a beloved neighbor. We understand the project is in the early stages of planning, look forward to collaborating with UCSF to finalize its commitments to community benefits, and eagerly anticipate reviewing future designs of the specific buildings proposed in the plan.

Cordially,

The Haight-Ashbury Neighbors for Density

San Francisco Westside Transportation and Accessibility Coalition

SFWTAC

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin St., 12th floor
Oakland, CA 94607

RE: SFWTAC Endorsement of UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents:

The San Francisco Westside Transportation and Accessibility Coalition (SFWTAC) is writing to express our support for the UCSF Parnassus Heights Plan.

SFWTAC is an organically unified group, established in October 2019. Together, we are comprised of merchant groups, disability rights activists, first responders, neighborhood organizations, and neighbors with a common goal of equity to access for all. All members align with the mission of bringing safe, equitable, and reliable transportation to the west side of San Francisco. The Coalition engages with stakeholders and elected officials to inform and advocate our approach.

UCSF presented its Comprehensive Parnassus Heights Plan (CPHP) to SFWTAC on July 15, 2020. Driven by UCSF's need to modernize UCSF's medical and research facilities and meet the state's 2030 Hospital Seismic Safety requirements, the Comprehensive Plan proposes to increase the site's capacity and add 762 net new units of faculty and student/trainee housing. Most importantly, UCSF's planning team has thought deeply about how to improve arrival, via all modes of transport, to campus, is looking at how to address larger mobility challenges by partnering with SFMTA, and is exploring the safety and greening improvements at the difficult intersection of Irving/Carl/Arguello. UCSF has worked to study their surrounding area to learn about the transportation needs of their visitors and neighbors. SFWTAC hopes to capitalize on the UCSF traffic study and expand it to the entire west side of San Francisco to provide comprehensive data to help inform policy decisions.

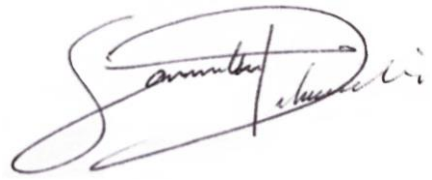
SFWTAC supports the June 2020 UCSF Comprehensive Parnassus Heights Plan because it brings the potential to enhance the transportation of the west side of San Francisco. We look forward to continuing an open dialogue with UCSF as the CPHP develops. Moving forward, UCSF and WTAC will fight to bring more equitable and reliable transportation to the west side.

Thank you for your time and consideration of this letter. Please direct any inquiries for the SFWTAC to sfwtac@gmail.com.

San Francisco Westside Transportation and Accessibility Coalition

SFWTAC

Sincerely,



Samantha Delucchi
Coalition Secretary
San Francisco Westside Transportation and Accessibility Coalition

SF Urban Riders
Promoting Offroad Cycling in San Francisco

December 23, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: San Francisco Urban Riders Support for UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents,

The San Francisco Urban Riders are excited to share our support for the Comprehensive Parnassus Heights Plan (CPHP) at the University of California, San Francisco (UCSF).

UCSF's flagship campus was established at Parnassus Heights over 150 years ago and is in critical need of revitalization. The COVID-19 pandemic has highlighted the need to invest in our local hospitals and that access to open space is a public health necessity. UCSF's Mount Sutro Open Space Reserve is a unique aspect of their campus as it is a 61 acre preserve adjoining their campus that residents throughout San Francisco utilize.

As the COVID-19 pandemic has illustrated, access to nature and the outdoors is an essential public health need. The San Francisco Urban Riders are proud to be partners with a leader in healthcare during this crisis to expand access to this area. We are pleased that the plan prioritizes nature and green space and thoughtfully incorporates the surrounding open space, including Mount Sutro, for the benefit of patients, staff, and visitors, alike.

We applaud UCSF's commitment to maintaining Mount Sutro for public use and the intentional incorporation of this treasured place into the long-term vision for the revitalized campus. We also support the planned increase of open space on campus, more than doubling what exists today (exclusive of the Reserve) and greater community access to Mount Sutro. The CPHP's "Park to Peak" design concept opens up the campus, which is situated between Golden Gate Park and Mount Sutro, through the coordination of planned trailheads at Mount Sutro, improved landscaping, and an enhanced connection between these two parks. In particular, we are enthusiastic about the opportunity to improve the bicycle network and trails, and the continued stewardship of the Mount Sutro Open Space Reserve and support for the Sutro Stewards programs.

UCSF engaged in a thoughtful, two-year, collaborative process with neighbors to develop a list of proposed community investments to be made through the life of the plan.
I strongly urge you to support UCSF's plans to revitalize their campus, making it a safer place to live, bike, work, and walk. The San Francisco Urban Riders are looking forward to partnering with UCSF in implementation of the CPHP.

Sincerely,

Matthew Blain
Chair, San Francisco Urban Riders

Hospital Council
Northern & Central California

October 12, 2020

2020 University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin St., 12th floor
Oakland, CA 94607

via email to regentsoffice@ucop.edu

RE: Hospital Council Endorsement of UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents:

The San Francisco Section of the Hospital Council Northern & Central California is comprised of the CEOs representing the public and private hospitals across the city. On behalf of the Section, I write to express our strong support of UCSF's *Comprehensive Parnassus Heights Plan* (Plan). We appreciate UCSF's efforts to share information with our members about the Plan, as well as its on-going, broader community engagement.

As the COVID-19 pandemic illustrates, hospitals must be prepared to meet the ever-changing and expansive needs of the communities each serves. While UCSF currently provides excellent care to both San Francisco and Marin Counties, it must both modernize medical and research facilities and meet the state's stringent 2030 Hospital Seismic Safety requirements. We support the Plan as it proposes to increase the site's capacity while improving the medical, clinical and research resources that solidifies Parnassus Heights as a world-class medical center and campus.

Notably, in addition to its essential role in San Francisco as a top-ranked medical center, UCSF is also the second-largest employer in San Francisco (after the City itself). As San Francisco reopens and recovers from the enormous economic impacts of the COVID-19 pandemic, this project will be an important economic driver, providing jobs in healthcare and construction and increasing economic activity across the city.

The Section is pleased to support the proposed Comprehensive Parnassus Heights Plan. We look forward to continued engagement with the team at UCSF so that we may provide the feedback of Council members as the Campus Redevelopment evolves.

Sincerely,

David Klein, MD, MBA
Chair, San Francisco Section, Hospital Council Northern & Central California

Regional Office 235 Montgomery Street, Suite 910 San Francisco, CA 94104-3004 415.616.9990 Fax: 415.616.9992

SAN FRANCISCO MARIN MEDICAL SOCIETY

August 12, 2020

2020 University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin St., 12th floor
Oakland, CA 94607

via email to regentsoffice@ucop.edu

RE: SFMMS Endorsement of UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents:

The San Francisco Marin Medical Society (SFMMS) represents over 3000 physicians across all medical specialties and phases of their careers in San Francisco and Marin Counties. We appreciate the UCSF team presenting its *Comprehensive Parnassus Heights Plan Vision* to the SFMMS Executive Committee in June 2020 for its review and consideration, and the extent of community consultation undertaken.

The SFMMS Executive Committee discussed the plan during its meeting of August 2020, with attention paid to the increased capacity to serve patients that redevelopment of the Parnassus Heights Campus would provide. It is our belief that this redevelopment is necessary if the physician community that we represent is to continue to provide excellent care to San Francisco and Marin Counties. Driven by UCSF's need to modernize UCSF's medical and research facilities and meet the state's 2030 Hospital Seismic Safety requirements, the *Comprehensive Plan* proposes to increase the site's capacity while replacing and renovating the medical, clinical and research facilities to avoid obsolescence and maintain Parnassus Heights' stature as a world-class medical and research facility. We believe the planned enhancements to the only health-focused academic medical center and campus within the University of California system will continue to attract the world's best physicians to San Francisco.

SFMMS is pleased to support the proposed *Comprehensive Parnassus Heights Plan Vision*. We encourage the team at UCSF to continue to work with SFMMS as needed and via its Executive Committee so that we may provide the feedback of our members during future planning and execution of the Campus Redevelopment.

We look forward to our continued collaboration.

Sincerely,



Brian Grady, M.D.
President, San Francisco Marin Medical Society

2720 Taylor Street, Suite 450, San Francisco, CA 94133 • www.sfmms.org • P 415.561.0850 • F 415.561.0833

December 17, 2020

To the University of California Regents:

The California Life Sciences Association is pleased to support the UCSF Comprehensive Parnassus Heights Plan. CLSA is the largest statewide life sciences public policy and business leadership organization in the state, and we have been advocating for sound public policy on this issue for nearly a decade. Our mission is to advance California's world-leading life sciences innovation ecosystem by advocating for effective national, state, and local public policies and supporting entrepreneurs and life science business.

As you know, the Bay Area is a hotbed for innovation. The region boasts one of the most robust biomedical hubs in the world and supports 27% of California's life sciences jobs. In San Francisco alone there are close to 40 companies, from small incubators to large facilities like FibroGen, Bristol Meyers Squibb, and Nektar who work to bring new therapies to the market to help fight COVID-19, cancer, kidney disease, blindness, and HIV. To that end, UCSF plays an essential role in the life science ecosystem as a top-ranked medical center, University of California health sciences campus, and major biotechnology research center. Numerous biotechnology companies have been created because of biotechnology research pioneered at UCSF.

UCSF's aging facilities have not kept pace with the University's renowned status nationwide. Its flagship Moffitt Hospital was designed in the 1940s and opened in the 1950s and is now unable to meet the growing demand for patient referrals and modern standards of care. Its aging research labs make it more difficult for UCSF to recruit and retain the world-class faculty and students that make UCSF a world-class university and medical center, and which UCSF needs in order to lead cutting edge research to fight diseases like COVID-19.

To that end, CLSA believes that UCSF's Comprehensive Parnassus Heights Plan is key to maintaining California's leadership in biotechnology research and urges your support.

Sincerely,



Mike Guerra
President & CEO | California Life Sciences Association (CLSA)
The Premier Life Sciences Trade Association for California

SAN FRANCISCO BAY AREA PHYSICIAN ASSISTANTS

STEERING COMMITTEE:

Martin Kramer, PA-C
Jennifer Nossokoff, PA-C
Kurtis Opp, PA-C
Nais Raulet, PA-C
Lisa Spitalewitz, PA-C
Carl Stein, MHS, PA-C

December 10, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: Physician Assistants in Support of UCSF's Comprehensive Parnassus Heights Plan and New Hospital

Dear University of California Board of Regents,

I am writing today on behalf of the San Francisco Bay Area Physician Assistants (SFBAPA) to express support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

The San Francisco Bay Area Physician Assistants represents over 700 physician assistants in and around San Francisco. We help our members stay current on medical knowledge and practice regulations and continue to grow the profession to meet the rising demand for physician assistants.

We appreciate that as UCSF is reimagining its oldest campus to meet the health-care needs of tomorrow, it remains committed to strengthen the economic and cultural vitality of the surrounding neighborhood.

UCSF's facilities at Parnassus Heights are outdated, inflexible, undersized and clinically obsolete – and the future UCSF Helen Diller Medical Center at Parnassus Heights is an integral part of the CPHP. Building a facility that fosters the bench to bedside connection between UCSF's leading educational programs and world-renowned researchers will enhance health
care and accelerate discovery. The increase in new hospital beds from 475 to 675 is crucial to meet the needs of a growing and aging Bay Area population.

The campus improvements and new hospital will continue to attract talented physician assistants to San Francisco, and are critical for the physician assistant community to continue to provide excellent care to San Francisco. Ensuring the new hospital is modern and flexible will support our physician assistants as well as advance patient health throughout the Bay Area.

The San Francisco Bay Area Physician Assistants is in strong support of UCSF's plans to revitalize Parnassus Heights and build a new hospital, which will allow us to continue advancing health care throughout San Francisco together.

Sincerely,

Martin Kramer PA-C
Martin Kramer PA-C (Dec 9, 2020 18:00 PST)

Martin Kramer, PA-C
Chair, San Francisco Bay Area Physician Assistants Steering Committee

california **pharmacists** association

November 24, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: Support for UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents,

I am writing today on behalf of the California Pharmacists Association to express support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

The California Pharmacists Association (CPhA) was founded in 1869 and is the largest state association representing pharmacists. CPhA represents pharmacists, technicians and student pharmacists from all practice settings. These practice settings include community pharmacy (both independent owners and employees working in chain drug stores), hospitals & health-systems, and specialty practices such as compounding, managed care, and long term care.

UCSF has been an anchor institution in the San Francisco Bay Area for over a century and is a major contributor to the health and well-being of the community. Home to nationally ranked professional health science schools, cutting edge research, and high-quality patient care, Parnassus Heights is UCSF's original campus and in need of investment.

While UCSF is an acclaimed academic medical center, the facilities at Parnassus Heights do not match the quality of health sciences within. UCSF's Moffitt Hospital was built in 1955 and cannot accommodate advancements in medical equipment and technology. A 21st century state-of-the art pharmacy is critical to retaining and recruiting top clinicians, staff, researchers and students and is necessary to sustaining UCSF's public mission of top-quality patient care, research and education.

The future UCSF Helen Diller Medical Center at Parnassus Heights is an integral part of the CPHP. The new hospital at Parnassus Heights plans to increase the square footage of the main and the operating room pharmacies to accommodate growth commensurate with a larger hospital. The future hospital will also allow the pharmacy to be in closer proximity to patients and the operating rooms so medications can be more readily distributed to critical areas. More collaborative spaces envisioned within the new hospital will allow for focused discussions regarding plan of care, timely decisions and teaching opportunities for our future pharmacists.

With the current patient census at record highs, it is essential for UCSF to expand access to accommodate increasing patient demand. The new hospital will increase UCSF's capacity by 42% to keep pace with the increase and aging population and growing need for complex care.

To ensure UCSF can continue to advance health in partnership with the California Pharmacists Association, I urge you to support UCSF's plans to revitalize their flagship campus and build a new hospital.

Sincerely,

Susan A. Bonilla

Susan Bonilla, MEd
Chief Executive Officer and Secretary of the Board of Trustees,
California Pharmacists Association

Golden-Gate Chapter of Health-System Pharmacists
821 Irving St #225072
San Francisco, CA 94122
http://cshpgoldengate.org

2019 CSHP
Chapter of Distinction

November 20, 2020

University of California Board of Regents
Office of the Secretary and Chief of Staff to the Regents
1111 Franklin Street, 12th Floor
Oakland, CA 94607
via email: regentsoffice@ucop.edu

Re: Support for UCSF's Comprehensive Parnassus Heights Plan

Dear University of California Board of Regents,

The Golden Gate Society of Health-System Pharmacists Board is in full support for the University of California, San Francisco's Comprehensive Parnassus Heights Plan (CPHP).

UCSF's facilities at Parnassus Heights are outdated, inflexible, undersized and clinically obsolete. State seismic laws call for Moffitt Hospital to be structurally retrofitted or decommissioned as an inpatient facility by 2030. The future UCSF Helen Diller Medical Center at Parnassus Heights is an integral part of the CPHP. While UCSF is an acclaimed academic medical center, the facilities at Parnassus Heights do not match the quality of health sciences within. UCSF's Moffitt Hospital was built in 1955 and cannot accommodate 21st century advances in medical equipment and technology.

With the current patient census at record highs, it is essential that UCSF expands access to accommodate increasing patient demand. The new hospital at Parnassus Heights will increase UCSF's capacity by 42% to keep pace with the increase and aging population and growing need for complex care – increasing the number of beds from 475 to 675.

A 21st century state-of-the art pharmacy is critical to retaining and recruiting top clinicians, staff, researchers and students and is necessary to sustaining UCSF's public mission of top-quality patient care, research and education. The new hospital at Parnassus Heights plans to increase the square footage of the main and the operating room pharmacies to accommodate growth commensurate with a larger hospital. The future hospital will also allow the pharmacy to be in closer proximity to patients and the operating rooms so medications can be more readily distributed to critical areas. More collaborative spaces envisioned within the new hospital will allow for focused discussions regarding plan of care, timely decisions and teaching opportunities for our future pharmacists.

To ensure UCSF can continue to advance health in partnership with the Golden Gate Society of Health-System Pharmacists, I urge you to support UCSF's plans to revitalize their flagship campus and build a new hospital.

Sincerely,

Sylvia Stoffella , PharmD
President, Golden Gate Society of Health-System Pharmacists

Alumni Association of UCSF
UCSF Box 0970
San Francisco, CA 94143
www.ucsf.edu
alumni.ucsf.edu

UCSF Alumni

June 1, 2020

AAUCSF Supports the Comprehensive Parnassus Heights Plan

The Board of Directors of the Alumni Association of UCSF emphatically supports the Comprehensive Parnassus Heights Plan. This long-term planning project prioritizes community engagement in order to envision a 21st century educational and clinical health science campus. The new design of the Parnassus Campus aims to create an environment that is more welcoming, navigable, and accessible to the campus and local communities alike. The plan also brings the campus up to the latest seismic codes.

For over 100 years Parnassus Heights has been a vital academic healthcare partner for San Franciscans as a whole. From assisting thousands of San Franciscans following the 1906 earthquake to the present COVID-19 pandemic, UCSF remains committed to the health of those both at home and afar.

The Comprehensive Parnassus Heights Plan will allow future UCSF students to receive top-tier training in facilities promoting interdisciplinary collaboration and highly specialized care in order to further the UCSF mission of *advancing health worldwide*. We are proud of the 68,000 alumni we represent as they apply UCSF's passion for educating, improving and saving lives, and generating and sharing new knowledge across the country and the world. No matter how long it has been since they last set foot at Parnassus Heights, it remains pivotal in their success as leaders in health care and science.

The Comprehensive Parnassus Heights plan will ensure that generations to come will benefit from and contribute to the legacy of UCSF. From epidemiologic research on vulnerable populations to the latest in minimally invasive neonatal surgery, UCSF is known for passionate researchers and consistent advancement of the biomedical field. As alumni we see the Comprehensive Parnassus Heights Plan as a vital vision for a modernized future of UCSF.

This statement was approved by the AAUCSF Board of Directors on June 2, 2020.

Judith Lamberti

Judith Lamberti, MD '78
President, Alumni Association of UCSF

Member, Board of Supervisors
District 3

AARON PESKIN

City and County of San Francisco

DATE: January 7, 2021

TO: Angela Calvillo
Clerk of the Board of Supervisors

FROM: Supervisor Aaron Peskin, Chair, Land Use and Transportation Committee

RE: Land Use and Transportation Committee
COMMITTEE REPORTS

Pursuant to Board Rule 4.20, as Chair of the Land Use and Transportation Committee, I have deemed the following matters are of an urgent nature and request they be considered by the full Board on Tuesday, January 12, 2021, as Committee Reports:

201370 Interim Zoning Controls - Large Residential Projects in RC, RM and RTO Districts

Resolution imposing interim zoning controls for an 18-month period for parcels in Residential-Commercial Combined (RC), Residential - Mixed (RM) and Residential - Transit Oriented (RTO) districts, requiring Conditional Use Authorization for any residential development that does not maximize the number of units allowed by applicable density restrictions; affirming the Planning Department's determination under the California Environmental Quality Act; and making findings of consistency with the General Plan, and the eight priority policies of Planning Code, Section, 101.1.

[TBD] Urging California Regents to Consider the Proposed UCSF Parnassus Expansion Plan EIR at their March 2021 Meeting

Resolution urging the California Regents to move consideration of the proposed University of California at San Francisco (UCSF) Parnassus Expansion Plan Environmental Impact Report (EIR) from their January 2021 meeting to their March 2021 meeting.

COMMITTEE REPORT MEMORANDUM
Land Use and Transportation Committee

[TBD] Initiating Landmark Designation - 800 Chestnut Street - Diego Rivera Mural "The Making of a Fresco Showing the Building of a City"

Resolution initiating a landmark designation under Article 10 of the Planning Code for Diego Rivera's fresco, titled "The Making of a Fresco Showing the Building of a City," painted in 1931 and located at 800 Chestnut Street.

These matters will be heard in the Land Use and Transportation Committee at a Regular Meeting on Monday, January 11, 2020, at 1:30 p.m.

/s/ Aaron Peskin